Souder, Miller & Associates♦201 S. Halagueno St.♦Carlsbad, NM 88220

June 8, 2023;
revised April 3, 2024

SMA Project No. 5E29549-BG4

Devon Energy Production Company
Mr. Jim Raley
5315 Buena Vista Drive
Carlsbad, NM 88220

SUBJECT: Burial Trench Closure Plan for the Former Reserve Pit at Campana 2M State #001, Eddy County, New Mexico

Dear Mr. Raley:

Souder, Miller & Associates (SMA) has prepared this Closure Plan for the brine impacted soils related to the former reserve pit located at the Campana 2M State #001 site. The reserve pit was installed in the early 2000s as part of drilling for natural gas in the Morrow formation. This former reserve pit was established before the current 19.15.17 New Mexico Administrative Code (NMAC) regulations for *Pits, Closed-Loop Systems, Below Grade Tanks and Sumps* came into effect. As such, the original design and construction of the pit did not adhere to design and construction specifications (19.15.17.11 NMAC).

The former reserve pit is classified as a *burial trench*, therefore, reburial activities will adhere to 19.15.17.11 NMAC Part K, and closure and reclamation activities will adhere to 19.15.17.13 NMAC Parts D and H, respectively. Additionally, reclamation and restoration of the former reserve pit location will adhere to standards set by the New Mexico State Land Office (SLO) and 19.2.10.28 NMAC.

The site located is in Unit M, Section 2, Township 24S, Range 26E, within Eddy County, New Mexico, on State Trust land. Sheets 1 and 2 illustrate the vicinity and site location on a United State Geological Service (USGS) 7.5-minute quadrangle map and aerial photograph, respectively.

Table 1 summarizes information regarding the site.

Table 1: Site Information			
Name	Campana 2M State #001	Operator	Chisholm Energy Production
API Number	30-015-31725	Location	Unit M, Section 2 of Township 24S, Range 26E Eddy County, NM
OGRID	6137 166431	GPS coordinates	32.241337, -104.270502
Land Owner	State Trust	NMOCD Release Closure Criteria (19.15.29.12.C(4) and Table I)	>100 ft
Lease ID	GS11530000	NMOCD Burial Trench Closure Criteria (19.15.17.11.C and Table II)	>100 ft

1.0 Site Information

The Campana 2M State #001 site is an inactive production facility located approximately 7 miles south-southwest of Carlsbad, New Mexico on State Trust land at an elevation of approximately 3,300 feet above mean sea level (amsl). The pad formally used for the operation of the well comprises the southern portion of the site, and the former reserve pit comprises the northern portion of the site. The well head monument marking the plugged and abandoned well is present in the north central portion of the well pad. A tank battery consisting of three above ground tanks with associated berms and fencing is present on the southeast corner of the well pad and a separator is present on the eastern side of the well pad. The well pad is comprised of non-native caliche and the former reserve pit area is presently bare ground.

The site is officially accessed from the dirt road located on the southwest corner of the well pad. There is also an unofficial two-track located on the northeast corner of the well pad that also serves as the buried pipeline right-of-way. A pipeline right-of-way runs adjacent to the well pad on the southeast corner.

Soil for the site and surrounding area is comprised of Reagan loam, a well-drained soil derived from alluvium and/or eolian deposits. It is considered suitable for "farmland of statewide importance". Per a karst survey report, the site is underlain by the Permian Rustler Formation, which is known to contain karst-forming strata, and the Permian Salado Formation, a layer of extremely soluble halite that can dissolve to create karst features. A copy of the *Cave and Karst Resource Inventory Report* by Southwest Geophysical Consulting, LLC, and a *Custom Soil Resource Report* by Natural Resources Conservation Service (NRCS) are included in Appendix C.

1.1 Site History

In April 2001, the location was permitted through NMOCD for drilling a new gas well to approximately 12,000 feet and complete it as a development well in the South Carlsbad (Morrow) pool. The *Application for Permit to Drill* (C-101 Form) included a site drawing that noted equipment, staging, and reserve pit locations. A *Sundry Notice* (C-103) from June 2006 noted that if an earthen pit was to be utilized as part of the site work, a permit must be obtained. However, records of any earthen pit have not been found. In July 2007, the well was completed and successfully producing. In December 2019, the well was plugged and abandoned.

Applicable historical NMOCD and operator records are included in Appendix A. Historical imagery showing the site prior to land disturbance and during well operation is included in Appendix B.

2.0 Siting Criteria / Closure Criteria Determination

2.1 Depth to Groundwater

A search of the New Mexico Office of the State Engineer (NMOSE) New Mexico Water Rights Reporting System (NMWRRS) and the USGS National Water Information System did not yield any results within ½ mile of the site. However, several water wells are located within approximately one-mile of the site including NMOSE registered wells C-02174, C-04051, and C-03414 as illustrated on Sheet 1 and well logs included in Appendix A. Well C-02174 is nearest to the release site, just over ½ mile to the southwest, with a reported depth to groundwater of 233 feet below grade surface (bgs). Similarly, well C-04051 located approximately one-mile to the north of the release site also reports a depth to groundwater of 233 feet bgs. Well C-03414 is located just over one mile to the south-southeast and reports a depth to groundwater of 32 feet bgs. This well is located immediately adjacent to Threemile Draw and appears to be associated with a shallow perched

aquifer within the channel's infill sediments with groundwater influenced by flow within the draw. In contrast to well C-03414, the other well locations appear to be similar in underlying lithology and in topographic terrain to the release site.

The bottom of the burial trench is expected to be no greater than 20 feet bgs. Based on this information and the nearest registered water wells, depth to groundwater is considered to be greater than 25 feet below the bottom of the buried waste.

2.2 Surface Water

According to the NMOSE NMWRRS, USGS National Water Information System, and USEPA's WATERS GeoViewer, there are no known continuously flowing watercourses within 100 feet of the location, and no lakebeds, sinkholes, or playa lakes within 200 feet of the location. The nearest known watercourse is located approximately 5,540 feet north of Threemile Draw, as illustrated on Sheet 2.

2.2 Wellhead Protection Area

According to the NMOSE NMWRRS and the New Mexico Bureau of Geology and Mineral Resources (NMBGMR), no springs, private, or domestic freshwater wells are located within 300 feet of the location. Registered wells in the vicinity are shown on Sheet 1.

2.4 Sensitive Areas

Sheet 1 illustrates the 500 and 1,000-foot and the 0.5-mile radii which indicate that the site does not lie within a sensitive area as described in Paragraphs (1) and (2) of Subsection (C) of 19.15.17.10 NMAC, except for the release location being within an area of high karst potential, as illustrated on Sheet 1 and the *Cave and Karst Resource Inventory Report* by Southwest Geophysical Consulting, LLC. Per the report, one high-likelihood and seven medium-likelihood surface karst features were identified within the aerial survey area; however, there were no surface karst features identified within 200 feet of the site footprint.

The high karst potential is taken into consideration for the design of the burial trench by incorporating engineering and safety measures to ensure the onsite closure method will prevent contamination of fresh water and protect public health and the environment.

Table 2 demonstrates the NMOCD Release Closure Criteria, and Table 3 demonstrates the NMOCD Burial Trench Closure Criteria applicable to this location.

A copy of the *Cave and Karst Resource Inventory Report* by Southwest Geophysical Consulting, LLC is included in Appendix C. The report summarizes the methods of the karst survey, findings, and recommendations.

3.0 Site Characterization

On March 9 and 10, 2021, SMA personnel performed site characterization activities to delineate brine impacted soils related to the former reserve pit at the Campana 2M State #001 site.

3.1 Soil Sampling and Field Screening Activities

SMA collected soil samples from 23 sample locations, TH-1 through TH-23, in the former reserve pit area and areas of interest on the well pad. SMA also collected soil samples from one background sample location, BG-1, east of the site in a natural area that does not appear to be affected by oil and gas operations. Sample locations TH-1 through TH-17 were advanced using a backhoe and the remainder were advanced using a hand auger to the total depths explored. Sample locations are illustrated on Sheet 3.

At each sample location, a soil sample was collected at the ground surface with subsequent samples collected at approximately two-foot intervals to the total depths explored. Selected soil samples were field screened for chloride impacts using an electrical conductivity (EC) meter. Field screening results are summarized in Table 4. A copy of the delineation field notes is included in Appendix D.

3.2 Soil Laboratory Sampling Activities

Samples were selected for laboratory analysis based on field screening results and visual/olfactory observations and were collected according to the sampling protocol included in Appendix E. A total of 20 samples were collected for laboratory analysis for chloride using EPA Method 300.0. Two of the samples were also analyzed for total petroleum hydrocarbons (TPH) as motor, diesel, and gasoline range organics (MRO, DRO, and GRO) by EPA Method 8015D. Laboratory samples were placed into laboratory supplied containers and maintained on ice until delivery under chain of custody to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico.

3.3 Field Screening and Laboratory Analytical Results

Electrical conductivity field screening results ranged from 0.13 millisiemens per centimeter (mS/cm) to greater than 20 mS/cm, the maximum range of the meter. Laboratory analytical results for chlorides ranged from 150 milligrams per kilogram (mg/kg) to 27,000 mg/kg. Laboratory results for TPH were below laboratory detection limits for the GRO, DRO, and MRO fractions in the two samples analyzed. Laboratory results also indicated the presence of natural chlorides in the area soils with a concentration of 250 mg/kg present in sample BG-1 at 2 feet bgs.

Field screening results and laboratory analytical results are summarized in Table 4 and illustrated on Sheet 3. The laboratory analytical report is included in Appendix F. Results were compared to the Closure Criteria levels in Table I of 19.15.29.12 NMAC.

3.4 Findings

Based on onsite observations, field screening results, and laboratory results, an area of approximately 63,300 square feet focused on the former reserve pit location appears to be impacted by chlorides above the concentration of 600 mg/kg. Sample locations TH-2, TH-4, TH-13, and TH-23 appear to define the horizontal extent of impact to the northwest, and sample locations TH-19 and TH-20 appear to define the extent to the southwest.

The observed vertical extents of chloride impact range from estimated depths of 1 to 5 feet near the perimeter of the impacted area to 6 to 12 feet in depth near the center of the impacted area. The estimated horizontal extents of the impacted area are illustrated on Sheet 4.

4.0 Reserve Pit Closure Plan Scope

SMA proposes excavation and reburial of the impacted soils associated with the former reserve pit. Approximately 12,900 cubic yards of impacted soil is proposed to be reburied within a geomembrane liner and covered burial trench, then covered with four feet of backfill material.

Prior to remediation and reclamation activities, a SLO Right of Entry permit will be completed, compliance with the Cultural Properties Protection Rule (19.2.24 NMAC) will be documented, and compliance with any applicable wildlife or biological rules will also be documented. A notice will be given to SLO no less than two business days before remediation and reclamation activities begin.

Per the *Cave and Karst Resource Inventory Report*, caution should be exercised while clearing brush and excavating activities, and employing an onsite representative from Bureau of Land Management (BLM) for karst monitoring is recommended. **It is considered necessary to conduct a geophysical survey at the site to determine if subsurface karst development exists**.

Remaining equipment including the tanks, separator, and associated piping will be properly abandoned and removed from the location. The impacted area will be excavated with impacted spoils stockpiled on plastic liner onsite. The impacted area will be excavated until confirmation samples meet the Closure Criteria of Table I of 19.15.29.12 NMAC.

5.0 Closure for Waste

The waste imported to the burial trench will be closed in accordance with Subsection D of 19.15.17.13 NMAC. These measures and site application are described below:

Measure (Subsection D of 19.15.17.13 NMAC)	Application
NMOCD Approval: The operator shall not commence closure without first obtaining approval of the closure plan submitted with the permit application.	Impacted soils were delineated in March 2021, and closure of the former reserve pit was proposed in the Revised Remediation Plan, dated December 28, 2022. This Closure Plan shall obtain approval from NMOCD and SLO prior to beginning closure of the former reserve pit.
Siting Criteria: The operator shall demonstrate and comply with the siting criteria set forth in Subsection C of 19.15.17.10 NMAC.	Refer to Section 2 and Table 3 for NMOCD Burial Trench Closure Criteria. A variance is requested for the high karst designation. To account for the high karst area with potential for unstable geologic conditions: (1) An engineer, geologist, or other qualified professional will inspect the bottom of the burial trench prior to the liner installation for signs of cavities, sinkholes, and ground settling. Should those conditions exist, additional excavation will occur which will allow space for placement of (clean) soil

	backfill to stabilize the bottom of the burial trench. (2) The liner material will be a 30-mil thick, scrim reinforced linear low-density polyethylene (Dura-Skrim N30B or equal) (RPE) that can conform to changes in base conditions. Should minor settling occur, the significantly elastic property of the RPE liner will conform without damaging the integrity of the liner.
Removal of Free Liquids: Prior to closure, the operator shall remove all free liquids reasonably achievable from the pit and dispose of such liquids at a division approved facility.	Though not anticipated, any free liquids from the pit will be removed and disposed at an approved waste facility.
Waste contents: When closing a temporary pit, the operator shall stabilize or solidify the remaining temporary pit contents to a capacity sufficient to support the final cover of the temporary pit. When transferring waste contents into a burial trench, the operator shall stabilize or solidify the waste contents to a capacity sufficient to support the final cover of the burial trench. The operator shall not mix soil with waste material at a ratio greater than 3:1. Waste mixture must pass the paint filter liquids test (EPA Method SW-846, Method 9095 or equivalent).	The impacted area will be excavated until remaining sidewalls and base confirmation samples meet the Closure Criteria of Table I of 19.15.29.12 NMAC. See attached Table 2. Samples will be collected using a backhoe with bucket, or similar means. Personnel are not allowed inside the excavation to collect samples unless approved by the onsite safety competent person and karst surveyor. The waste material will be temporarily stockpiled on a liner onsite, then reburied within the geomembrane lined burial trench. The waste material transferred to the burial trench will be compacted in lifts, such that there is no settling over time and the ground surface can support natural conditions and weight, including the final cover material, vegetation, animal life, and potential future uses of the land surface. Mixing of waste with soil is not anticipated. A paint filter liquids test will be performed on the waste material. If the material fails the paint filter test, the material will either be allowed to evaporate on the lined stockpile, or be removed by a vacuum truck for proper liquid disposal.
Waste sample characterization: The operator shall collect, at a minimum, a five-point composite sample of the contents of the waste material to show compliance with Table II of 19.15.17.13 NMAC.	Samples for analysis will be comprised of five-point composites and analyzed to demonstrate compliance with Table II of 19.15.17.13 NMAC. Composite samples will be collected for every 1,000 cubic yards of impacted soil. Samples will be analyzed under the follow EPA Methods: • Chloride via EPA Method 300.0

	• TPH via EPA Method 8015D • BTEX via EPA Method 8260B • Benzene via EPA Method 8260B
Waste disposal into burial trench: If, after appropriate stabilization, the concentration of all contaminants are less than or equal to the parameters listed in Table II of 19.15.17.13 NMAC, the operator may proceed to dispose of the waste in the burial trench.	Samples confirming concentrations of contaminants are less than Table II for groundwater greater than 100 feet below bottom of the burial trench will be obtained and tested. If the concentrations of all contaminants are less than or equal to the parameters listed in Table II the waste will be placed in the burial trench.
For contaminant concentrations above standards: If the concentration of any contaminant in the contents, after mixing with soil or non-waste material to a maximum ratio of 3:1, is higher than constituent concentrations shown in Table II of 19.15.17.13 NMAC, then closure must proceed in accordance with Subsection C of 19.15.17.13 NMAC.	If analysis shows parameters in exceedance of Table II for groundwater greater than 100 feet below bottom of the burial trench, then waste exceeding those parameters will be disposed off-site at an NMOCD-approved facility.
Final coverage: Upon achieving all applicable waste stabilization, the operator shall: (a) Fold the outer edges of the trench liner to overlap the waste material in the trench prior to the installation of the geomembrane cover. (b) Install a geomembrane cover of the waste material in the lined trench; the operator shall install the geomembrane cover in a manner that prevents the collection of infiltration water in the lined trench and on the geomembrane cover after the soil cover is in place; the geomembrane cover shall consist of a 20-mil string reinforced LLPDE liner or approved equivalent; the geomembrane cover shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions; cover compatibility shall comply with EPA SW-846 Method 9090A. (c) Cover the trench with non-waste containing, uncontaminated, earthen materials and construct a soil cover prescribed by Paragraph (3) of Subsection H of 19.15.17.13 NMAC	The geomembrane final cover will consist of the same RPE as the liner. The final cover and liner will be welded together to prevent the collection of infiltration water in the lined trench and on the geomembrane cover after the soil cover is in-place. Following installation of the geomembrane cover, a four-foot thick layer of uncontaminated/non-waste containing soil will be placed over the cover. Refer to Section 7.0 herein for additional cover soil details. Refer to the site drawings and the Construction Quality Assurance Plan in Appendix G for additional details.

6.0 Trench Design and Construction

The burial trench will be designed and constructed for closure in accordance with 19.15.17.11 NMAC Part K NMAC. These measures and site applications are described below and detail the engineering measures to provide protection of groundwater, surface waters, water wells or water sources, and the other areas listed in NMOCD's siting criteria from the site contaminants of concern (i.e. chlorides). The proposed lining material, Dura-Skrim N30B (or equal), has proven to be an excellent lining material in applications such as this given its durability, elasticity and chemical resistance.

Measure (19.15.17.11 NMAC Part K NMAC)	Application
Trench foundation and walls: A trench shall have a properly constructed foundation and side walls consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.	Prior to commencing remediation activities, remaining equipment including the tanks, separator, and associated piping will be removed from the location. The impacted area will be excavated with spoils stockpiled on plastic liner onsite. Based on the results of the initial assessment, the impacted area will be excavated to approximately 2 feet bgs at the perimeter of the excavation and will be sloped no steeper than 2.5:1 to a total depth of approximately 20 feet bgs in the central portion of the excavation. The burial trench volume will account for the volume of the impacted soil waste as well as a minimum of four feet of overburden. The subgrade upon which the RPE liner will be placed will be smooth drum rolled to result in a smooth, unyielding base for installation of the overlying RPE liner. It is anticipated that the existing subgrade soils are fine-grained with no potential to damage the overlying geomembrane. A safety professional will be onsite to supervise excavation and liner installation activities.
Geotextile base: Geotextile is required under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.	Based on anticipated site soils to be encountered at the base of the excavation, a geotextile cushion layer will not be required.
Geomembrane liner: A trench shall be constructed with a geomembrane liner, consisting of a 20-mil string reinforced LLDPE liner, or equivalent approved liner, composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts, acidic and alkaline solutions and compatible with EPA SW-846 Method 9090A.	The trench shall be lined with a 30-mil thick, scrim reinforced linear low-density polyethylene (Dura-Skrim N30B or equal) (RPE).
Seams: The operator shall minimize liner seams and orient them up and down, not across, a slope. The	The RPE geomembrane liner will be delivered to the site in large factory-seamed panels, minimizing field

operator shall use factory welded seams where possible. Prior to field seaming, the operator shall overlap liners four to six inches and orient liner seams parallel to the line of maximum slope. The operator shall minimize the number of field seams in corners and irregularly shaped areas. Qualified personnel shall perform field welding and testing.	seaming. Seams will be oriented along the line of maximum slope. The material will be installed by qualified and experienced personnel.
Liner material: The operator shall install sufficient liner material to reduce stress-strain on the liner.	The liner will be installed in a manner to reduce stress-strain on the liner.
Liner edges: The operator shall ensure that the outer edges of all liners are secured for the deposit of the excavated waste material into the trench.	The RPE liner will be secured with a soil berm as shown on the site drawing (Sheet 6).

Engineered trench design details are shown on Sheet 6 and a Construction Quality Assurance Plan is included in Appendix G. The engineered trench design (Sheet 6) is certified by a NM-licensed Professional Engineer (PE).

7.0 Reclamation for Former Reserve Pit as Burial Trench

The former reserve pit site will be reclaimed in accordance with Subsection H of 19.15.17.13 NMAC and SLO reclamation requirements and are described below.

Measure (Subsection H of 19.15.17.13 NMAC)	Application
Site contouring: Site contouring of the former pit and all associated areas, including access roads and affected adjacent areas to pre-undisturbed conditions. The operator shall restore, to the best extent possible, the impacted surface area to the condition that existed prior to oil and gas operations.	Site reclamation will include the removal of all non-native caliche from the well pad and associated lease road to the edge of the adjacent well pad to the west which is the Mallon Bell 3 State Com #002. The former access road will be bermed at the entrance to discourage vehicles from entering the reclaimed areas. Seed will be broadcast on the berm to encourage stabilization. Final site contouring will match the surrounding grade and will account for guiding runoff such that there is no pooling or unnatural flow patterns.
Soil cover: The soil cover shall consist of a minimum of four feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg per EPA Method 300.0. The soil cover shall include either the background thickness of topsoil or one foot of	Soil cover from top of burial trench to ground surface will be no less than 4 feet thick. Topsoil will be imported to the site and distributed to a thickness not exceeding that of the surrounding undisturbed area. A five-point composite sample will be collected and analyzed to demonstrate that soil intended for use in

suitable material to establish vegetation at the site, whichever is greater.	the top four feet of backfill meet the requirements of Paragraph (3) of Subsection H of 19.15.17.13 NMAC. Soil samples will be analyzed using EPA Method 300.0 for chlorides. Nominal compaction of this upper 4 feet of soil will be performed with construction equipment to minimize future settlement.
Soil cover grade: The soil cover shall be constructed to match the site's existing grade and prevent ponding of water and erosion of the cover material.	The area is generally level so erosion control measures will include prompt revegetation with mulching and contouring the surface to limit opportunities for concentrated surface water flow.
Reclamation and Revegetation: (a) All areas disturbed by the closure shall be reclaimed as early and as nearly as practicable to their original condition or their final land use and shall be maintained to control dust and minimize erosion. (b) Topsoils and subsoils shall be placed in their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed areas shall be reseeded in the first favorable growing season following closure. (c) Reclamation shall be considered complete when a uniform vegetative cover has been established that reflects a life-form ratio of plus or minus 50% of predisturbed levels and at total percent plant cover of at least 70% of predisturbed levels, excluding noxious weeds. (d) Re-vegetation and reclamation obligation imposed by other applicable federal or tribal agencies on lands managed by those agencies shall supersede these provisions, provided that the other requirements provide equal or better protection of fresh water, human health, and environment. (e) The operator shall notify the division when reclamation and re-vegetation are complete. Alternative: The operator may propose an alternative to the re-vegetation requirement if the operator demonstrates to the appropriate district office that the alternative provides equal or better prevention of erosion, and protection of fresh water, public health, and the environment.	The disturbed area will be cross-ripped to a minimum of 18 inches with furrow spacing of 2 feet. Seed bed preparation will include adding amended soil if needed, and recontouring the ripped area to the original form as near as possible. Seeding will be conducted within two weeks of the seedbed preparation. Seedbed preparation should coincide with the next planting season. Per State Land Office and the known soils at the site, a loamy seed mixture will be used for revegetation. The seed mixture will be spread with a handheld or mechanical broadcaster and raked in at approximately 18.0 pure live seed (PLS) per acre. After seeding the area will be watered in and mulching applied to limit erosion and promote moisture retention for seedling growth. A copy of the SLO-approved seed mixture and application directions are included in Appendix H. The revegetated area will be monitored for natural life-forms including plant cover, until at least 70% representative coverage is achieved. Noxious weeds will be identified and treated by licensed contracted herbicide applicators or mechanically removed. Reclamation activities will be documented with photographs in landscape view and timestamped with GPS data in decimal degrees. Through site visits, noxious and invasive weeds will be identified, inventoried and treated by a licensed contracted herbicide applicator or mechanically removed.

	At a minimum, annual inspections will be performed for the location until revegetation is consistent with local natural vegetation density. The operator will notify NMOCD and SLO when revegetation and reclamation are considered complete, including completion of the C-103 form. No alternatives are proposed at this time.

8.0 Project Oversite and Safety

To account for the high karst potential and associated hazards, all workers shall comply with 29 CFR Part 1926 Subpart P (Excavations) and Subpart M (Fall Protection). A safety competent person will be onsite throughout the excavation and liner installation process.

A karst specialist or surveyor will be present throughout the excavation to conduct a geophysical survey and to observe for potential of karst development.

At completion of excavation to total depth, a qualified SMA employee will verify with the safety competent person and karst specialist that the liner is suitable for installation.

No personnel are allowed inside the excavation unless approved by both the safety competent person and karst specialist.

9.0 Schedule

Following the approval of this Closure Plan and submittal of the appropriate notifications, remediation activities will begin and are expected to require approximately eight weeks to complete. Removal of the non-native caliche, installation of topsoil, and recontouring will take place within four weeks of remediation activity completion and revegetation activities will be performed during the next planting season.

10.0 Scope and Limitations

The scope of our services included: assessment sampling, regulatory liaison, and preparing this remediation plan. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas operations in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact SMA at (505) 325-7535.

Submitted by:
SOUDER, MILLER & ASSOCIATES

Stephanie Hinds, P.E.
Senior Engineer

Reviewed by:

Reid S. Allan, P.G.
Principal Scientist

ATTACHMENTS

Sheets:

Sheet 1: Topographic Site Map
Sheet 2: Aerial Site Map
Sheet 3: Site Characterization Map
Sheet 4: Horizontal Extent of Impacted Soil
Sheet 5: Remedial Excavation Cross Sections
Sheet 6: Liner and Cover Details

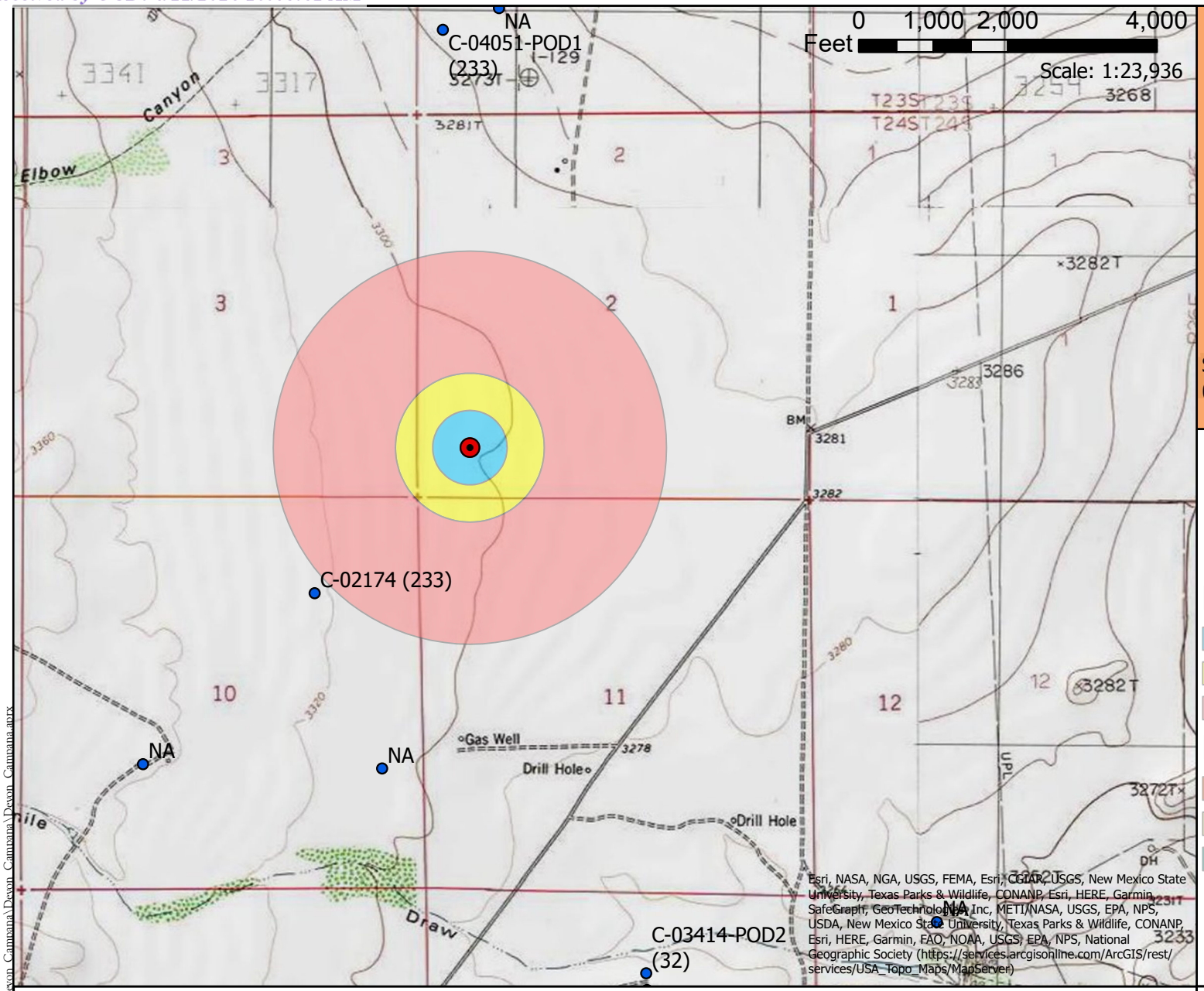
Tables:

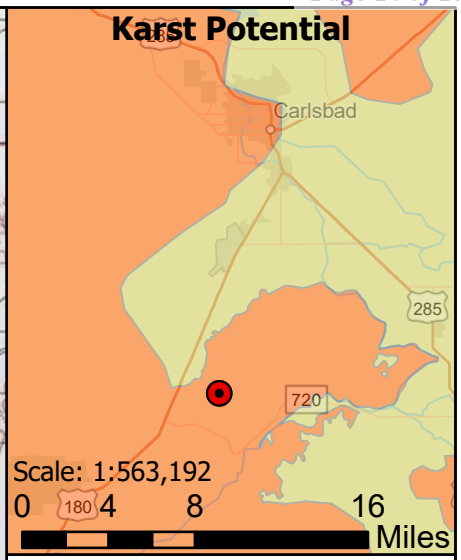
Table 2: NMOCD Release Closure Criteria
Table 3: NMOCD Burial Trench Closure Criteria
Table 4: Summary of Field Screening and Laboratory Analytical Results

Appendices:

Appendix A: NMOCD Forms and Other Historical Files
Appendix B: Google Earth® Aerial Imagery (1997-2023)
Appendix C: Cave and Karst Resource Inventory Report, NRCS Web Soil Survey, Water Well Documentation
Appendix D: Delineation Field Notes
Appendix E: Sampling Protocol
Appendix F: Laboratory Analytical Report
Appendix G: Construction Quality Assurance Plan
Appendix H: SLO Seed Mix, SLO Email Correspondences

SHEETS





Legend

- Campana 2M State #1 Well Head
- OSE GW Wells (depth in ft)

Buffer Distance

- 500 feet
- 1000 feet
- 0.5 mile

Karst Potential

- High
- Medium
- Low

N

Well Head Coordinates:
-104.270502W 32.241337N

Topographic Site Map
Campana 2M State #001 - Devon Energy Production Co.
UL: M S: 2 T: 24S R: 26E, Eddy County, New Mexico

Figure 1

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Drawn Sarahmay Schlea
Date 12/22/2022
Checked
Approved

SMA
Souder, Miller & Associates
Engineering • Environmental
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201 South Halagueno Street
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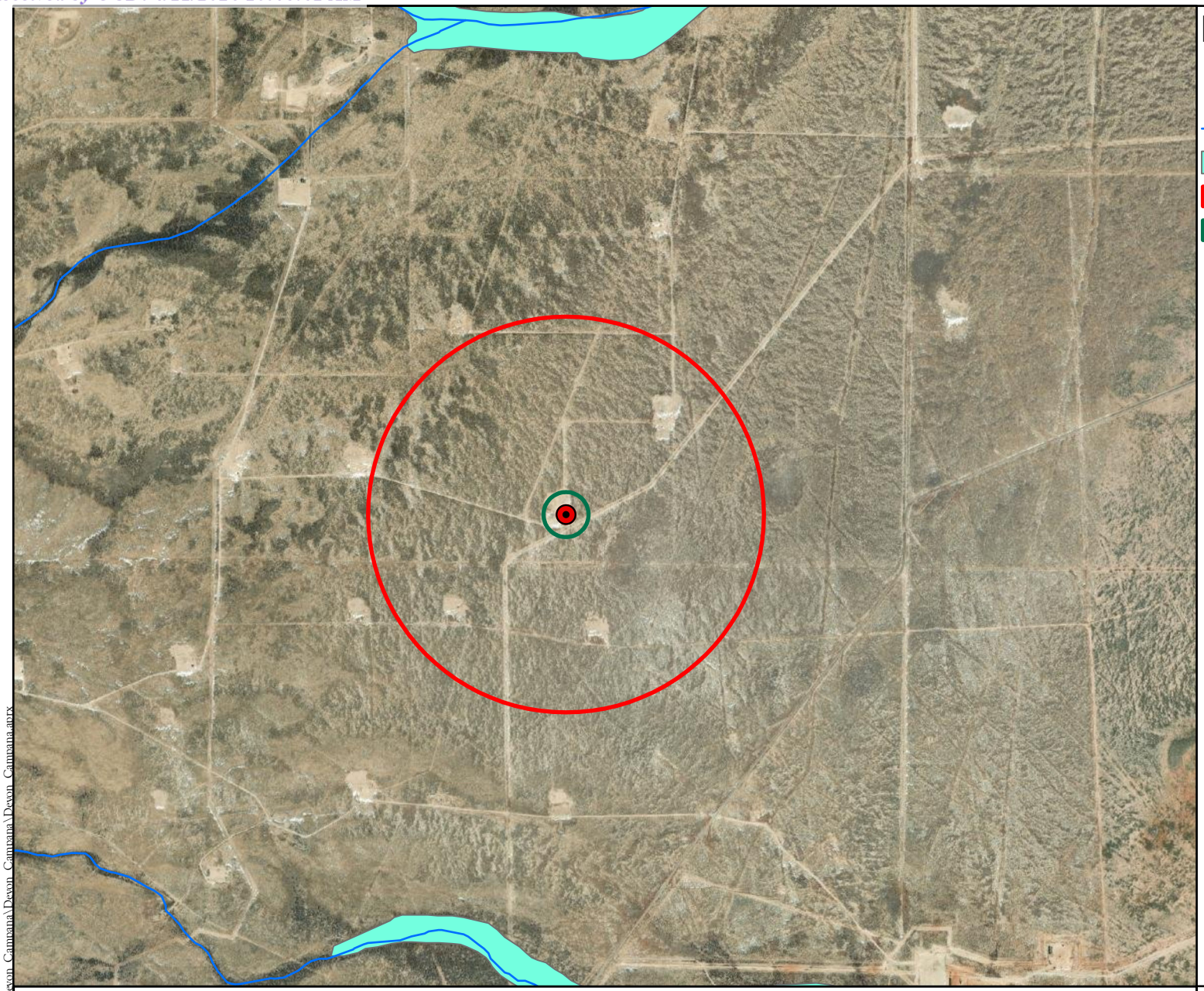
(575) 689-7040
Serving the Southwest & Rocky Mountains



Legend

- Campana 2M State #1 Well Head
- Streams/Canals/Flowlines
- FEMA Flood Zones
- 0.5 Mile Radius
- 300 Foot Radius

0 2,000 4,000

Feet

Scale: 1:23,783

N

Well Head Coordinates:
-104.270502W 32.241337N

Aerial Site Map
Campana 2M State #001 - Devon Energy Production Co.
UL: M S: 2 T: 24S R: 26E, Eddy County, New Mexico

Figure 2

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Drawn Sarahmay Schlea
Date 12/22/2022
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SMA
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LEGEND

⊕	SAMPLE LOCATION
Ⓦ	WELLL HEAD MONUMENT
G	BURIED PIPELINE

SAMPLE DEPTHS ARE SHOWN IN FEET, ELECTRICAL CONDUCTIVITY IS IN mS/cm, AND CHLORIDE CONCENTRATIONS ARE IN mg/kg

TH-2

Depth	ElcCnd	Cl-
Surface	0.16	--
2	0.13	--
4	--	--
6	--	--

TH-23

Depth	ElcCnd	Cl-
Surface	0.13	--
2	0.29	130
4	0.12	--

TH-12

Depth	ElcCnd	Cl-
Surface	>20	--
2	1.33	--
4	0.14	--
6	0.31	--

TH-22

Depth	ElcCnd	Cl-
Surface	2.26	--
2	2.22	--
4	2.60	4,500

BG-1

Depth	ElcCnd	Cl-
Surface	0.12	--
2	0.31	250
4	0.13	--

TH-13

Depth	ElcCnd	Cl-
Surface	0.20	--
2	--	--
4	--	--
6	0.19	--

TH-11

TH-10

Depth	ElcCnd	Cl-
Surface	>20	--
2	5.63	--
4	--	--
6	1.89	--
8	1.17	--
10	1.64	--
12	0.32	620
13	--	410

Depth	ElcCnd	Cl-
Surface	0.42	250
2	--	--
4	--	--
6	0.18	--

TH-3

Depth	ElcCnd	Cl-
Surface	>20	--
2	0.76	--
4	0.45	460
6	0.31	--

TH-1

Depth	ElcCnd	Cl-
Surface	>20	--
2	--	--
4	--	--
6	4.71	--
8	2.94	--
10	2.40	7,600

TH-8

Depth	ElcCnd	Cl-
Surface	8.16	--
2	--	--
4	--	--
6	1.15	--
8	1.55	2,200
10	0.25	--

TH-4

Depth	ElcCnd	Cl-
Surface	0.35	150
2	--	--
4	--	--
6	0.14	--

TH-6

Depth	ElcCnd	Cl-
O	>20	--
200	--	--
4	--	--
6	2.08	--
8	1.55	--
10	0.92	1,500

TH-9

Depth	ElcCnd	Cl-
Surface	2.87	1,800
2	0.37	--
4	--	--
6	0.15	--

TH-7

Depth	ElcCnd	Cl-
Surface	8.08	--
2	--	--
4	--	--
6	1.24	--

TH-14

Depth	ElcCnd	Cl-
Surface	3.17	4,200
2	0.57	--
4	0.25	--
6	0.28	--

TH-15

TH-21

Depth	ElcCnd	Cl-
Surface	0.72	--
2.000	1.19	--
4.000	1.45	2,300

TH-5

Depth	ElcCnd	Cl-
Surface	13.23	16,000
2	3.19	--
4	2.13	--
6	1.60	--
8	0.26	--
10	0.36	--

TH-20

Depth	ElcCnd	Cl-
Surface	0.21	--
2	0.45	530
4	0.40	--

WELL HEAD MONUMENT

TH-17

Depth	ElcCnd	Cl-
Surface	12.61	>20,000
2	--	--
4	--	--
6	0.77	--
8	0.25	--

EXISTING TANK BATTERY

TH-19

Depth	ElcCnd	Cl-
Surface	0.08	--
2	0.10	--
4	0.09	--

TH-18

Depth	ElcCnd	Cl-
Surface	6.49	9,300
2	0.60	--
4	0.46	--
6	0.38	--

TH-16

Depth	ElcCnd	Cl-
Surface	0.58	410
2	0.25	--
4	--	--
6	0.11	--

Depth	ElcCnd	Cl-
Surface	0.63	1,100
2	0.20	--
4	0.25	--

EXISTING TANK BATTERY

N

0 50' 100'

SCALE: 1" = 50'

SOUDER, MILLER & ASSOCIATES
Serving the Southwest & Rocky Mountains
5454 Venice Avenue NE, Suite D
Albuquerque, NM 87113
Phone (505) 299-0942 Fax (505) 293-3430
www.soudermiller.com

Rev #	Date	Description

GPS

WPX ENERGY

CAMPANA 2M STATE #001
SEC 2 T24S R26E NMPM
EDDY COUNTY, NM

SITE CHARACTERIZATION MAP

Designed	Drawn	Checked
SH	JOA	SH

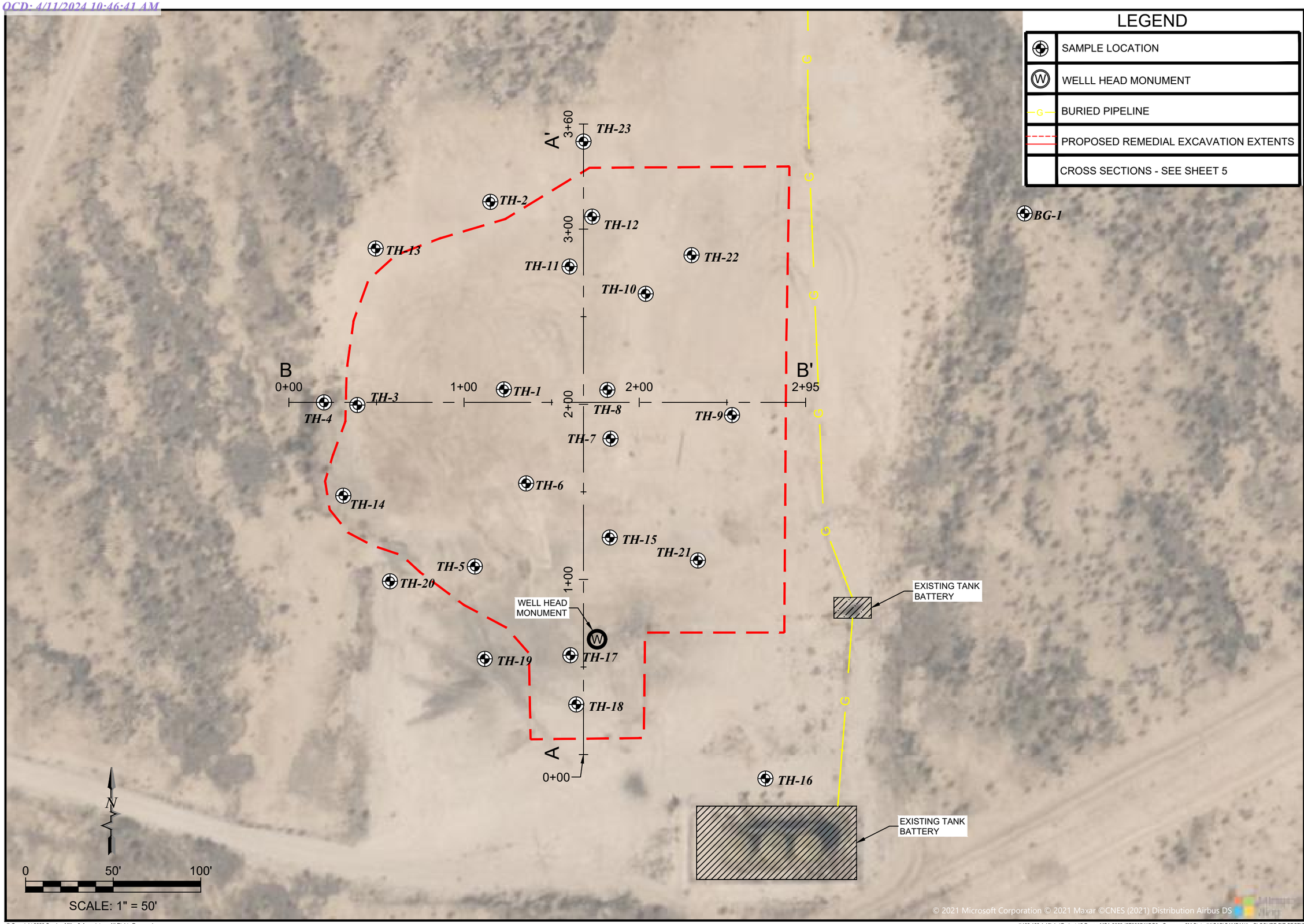
Date: June 2023

Scale: Horiz: NA Vert: NA

Project No: 5E32074

Sheet: 3 OF 6

\\192.168.1.10\cbo\Projects\5-Devon MSA 2023 (5E32074)\BG9 - Campana 2M State #1\CAD\CAMPANA - CLOSURE PIT SECTIONS sah.dwg, SAH, 6/7/2023 12:16 PM



LEGEND

⊕	SAMPLE LOCATION
Ⓦ	WELLL HEAD MONUMENT
G	BURIED PIPELINE
	PROPOSED REMEDIAL EXCAVATION EXTENTS
	CROSS SECTIONS - SEE SHEET 5

Rev #	Date	Description

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GPS

WPX ENERGY

CAMPANA 2M STATE #001
SEC 2 T24S R26E NMPM
EDDY COUNTY, NM
REMEDIAL EXCAVATION CROSS SECTION TRACES

Designed	Drawn	Checked
SH	JOA	SH

Date: June 2023

Scale: Horiz: NA
Vert: NA

Project No: 5E32074

Sheet: 4 OF 6

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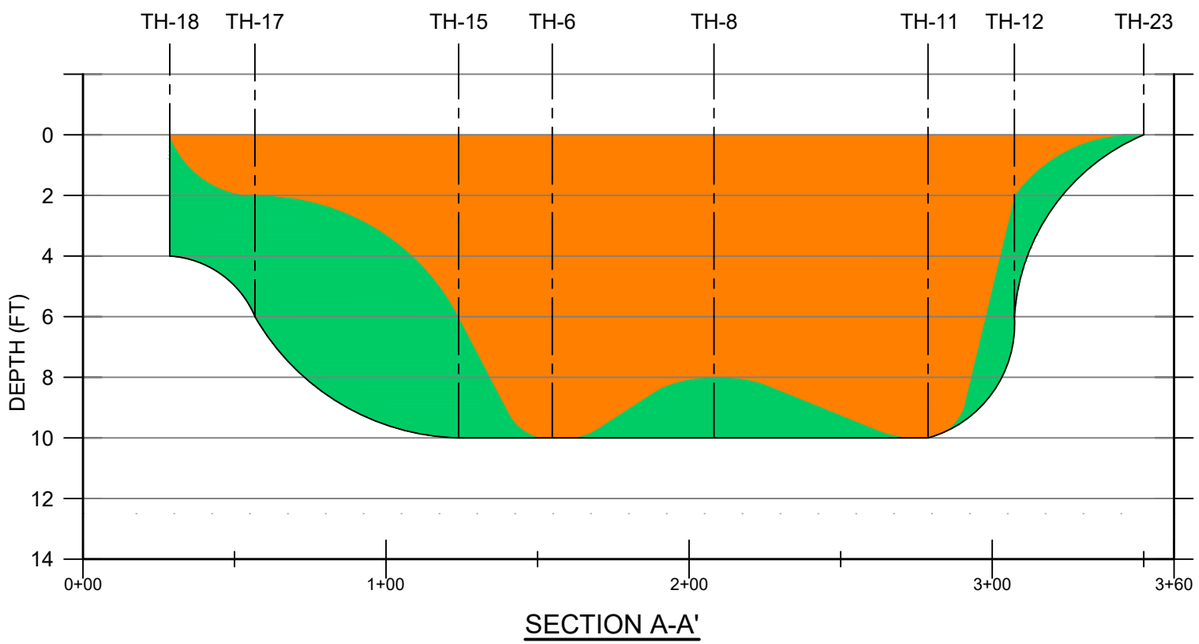
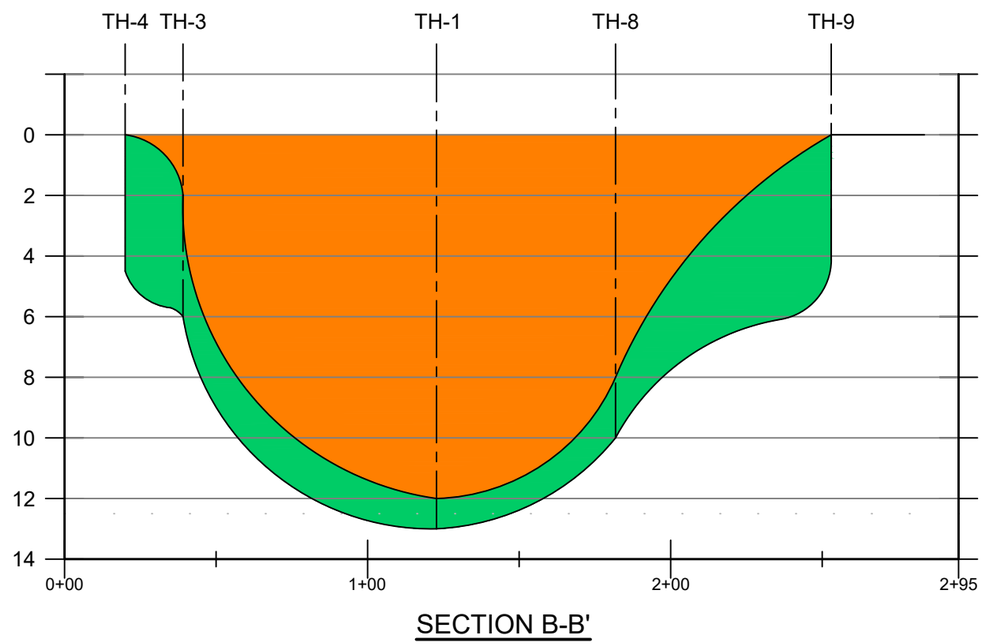


SECTION A-A'



SECTION B-B'

LEGEND

ABOVE RELEASE CLOSURE CRITERIA

BELOW RELEASE CLOSURE CRITERIA

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WPX ENERGY

CAMPANA 2M STATE #001
SEC 2 T24S R26E NMPM
EDDY COUNTY, NM

REMEDIAL EXCAVATION CROSS SECTIONS

Designed	Drawn	Checked
SH	JOA	SH

Date: June 2023

Scale: Horiz: NA
Vert: NA

Project No: 5E32074

Sheet: 5 OF 6

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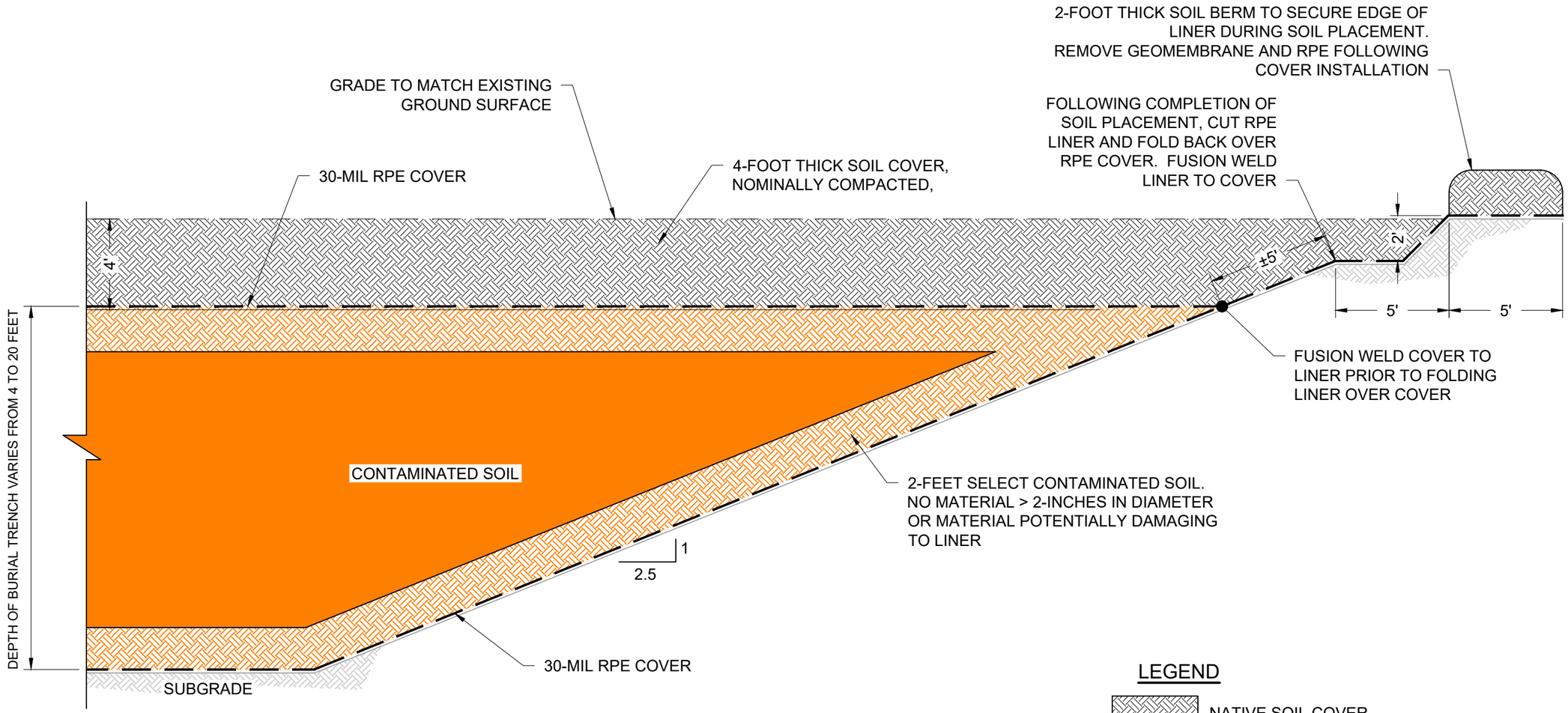

LEGEND

- NATIVE SOIL COVER
- CONTAMINATED SOIL
- SELECT CONTAMINATED SOIL
- 30-MIL RPE

LINER AND COVER SCHEMATIC SECTION

NOT TO SCALE

THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY AND HEALTH REGULATIONS (29 CFR Part 1926), WHICH SHALL REMAIN WHOLLY THE RESPONSIBILITY OF THE CONTRACTOR. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL (OSHA), STATE, AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING SAFETY AND HEALTH. ALL EXCAVATION, TRENCHING AND SHORING ACTIVITIES MUST BE CARRIED OUT IN ACCORDANCE WITH OSHA 29 CFR 1926, SUBPART P - EXCAVATIONS.

MICHAEL J. PRETTI NEW MEXICO 01-03-24 25806 PROFESSIONAL ENGINEER

Rev #	Date	Description

SOUDER, MILLER & ASSOCIATES
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GPS

WPX ENERGY

CAMPANA 2M STATE #001
SEC 2 T24S R26E NMPM
EDDY COUNTY, NM

LINER AND COVER DETAILS

Designed	Drawn	Checked
SH	JOA	SH

Date: June 2023

Scale: Horiz: NA Vert: NA

Project No: 5E32074

Sheet: 6 OF 6

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TABLES

Table 2
Release Closure Criteria

Devon Energy Production Company
Campana 2M State #001

Site Information (19.15.29.11.A(2, 3, and 4) NMAC)		Source/Notes
Depth to Groundwater (feet bgs)	233	New Mexico Office of the State Engineer
Hortizontal Distance From All Water Sources Within 1/2 Mile (ft)	2,770	New Mexico Office of the State Engineer
Hortizontal Distance to Nearest Significant Watercourse (ft)	5,540	United States Geological Survey Topo Map

Closure Criteria (19.15.29.12.C(4) and Table 1 NMAC)						
Depth to Groundwater		**Closure Criteria (units in mg/kg)**				
		Chloride *numerical limit or background, whichever is greater	**TPH**	**GRO + DRO**	**BTEX**	**Benzene**
< 50' BGS		600	100		50	10
51' to 100'		10,000	2,500	1,000	50	10
>100'	X	20,000	2,500	1,000	50	10
Surface Water	**yes or no**	**If yes, then**				
<300' from continuously flowing watercourse or other significant watercourse?	no	600	100		50	10
<200' from lakebed, sinkhole or playa lake?	no					
Water Well or Water Source						
<500 feet from spring or a private, domestic fresh water well used by less than 5 households for domestic or stock watering purposes?	no					
<1,000' from fresh water well or spring?	no					
Human and Other Areas						
<300' from an occupied permanent residence, school, hospital, institution or church?	no					
within incorporated municipal boundaries or within a defined municipal fresh water well field?	no					
<100' from wetland?	no					
within area overlying a subsurface mine	no					
within an unstable area?	**yes**					
within a 100-year floodplain?	no					

Table 3
Burial Trench Closure Criteria

Devon Energy Production Company
Campana 2M State #001

Site Information (19.15.17.13 Table II NMAC)		Source/Notes
Depth to Groundwater (feet bgs)	233	New Mexico Office of the State Engineer
Horizontal Distance From All Water Sources Within 1/2 Mile (ft)	2,770	New Mexico Office of the State Engineer
Horizontal Distance to Nearest Significant Watercourse (ft)	5,540	United States Geological Survey Topo Map

Closure Criteria (19.15.17.13 Table II NMAC)						
Depth below bottom of pit to groundwater less than 10,000 mg/L TDS		**Closure Criteria (units in mg/kg)**				
		Chloride *numerical limit or background, whichever is greater	**TPH**	**GRO + DRO**	**BTEX**	**Benzene**
25' to 50'		20,000	100		50	10
51' to 100'		40,000	2,500	1,000	50	10
>100'	X	80,000	2,500	1,000	50	10

Siting Criteria for In-Place Closure of Burial Trench (Subsection C of 19.15.17.11 NMAC)		
Groundwater		**If yes, then no burial trench allowed or request a variance.**
<25' from below the bottom of the buried waste	no	The former reserve pit and proposed burial trench is located in an area of high karst potential. Variance is requested. See Section 5.0 of Closure Report.
Surface Water		
<100' from continuously flowing watercourse or other significant watercourse?	no	
<200' from lakebed, sinkhole or playa lake?	no	
Water Well or Water Source		
<300 feet from spring or a private, domestic fresh water well used by less than 5 households for domestic or stock watering purposes?	no	
Human and Other Areas		
<300' from an occupied permanent residence, school, hospital, institution or church?	no	
within incorporated municipal boundaries or within a defined municipal fresh water well field?	no	
<300' from wetland?	no	
within area overlying a subsurface mine	no	
within an unstable area?	yes	
within a 100-year floodplain?	no	

Table 4
Summary of Field Screening and Laboratory Analytical Results

Devon Energy Production Co.
Campana 2M State #001

Sample ID	Sample Date	Depth of Sample (feet bgs)	Field Screening	Method 300.0	Method 8015D			
			Electrical Conductivity	Cl-	GRO	DRO	MRO	Total TPH
			mS/cm	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NMOCD Reclamation Requirement (0-4 ft)			--	**600**	--	--	--	**100**
NMOCD Closure Criteria (>4 ft)			--	**600**	--	--	--	**100**
TH-1	3/9/2021	Surface	>20	--	--	--	--	--
		2	5.63	--	--	--	--	--
		4	--	--	--	--	--	--
		6	1.89	--	--	--	--	--
		8	1.17	--	--	--	--	--
		10	1.64	--	--	--	--	--
		11.5	0.32	620	<4.8	<9.2	<46	ND
		13	--	410	--	--	--	--
TH-2	3/9/2021	Surface	0.16	--	--	--	--	--
		2	0.13	--	--	--	--	--
		4	--	--	--	--	--	--
		6	--	--	--	--	--	--
TH-3	3/9/2021	Surface	>20	--	--	--	--	--
		2	0.76	--	--	--	--	--
		4	0.45	460	--	--	--	--
		6	0.31	--	--	--	--	--
TH-4	3/9/2021	Surface	0.35	150	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.14	--	--	--	--	--
TH-5	3/9/2021	Surface	12.61	27,000	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.77	--	--	--	--	--
		8	0.25	--	--	--	--	--
TH-6	3/9/2021	Surface	>20	--	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	2.08	--	--	--	--	--
		8	1.55	--	--	--	--	--
		10	0.92	1,500	--	--	--	--
TH-7	3/9/2021	Surface	8.08	--	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	1.24	--	--	--	--	--
TH-8	3/9/2021	Surface	8.16	--	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	1.15	--	--	--	--	--
		8	1.55	2,200	--	--	--	--
		9.5	0.25	--	--	--	--	--

Table 4
Summary of Field Screening and Laboratory Analytical Results

Devon Energy Production Co.
Campana 2M State #001

Sample ID	Sample Date	Depth of Sample (feet bgs)	Field Screening	Method 300.0	Method 8015D			
			Electrical Conductivity	Cl-	GRO	DRO	MRO	Total TPH
			mS/cm	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NMOCD Reclamation Requirement (0-4 ft)			--	**600**	--	--	--	**100**
NMOCD Closure Criteria (>4 ft)			--	**600**	--	--	--	**100**
TH-9	3/9/2021	Surface	2.87	1,800	--	--	--	--
		2	0.37	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.15	--	--	--	--	--
TH-10	3/9/2021	Surface	0.42	250	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.18	--	--	--	--	--
TH-11	3/9/2021	Surface	>20	--	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	4.71	--	--	--	--	--
		8	2.94	--	--	--	--	--
		10	2.40	7,600	--	--	--	--
TH-12	3/9/2021	Surface	>20	--	--	--	--	--
		2	1.33	--	--	--	--	--
		4	0.14	--	--	--	--	--
		6	0.31	--	--	--	--	--
TH-13	3/9/2021	Surface	0.20	--	--	--	--	--
		2	--	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.19	--	--	--	--	--
TH-14	3/9/2021	Surface	3.17	4,200	--	--	--	--
		2	0.57	--	--	--	--	--
		4	0.25	--	--	--	--	--
		6	0.28	--	--	--	--	--
TH-15	3/9/2021	Surface	13.23	16,000	--	--	--	--
		2	3.19	--	--	--	--	--
		4	2.13	--	--	--	--	--
		6	1.60	--	--	--	--	--
		8	0.26	--	--	--	--	--
		10	0.36	--	--	--	--	--
TH-16	3/9/2021	Surface	0.58	410	<4.9	<9.2	<46	ND
		2	0.25	--	--	--	--	--
		4	--	--	--	--	--	--
		6	0.11	--	--	--	--	--
TH-17	3/9/2021	Surface	6.49	9,300	--	--	--	--
		2	0.6	--	--	--	--	--
		4	0.46	--	--	--	--	--
		6	0.38	--	--	--	--	--

Table 4
Summary of Field Screening and Laboratory Analytical Results

Devon Energy Production Co.
Campana 2M State #001

Sample ID	Sample Date	Depth of Sample (feet bgs)	Field Screening	Method 300.0	Method 8015D			
			Electrical Conductivity	Cl-	GRO	DRO	MRO	Total TPH
			mS/cm	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NMOCD Reclamation Requirement (0-4 ft)			--	**600**	--	--	--	**100**
NMOCD Closure Criteria (>4 ft)			--	**600**	--	--	--	**100**
TH-18	3/10/2021	Surface	0.63	1,100	--	--	--	--
		2	0.20	--	--	--	--	--
		4	0.25	--	--	--	--	--
TH-19	3/10/2021	Surface	0.08	--	--	--	--	--
		2	0.10	--	--	--	--	--
		4	0.09	--	--	--	--	--
TH-20	3/10/2021	Surface	0.21	--	--	--	--	--
		2	0.45	530	--	--	--	--
		4	0.40	--	--	--	--	--
TH-21	3/10/2021	Surface	0.72	--	--	--	--	--
		2	1.19	--	--	--	--	--
		4	1.45	2,300	--	--	--	--
TH-22	3/10/2021	Surface	2.26	--	--	--	--	--
		2	2.22	--	--	--	--	--
		4	2.60	4,500	--	--	--	--
TH-23	3/10/2021	Surface	0.13	--	--	--	--	--
		2	0.29	130	--	--	--	--
		4	0.12	--	--	--	--	--
BG-1	3/10/2021	Surface	0.12	--	--	--	--	--
		2	0.31	250	--	--	--	--
		4	0.13	--	--	--	--	--

Notes:
"--" = not analyzed
TH - test hole
BG - background
NMOCD - New Mexico Oil Conservation Division
bgs - below grade surface
mS/cm - millisiemens per centimeter
mg/kg - milligrams per kilogram
TPH - total petroleum hydrocarbons
GRO - gasoline range organics
DRO - diesel range organics
MRO - motor oil range organics

APPENDIX A

NMOCD FORMS AND OTHER HISTORICAL FILES

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

Form C-144
Revised October 11, 2022

Pit, Below-Grade Tank, or Proposed Alternative Method Permit or Closure Plan Application

Type of action:
- ☐ Below grade tank registration
- ☐ Permit of a pit or proposed alternative method
- ☐ Closure of a pit, below-grade tank, or proposed alternative method
- ☐ Modification to an existing permit/or registration
- ☒ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request

Please 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: WPX Energy Permian, LLC. OGRID #: 246289

Address: 333 West Sheridan Avenue, Oklahoma City, OK 73102

Facility or well name: Campana 2M State #001

API Number: 30-015-31725 OCD Permit Number:

U/L or Qtr/Qtr M Section 2 Township 24S Range 26E County: Eddy

Center of Proposed Design: Latitude 32.241337 Longitude -104.270502 NAD83

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

2.

☐ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC

Temporary: ☐ Drilling ☐ Workover

☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☒ yes ☐ no

☐ Lined ☐ Unlined Liner type: Thickness _____mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other _____

☐ String-Reinforced

Liner Seams: ☐ Welded ☐ Factory ☐ Other _____ Volume: _____bbl Dimensions: L_____ x W_____ x D_____

3.

☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC

Volume: _____bbl Type of fluid: _____

Tank Construction material: _____

☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off

☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other _____

Liner type: Thickness _____mil ☐ HDPE ☐ PVC ☐ Other _____

4.

☒ **Alternative Method:** Request for closure of a burial trench (Subsection K of 19.15.17.11 NMAC.

Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.

Fencing: Subsection D of 19.15.17.11 NMAC *(Applies to permanent pits, temporary pits, and below-grade tanks)* **NA**

☐ Chain link, six feet in height, two strands of barbed wire at top *(Required if located within 1000 feet of a permanent residence, school, hospital, institution or church)*

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

☐ Alternate. Please specify_____

6.
Netting: Subsection E of 19.15.17.11 NMAC *(Applies to permanent pits and permanent open top tanks)* NA

☐ Screen ☐ Netting ☐ Other_____

☐ Monthly inspections (If netting or screening is not physically feasible)

7.
Signs: Subsection C of 19.15.17.11 NMAC NA

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

☐ Signed in compliance with 19.15.16.8 NMAC

8.
Variances and Exceptions:

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance. Burial trench to be located in an area of high karst potential.

Please check a box if one or more of the following is requested, if not leave blank:

☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval.

☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.
Siting Criteria (regarding permitting): 19.15.17.10 NMAC

Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. **Siting criteria does not apply to drying pads or above-grade tanks.**

General siting	
Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank. - ☒ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells	☐ Yes ☒ No ☐ NA
Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit . 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. **(Does not apply to below grade tanks)** - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)** - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☒ No
Within an unstable area. **(Does not apply to below grade tanks)** - 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. **(Does not apply to below grade tanks)** - FEMA map	☐ Yes ☒ No
Below Grade Tanks	
Within 100 feet of a continuously flowing watercourse, significant watercourse, lake bed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit using Low Chloride Drilling Fluid (maximum chloride content 15,000 mg/liter) Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.) - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet from a occupied 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 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application. NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No

Within 100 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Temporary Pit Non-low chloride drilling fluid	
Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 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 private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application; - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Within 300 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☐ No
Permanent Pit or Multi-Well Fluid Management Pit	
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

10.

Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist: Subsection B of 19.15.17.9 NMAC

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

☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
☐ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

11.

Multi-Well Fluid Management Pit Checklist: Subsection B of 19.15.17.9 NMAC

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

☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
☐ A List of wells with approved application for permit to drill associated with the pit.
☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: _____ or Permit Number: _____

12.
Permanent Pits Permit Application Checklist: Subsection B of 19.15.17.9 NMAC
Instructions: Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Climatological Factors Assessment
- ☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Quality Control/Quality Assurance Construction and Installation Plan
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Nuisance or Hazardous Odors, including H_2S, Prevention Plan
- ☐ Emergency Response Plan
- ☐ Oil Field Waste Stream Characterization
- ☐ Monitoring and Inspection Plan
- ☐ Erosion Control Plan
- ☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13.
Proposed Closure: 19.15.17.13 NMAC
Instructions: Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

Type: ☐ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit ☒ Alternative

Proposed Closure Method: ☐ Waste Excavation and Removal
☐ Waste Removal (Closed-loop systems only)
☒ On-site Closure Method (Only for temporary pits and closed-loop systems)
☐ In-place Burial ☒ On-site Trench Burial
☐ Alternative Closure Method

14.
Waste Excavation and Removal Closure Plan Checklist: (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings) NA
- ☒ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15.
Siting Criteria (regarding on-site closure methods only): 19.15.17.10 NMAC
Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 25 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ NA
Ground water is between 25-50 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ NA
Ground water is more than 100 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☒ Yes ☐ No ☐ NA
Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☒ No
Within 300 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 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site	☐ Yes ☒ No
Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within 300 feet of a wetland. US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ Yes ☒ No
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
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral 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

16.
On-Site Closure Plan Checklist: (19.15.17.13 NMAC) ***Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.***

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☐ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☒ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☐ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC NA
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved) NA
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

17.
~~Operator Application Certification:~~
I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Jim Raley Title: Environmental Specialist

Signature: Jim Raley Date: 4/11/2024

e-mail address: jim.raley@dvn.com Telephone: 701-310-5194

18.
OCD Approval: ☐ Permit Application (including closure plan) ☒ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: Victoria Venegas **Approval Date:** 04/23/2024

Title: Environmental Specialist **OCD Permit Number:** 30-015-31725 CAMPANA 2M ~~STATE #001~~

19.
Closure Report (required within 60 days of closure completion): 19.15.17.13 NMAC
Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.

☐ **Closure Completion Date:**

20.
Closure Method:
☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)
☐ If different from approved plan, please explain.

21.
Closure Report Attachment Checklist: ***Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.***

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude _____ Longitude _____ NAD: ☐ 1927 ☐ 1983

22.

Operator Closure Certification:

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): _____ Title: _____

Signature:_____ Date: _____

e-mail address:_____ Telephone: _____

C151

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 South First, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

RECEIVED
APR 2001
OCD - ARTESIA

Form C-101
Revised March 17, 1999

Submit to appropriate District Office
State Lease - 6 Copies
Fee Lease - 5 Copies

☐ AMENDED REPORT

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

[1] Operator Name and Address		[2] OGRID Number
Devon Energy Production Company, L.P. **20 North Broadway, Suite 1500** **Oklahoma City, Oklahoma 73102-8260**	Walter M. Frank Senior Operations Engineer (405) 552-4595	**6137**
		[3] API Number 30 – 015 – 31725

[3] Property Code	[5] Property Name	[6] Well No.
27993	**CAMPANA "2M" STATE**	**1**

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	**2**	**24S**	**26E**		**660'**	**SOUTH**	**660'**	**WEST**	**EDDY**

[8] Proposed Bottom Hole Location If Different From Surface

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

[9] Proposed Pool 1	[10] Proposed Pool 2
CARLSBAD, SOUTH (MORROW)	

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	**G**	**R**	**P**	**GL 3298'**
[16] Multiple	[17] Proposed Depth	[18] Formation	[19] Contractor	[20] Spud Date
No	**12,000'**	**MORROW**	**Unknown at this time**	**JULY, 2001**

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
17 1/2"	**13 3/8"**	**48# H-40**	**450'**	**500**	**surface**
12 1/4"	**8 5/8"**	**32# J-55 & HCK-55**	**5500'**	**1000**	**surface**
7 7/8"	**5 1/2"**	**17# L-80 & J-55**	**12,000'**	**1250**	**6500'**

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

Devon plans to drill this well to a total depth of 12,000 feet and complete it as a Morrow development well. If it is deemed non-commercial then it will be plugged and abandoned in accordance with the rules and regulations established by the New Mexico OCD.

Blowout prevention equipment will be installed while drilling the intermediate and production holes.

Attached are C102 plat, maps, BOP equipment and casing design sheets, H2S plan, and Proof of bond.

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: Candace R. Graham

Printed name: **Candace R. Graham**

Title: **Engineering Tech.**

Date: **April 23, 2001**

Phone: **(405) 235-3611, X4520**

OIL CONSERVATION DIVISION

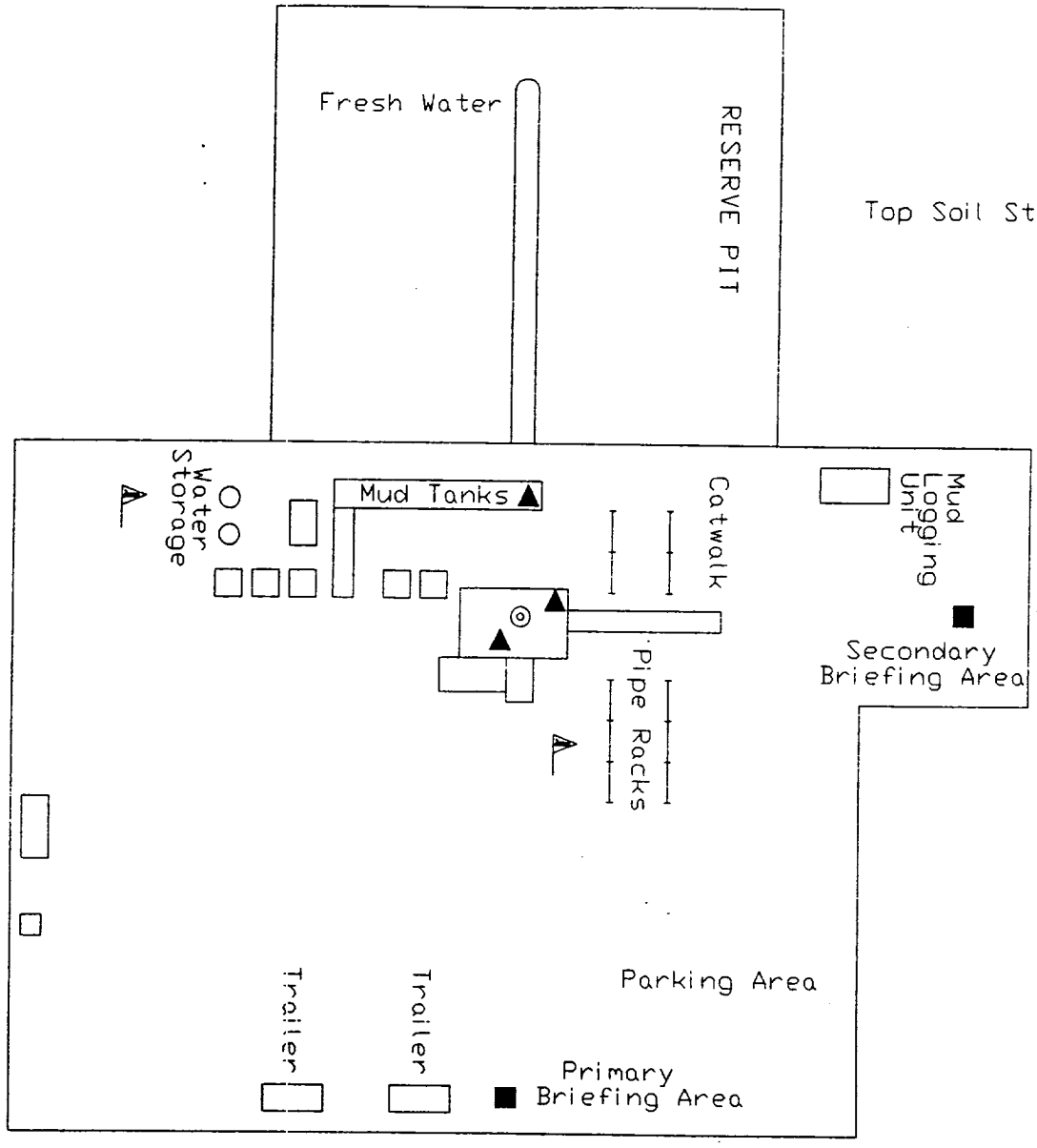
Approved by: **ORIGINAL SIGNED BY TIM W. GUM**
DISTRICT II SUPERVISOR

Title:

Approval Date: **APR 26 2001** Expiration Date: **APR 26 2002**

Conditions of Approval:

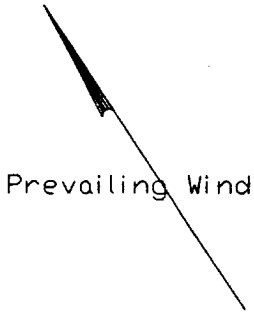
Attached ☐



▲ H2S MONITORS WITH ALARMS AT THE BELL NIPPLE, SUBSTRUCTURE, AND SHALE SHAKER

WIND DIRECTION INDICATORS

■ SAFE BRIEFING AREAS WITH CAUTION SIGNS AND PROTECTIVE BREATHING EQUIPMENT



File: Q:\\NM\H2S-PLAN

devon

EDDY COUNTY, NEW MEXICO

H2S PLAN

Scale in Feet

25 0 25 50 75 100

4/97

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

RECEIVED
DEC 11 2019
DISTRICT II-ARTESIA O.C.D.

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011

WELL API NO.
30-015-31725

5. Indicate Type of Lease
STATE X FEE

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name
COMPANA 2M STATE

1. Type of Well: Oil Well Gas Well X Other

8. Well Number
001

2. Name of Operator
CHISHOLM ENERGY OPERATING, LLC

9. OGRID Number
372137

3. Address of Operator
801 CHERRY ST., SUITE 1200, UNIT 20, FORT WORTH, TEXAS 76102

10. Pool name or Wildcat
BLACK RIVER; UPPER PENN, GAS

4. Well Location
Unit Letter M : 660 feet from the SOUTH line and 660 feet from the WEST line
Section 02 Township 24S Range 26E NMPM EDDY County

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)*
3,298' – GR

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A X
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: ☐		OTHER: WELL PLUGGED AND ABANDONED 12/09/19	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

12/03/19: TAG EXISTING 5-1/2" CIBP + CMT. @ 9,980'; PUMP 25 SXS. CMT. @ 9,980'; WOC X TAG CMT. @ 9,740'.
12/04/19: PUMP 50 SXS. CMT. @ 8,925'-8,526' (PER OCD); CUT 5-1/2" CSG. @ 5,510' – NOT FREE.
12/05/19: SQZ. 90 SXS. CMT. OUT CSG. CUT @ 5,510' (PER OCD); WOC X TAG CMT. PLUG @ 5,115'.
12/06/19: CUT X PULL 5-1/2" CSG. @ 3,287'.
12/07/19: PUMP 40 SXS. CMT. @ 3,337'; WOC X TAG CMT. PLUG @ 3,164' (OK'D BY OCD).
12/08/19: PUMP 40 SXS. CMT. @ 2,018'-1,908'; PUMP 35 SXS. CMT. @ 504'; WOC X TAG CMT. @ 374' (OK'D BY OCD); MIX X CIRC. TO SURF. 30 SXS. CMT. @ 63'-3'.
12/09/19: DIG OUT X CUT OFF WELLHEAD 3' B.G.L.; WELD ON STEEL PLATE TO CSGS. X INSTALL DRY HOLE MARKER.

Approved for plugging of well bore only.
Liability under bond is retained pending receipt of C-103 Subsequent Report of Well Plugging which may be found at OCD Web Page under Forms, www.emnrd.state.nm.us/ocd.

MIRU PXA EQUIP.: 11/25/19 RDMO PXA EQUIP.: 12/09/19

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE [signature] TITLE: AGENT DATE: 12/09/19

Type or print name: DAVID A. EYLER E-mail address: DEYLER@MILAGRO-RES.COM PHONE: 432.687.3033

For State Use Only

APPROVED BY: [signature] TITLE Staff Mgr DATE 12/12/19

Conditions of Approval (if any):

APPENDIX B

GOOGLE EARTH® AERIAL IMAGERY

(1997-2023)

10/1997
1985 2023

Google Earth Imagery
10/18/1997

Well pad area prior to any land disturbance

Image U.S. Geological Survey

Google Earth

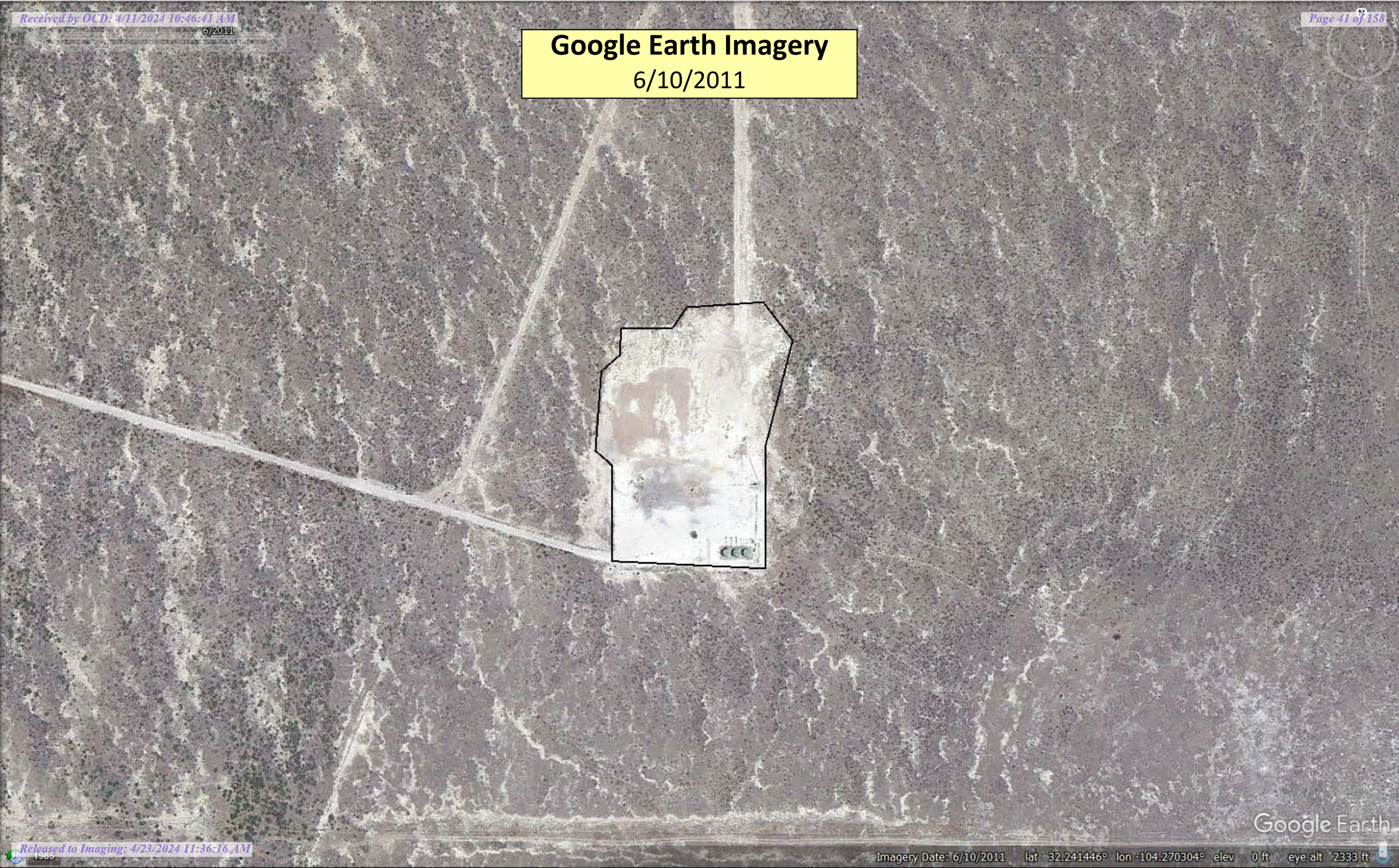
Imagery Date: 10/18/1997 lat 32.242637° lon -104.270365° elev 0 ft eye alt 2333 ft

Google Earth Imagery
6/30/2005

Google Earth Imagery
8/22/2006

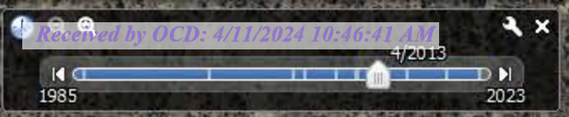
Google Earth Imagery
5/8/2009

Google Earth Imagery
6/10/2011



Google Earth Imagery

4/16/2013



Google Earth Imagery

3/12/2016

Google Earth Imagery
12/21/2019

12/2019
1985
2023

Click to move around

Google Earth

Imagery Date: 12/21/2019 lat 32.241446° lon -104.270304° elev 0 ft eye alt 2333 ft

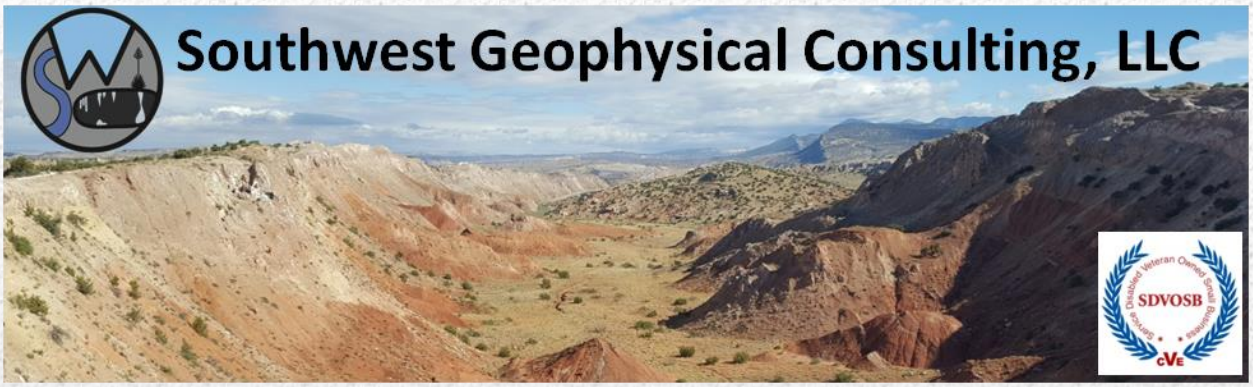
Google Earth Imagery
1/27/2023

APPENDIX C

CAVE AND KARST RESOURCE INVENTORY REPORT,

NRCS WEB SOIL SURVEY,

WATER WELL DOCUMENTATION



Cave and Karst Resource Inventory Report
Devon Campana 2M State #001
Eddy County, New Mexico

Prepared for:

eTech Environmental & Safety Solutions, Inc.
13000 West County Road 100
Odessa, TX 79765

☐ **Positive within 200 feet of release footprint**

☑ **Negative within 200 feet of release footprint**

January 23, 2024

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1.0 INTRODUCTION

An environmental aerial karst survey was commissioned by eTech Environmental and Safety Solutions, Inc. (hereinafter referred to as "the client"), on November 21, 2023, for the purpose of determining the presence of karst-related surface features within the Devon Campana 2M State #001 project site (hereinafter termed “C2MS”).

As indicated in section ***1.3 Affected Environment***, the bedrock and overlying soil at the survey site are susceptible to sinkhole development and karst features may be hidden beneath the existing soil stratum. Risk associated with sinkhole formation can be minimized during remediation by careful excavation of the spill site and the control of site hydrology. The owner/developer must recognize, however, that a risk of sinkhole-induced damage to infrastructure does exist even after remediation. If remediation measures have not already been conducted, performing a geophysical survey to determine if subsurface karst development exists for personnel and equipment safety is necessary.

1.1 Goals of this Study

To provide the client with the location and description of any surface karst-related features within the survey boundary for the C2MS project site as provided by the client via e-mail on November 27, 2023.

1.2 Summary of Findings

One high-likelihood and seven medium-likelihood surface karst features are located within the aerial survey area; however, there are no surface karst features within 200 feet of the release footprint. This location is within a Bureau of Land Management designated High Karst Occurrence Zone.

The presence of these and nearby surface features indicates that this area is karstified and may contain buried karst features. Caution should be exercised while clearing brush and during any excavation or remediation operations. Employing a Bureau of Land Management approved karst monitor on site during remediation operations should be considered. **Conducting a geophysical survey to determine if subsurface karst development exists at this location will be necessary.** Please see the section entitled ***2.4 Description of Karst Features*** and **Table 1** for a full list of the located features.

1.3 Affected Environment

The C2MS project is located in evaporite karst terrain, a landform that is characterized by underground drainage through solutionally enlarged conduits. Evaporite karst terrain may contain sinkholes, sinking streams, caves, and springs. Sinkholes leading to underground drainages and voids are common. These karst features, as well as occasional fissures and discontinuities in the bedrock, provide the primary sources for rapid recharge of the groundwater aquifers of the region.

Karst features are delicate resources that are often of geological, hydrological, biological, and archeological importance, and should be protected. The three primary concerns in these types of terrain are environmental issues, worker safety, and infrastructure integrity.

The Bureau of Land Management (BLM) categorizes all areas within the Carlsbad Field Office (CFO) zone of responsibility as having either low, medium, high, or critical cave potential based on geology, occurrence of known caves, density of karst features, and potential impacts to freshwater aquifers[1]. These designations are also recognized by the New Mexico State Land Office (NMSLO). This project occurs within a **HIGH** karst occurrence zone (HKOZ)[2] (**Figure 1**).

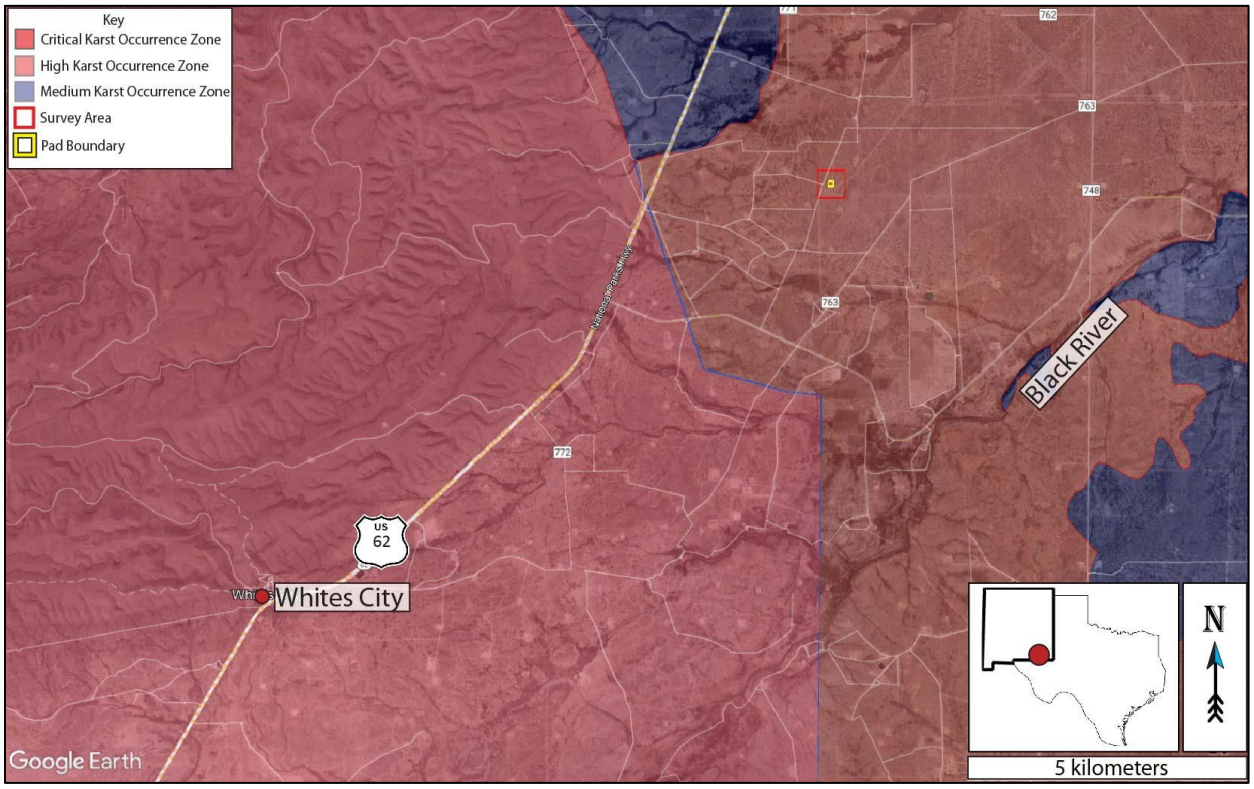

Figure 1: Karst occurrence zone overview. Background image: Google Earth. Image date: December 21, 2019. Datum: WGS-84.

A high karst occurrence zone is defined as an area in known soluble rock types that contains a high frequency of significant caves and karst features such as sinkholes, bedrock fractures that provide rapid recharge of karst aquifers, and springs that provide riparian habitat[1].

1.4 Limitations of Report

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

This report has been prepared for the use of eTech Environmental & Safety Solutions, Inc., in accordance with generally accepted consulting practices. Every effort has been made to ensure the information in this report is accurate as of the time of its writing. This report has not been prepared for use by parties other than the client, their contracting party, and their respective advisors. It may not contain sufficient information for the purposes of other parties or for other uses.

This report was prepared upon completion of the associated fieldwork using a standard template prepared by Southwest Geophysical Consulting and is based on information collected prior to fieldwork, conditions encountered on site, and data collected during the fieldwork and reviewed at the time of preparation. Southwest Geophysical Consulting disclaims responsibility for any changes that might have occurred at the site after this time. The interpreted results, locations, and depths noted in this report (if applicable) should be taken as an interpretation only and no decision should be based solely on this information. Physical verification of aerial imagery analysis results in the field should be conducted prior to conducting any remediation activities if these activities will impinge into the recommended buffers.

To the best of our knowledge, information contained in this report is accurate at the date of issue; however, conditions on the site can change in a limited time and, therefore, the information in this report shall not be used beyond three years past the date of imagery collection (see section ***2.3 Description of Survey***).

2.0 LOCATION AND DESCRIPTION OF STUDY AREA

2.1 Description of Site

The C2MS project site is located in Eddy County, New Mexico, 12.1 kilometers (7.6 miles) northeast of Whites City, New Mexico, north of Black River Village Road and nearly equidistant between US-62 and the Black River (**Figure 1** and **Figure 2**). The survey area is within the SWSW ¼ of section 2 of NM T24S R26E[3]. The region is semi-arid with an average annual precipitation of approximately 13 inches, of which about two-thirds falls as rain during summer thunderstorms from June to October. Summers are hot and sunny while winters are generally mild, with an average maximum temperature of 96°F in July and an average minimum temperature of 28°F in January[4]. This area is within the Chihuahuan Desert Thornscrub as defined by the Southwestern Regional ReGAP Vegetation map[5] and the vegetation consists mostly of areas of grass, sparse creosote, and sparse yucca, with very good visibility in most locations. See section ***2.2 Local Geology*** for the geology of the area. The project site is located entirely within an HKOZ[2] (**Figure 1**) and within NMSLO managed land[6] (**Figure 2**).

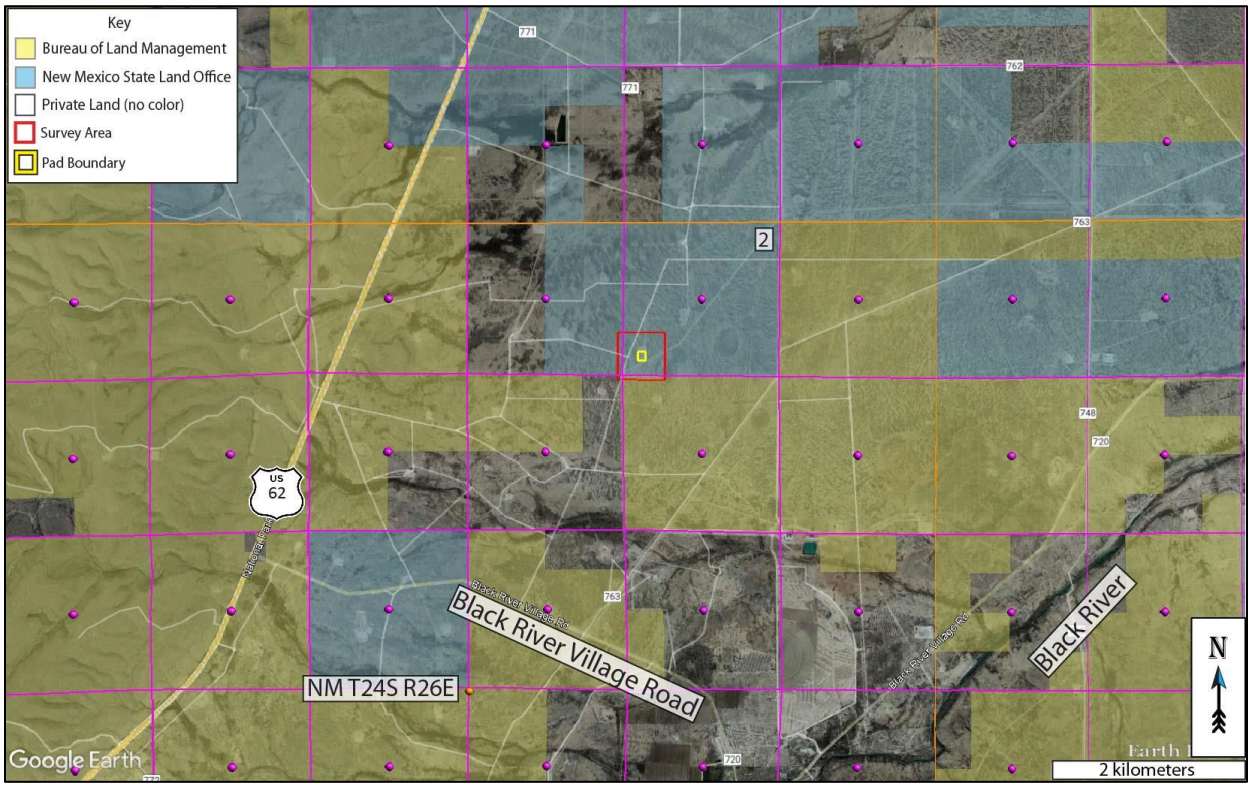

Figure 2: Land ownership[6] and PLSS[3] overview. Background image credit: Google Earth. Image date: December 21, 2019. Datum: WGS-84.

2.2 Local Geology

The area surveyed for the C2MS project is located at an elevation of 1,005 meters (3,296 feet), ± 2 meters (6.6 feet), and is underlain by the Permian Rustler Formation (Pru) and Permian Salado Formation (Psl). The area is mantled by thin gypsiferous soils and Quaternary aeolian and alluvial sands (Qal)[7] between 0 and 6 meters in depth (**Figure 3**).

The Rustler Formation is composed mainly of thin siltstones and sandstones interbedded with claystones, dolomite, and gypsum, and contains both karst-forming strata (the Forty-niner and Tamarisk members) and two shallow aquifers (the Magenta and Culebra Dolomite members)[8].

The Pru overlies the Permian Salado Formation (Psl), a layer of extremely soluble halite which can readily dissolve to create caves, sinkholes, and other karst features; however, due to its extremely soluble nature, only non-soluble silt and sand remain from the dissolution of this layer at the surface[9]. The Rustler Formation may be subject to collapse if a void has developed beneath it in the Salado Formation[10].

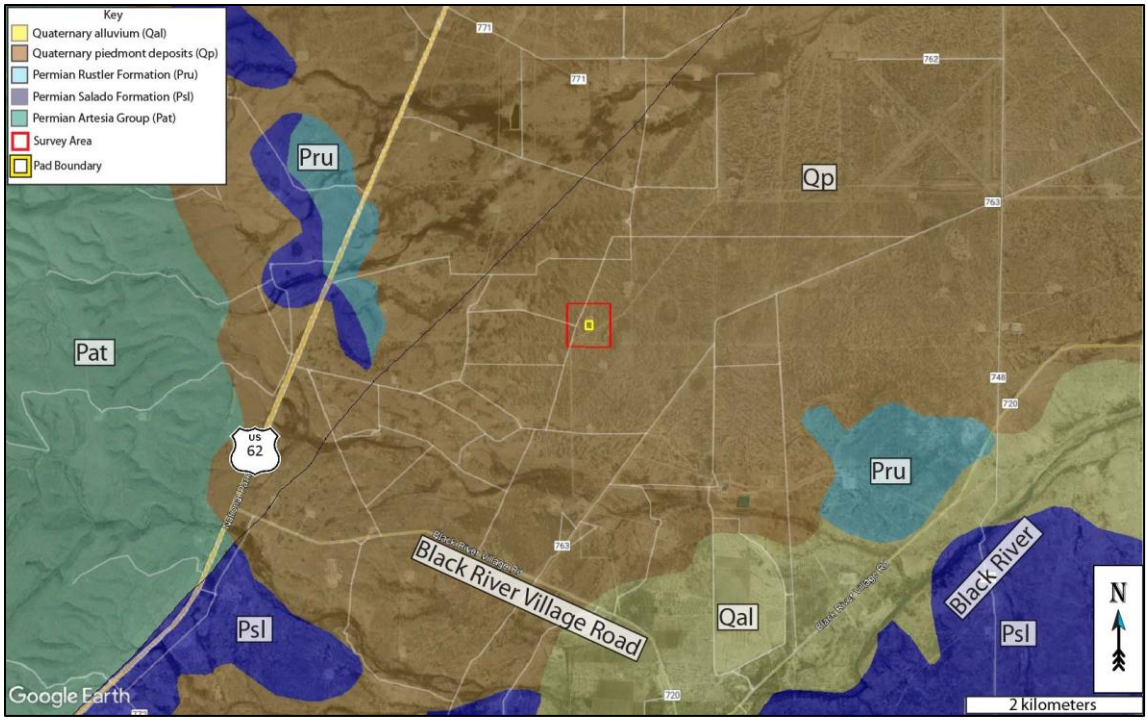

Figure 3: Geology overview. Map credit: The Digital Geologic Map of New Mexico in ARC/INFO Format[11], and Google Earth. Image date: December 21, 2019. Datum: WGS-84.

The area near the release site contains eight surface karst features, none of which are within 61 meters (200 feet) of the release delineation. Subsurface (hypogene) karst may exist. Caution is advised during any surface activities, including surface inspection, brush clearing, and remediation efforts. The survey area is covered by the easily accessible Geologic Map of New Mexico (2003) at 1:500,000 scale [7].

2.3 Description of Survey

Southwest Geophysical Consulting, in partnership with SWCA Environmental Consultants, provides aerial karst surveys using drones that are flown by qualified, FAA licensed drone pilots and that meet the stringent Bureau of Land Management – Carlsbad Field Office requirements for both pedestrian and aerial karst surveys.

Aerial karst surveys are conducted at low elevation following a preplanned raster pattern flightpath designed for the purpose of generating at least 75% imagery overlap. The collected high-resolution, georeferenced imagery is stitched together to develop orthomosaic imagery which is further developed into a digital elevation model (DEM); the DEM is then processed into a local relief model (LRM) (**Figure 4**). This LRM is color coded to enhance differences in elevation of as little as five centimeters. The orthoimagery, DEM, and LRM are uploaded to a server where they are analyzed by a highly qualified karst geologist. Finally, the data is reviewed by a senior karst geologist for quality assurance and downloaded into a table for inclusion in a written report[12].

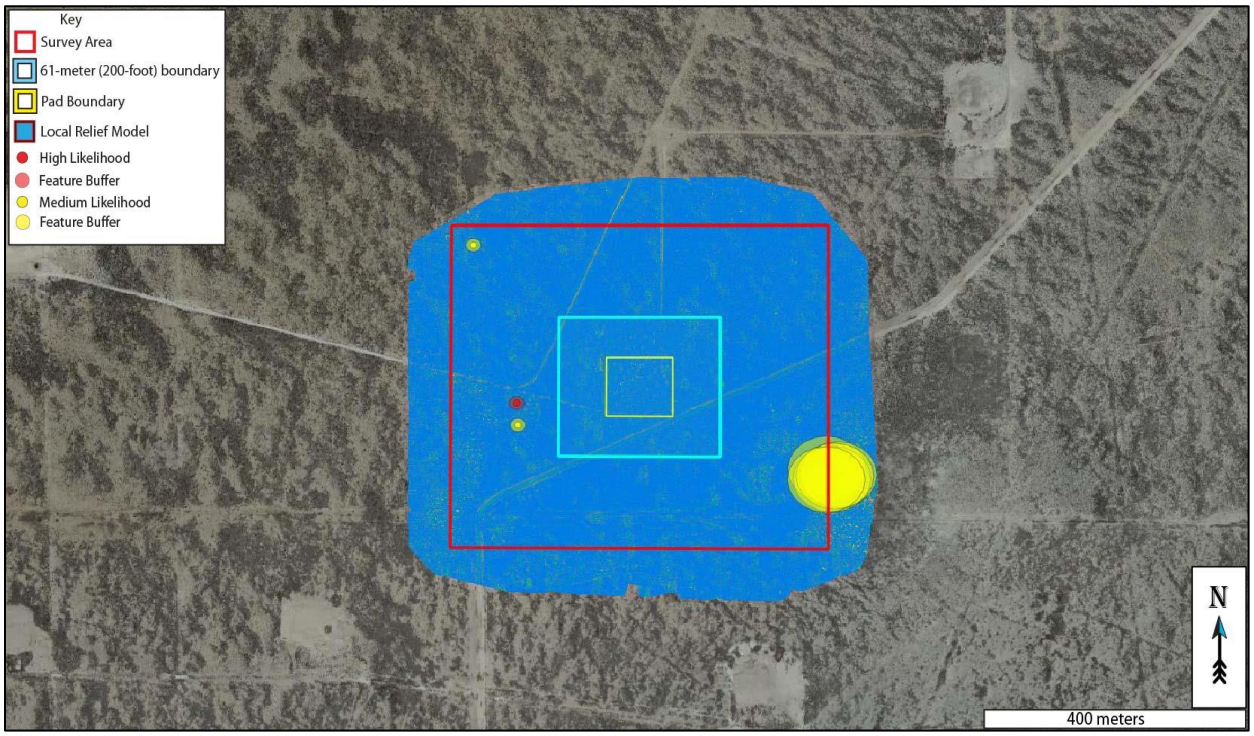

Figure 4: Survey overview. Background image credit: Google Earth. Image date: December 21, 2019. Datum: WGS-84.

Resolution of the orthoimagery is clear enough that features as small as 10 centimeters can be positively identified in most circumstances. Occasionally there are ambiguous features identified during an aerial survey that will need to be checked in the field if they are impacted by the release. Specifically, it is difficult to tell the difference between solution tubes, abandoned uncased well bores, and some burrows in drone imagery[13]. These features are marked with yellow dots in **Figure 4**. If a feature of any type is subsequently verified in the field prior to publication of the report, the dot will be changed to red triangle if confirmed as a karst feature or deleted if not.

The imagery for the C2MS study was collected via aerial survey by Pat Lagodney of SWCA on December 12, 2023. Surface karst features may have developed after this date and will not be noted in this report. Imagery analysis was completed by Dave Decker of Southwest Geophysical Consulting on January 8, 2024.

Prior to conducting the aerial karst surveys, a surface karst desk study was performed by Southwest Geophysical Consulting. The study was performed using satellite and aerial imagery from Google Earth Pro dated December 21, 2019 (please note features less than one meter in diameter are generally not visible); the Southwest Geophysical Cave and Karst Database dated August 21, 2023; and the Black River Village, NM, 1:24,000 quad, 1979, USGS topographic map. Please note that we use older topographic maps because newer maps have had caves removed from them. These searches and queries returned no results within the survey boundary.

2.4 Description of Karst Features

One high-likelihood surface karst feature is located within the aerial survey area (**Figure 4**, **Table 1**). High-likelihood surface karst features are features that are positively identified in either satellite or aerial imagery as karst features but have not been field checked.

Seven medium-likelihood surface karst features are located within the aerial survey area (**Figure 4**, **Table 1**). Medium-likelihood surface karst features are ambiguous in aerial imagery and should be site-checked for verification if they impact the facility's location. The features identified in this report as medium likelihood are probably burrows or shadows, or erosional in nature; however, there is insufficient evidence to make this determination and therefore these features cannot be ruled out.

None of these surface karst features are within 200 feet (61 meters) of the release perimeter. **These features and any potential hydrologic pathways into them should be considered during site remediation planning** (**Figure 4**, see section **3.0 RECOMMENDATIONS** for further information).

Caution should be exercised while operating in or around all karst-related features due to the possibility of near-surface voids. Please be aware that the area may contain buried karst features outside of these areas. Caution is advised while clearing brush and during trenching and excavation activities outside of these zones. Employing a BLM-CFO approved karst monitor on site during these activities should be considered. **To check the area for subsurface karst development (prove stable ground at this location), a geophysical survey within the horizontal delineation of the release must be conducted.**

Table 1 contains a list of features identified during the aerial karst survey and subsequent imagery analysis. Each feature is identified with a feature identification number (Feature ID), the type of feature, estimated size (in meters), recommended buffer (in meters), the likelihood of this feature being a surface karst feature (modifiers H/M for high or medium likelihood, V for field verified), and its location in WGS-84/UTM-13 (EPSG: 32613).

Table 1: Karst Feature Data Table

Feature ID	Type	Size (m)	Buffer (m)	Modifier	Easting	Northing
PKF 240108-D01	Suffosion sinkhole	0.3	10	M	568520.684	3567611.589
PKF 240108-D02	Suffosion sinkhole	0.5	10	H	568578.124	3567373.011
PKF 240108-D03	Suffosion sinkhole	0.4	10	M	568579.881	3567339.619
PKF 240108-D04	Swallet	1.0	50	M	568977.552	3567275.603
PKF 240108-D05	Swallet	0.8	50	M	568992.784	3567267.402
PKF 240108-D06	Swallet	0.9	50	M	568984.713	3567260.530
PKF 240108-D07	Swallet	0.8	50	M	568988.506	3567265.106
PKF 240108-D08	Collapse feature	0.9	50	M	568977.382	3567259.772

NOTE: Location data provided in WGS-84/UTM 13S. PKF – possible karst feature.

3.0 RECOMMENDATIONS

3.1 Summary

- One high-likelihood and seven medium-likelihood surface karst features are located within the aerial survey area.
- None of these surface karst features are within 200 feet (61 meters) of the release perimeter.
- **Consider these features and whether surface flow may impact or has already impacted them during site and remediation planning.**
- **To check the area for subsurface karst development (prove stable ground at this location), a geophysical survey within the horizontal delineation of the release must be conducted.**
- The presence of these and other nearby surface karst features indicates that this area is karstified and may contain buried karst features.
- Caution should be exercised while clearing brush and during any excavation, trenching, drilling, or remediation operations.
- Employing a BLM-CFO approved karst monitor during excavation or remediation operations near these features should be considered.

3.2 Best Practices

Because of the ambiguous nature of the medium-likelihood surface karst features found in the survey area, caution should be used while working in or near feature buffer zones. **Please be advised that any remediation operations conducted within a medium-likelihood surface karst feature buffer will require a field verification by a BLM-CFO approved karst vendor to confirm the nature of these features.**

This area may be prone to rapid karst formation in the underlying stratigraphy and warrants careful planning and engineering to mitigate karst-forming processes that could be accelerated by poor planning and considerations. Proper practices following karst guidelines should be implemented during all phases of remediation. Mitigation measures for any karst features revealed during excavation or drilling shall be approved by the Bureau of Land Management – Carlsbad Field Office and follow the Natural Resources Conservation Service Conservation Practice Standard for Karst Sinkhole Treatment, Code 527, or the Bureau of Land Management Cave and Karst Management Handbook, H-8380-1.

Keep in mind that any flow of gypsum-undersaturated waters into a small crack or crevice can rapidly dissolve any underlying gypsum and cause failure of an impoundment or infrastructure within a matter of months to a few years.

Vigilance during remediation is paramount. If voids are encountered during excavation or drilling, contact the Bureau of Land Management Karst Division at (575) 234-5972, the New Mexico State Land Office Surface Resources Division at (505) 827-5768, or a BLM-CFO approved karst vendor and request an on-site investigation from a karst expert if one is not already on site. A karst consultant can generally be available in Eddy County within five hours.

Approved karst monitors should have karst feature identification training, at least two years of supervised experience identifying karst features, wilderness first aid training, SRT training, confined space training, gas monitor training, and a minimum of SPAR cave rescue training through NCRC. They should have with them the proper gear and be prepared both physically and mentally to enter a collapse feature within minutes to perform a rescue if needed. Monitoring services with qualified karst monitors, as well as cave surveys and geophysical surveys, are available from Southwest Geophysical Consulting.

Under no circumstances should an untrained, inexperienced person enter a cave, pit, sinkhole, or collapse feature. All field employees of Southwest Geophysical Consulting have extensive caving experience and the ability to determine whether entry into a karst feature is safe or presents a hazard. In the event it is necessary to enter a karst feature, Southwest Geophysical Consulting can provide these services on request.

Cave and karst resource inventory reports for the BLM-CFO should be submitted to:

blm_nm_karst@blm.gov

Cave and karst resource inventory reports for the NMSLO should be submitted to the respective project manager.

4.0 REFERENCES

1 Goodbar, J. R. Vol. BLM Management Handbook H-8380-1 (ed Carlsbad Field Office) 59 (Bureau of Land Management, Denver, CO, 2015).

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4 W.R.C.C. *National Climate Data Center 1981-2010 Normal Climate Summary for Carlsbad, New Mexico (291469)*. (2010).

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13 Decker, D. D. & Jorgensen, G. L. (ed LLC Southwest Geophysical Consulting) (Private Correspondence, 2020).

5.0 GLOSSARY OF TERMS AND ABBREVIATIONS

BLM-CFO	Bureau of Land Management - Carlsbad Field Office
caprock-collapse sinkhole	Collapse of roof-spanning rock into a cave or void.
cave	Natural opening at the surface large enough for a person to enter.
cover-collapse sinkhole	Collapse of roof-spanning soil or clay ground cover into a subsurface void.
GPS	Global Positioning System
grike	A solutionally enlarged, vertical, or sub-vertical joint or fracture.
(H)	High confidence modifier for a PKF. This is typically reserved for a feature that is definitely karst but has not been confirmed in the field.
HKOZ	High Karst Occurrence Zone
InSAR	Interferometric Synthetic Aperture Radar. A method by which radar signals from satellites are processed to determine the amount and rate of subsidence of an area as well as whether the area is actively subsiding.
(L)	Low confidence modifier for a PKF. This is typically a feature that cannot be ruled out as karst but is most likely NOT karst related. This modifier may also be used for pseudokarst features.
LED	Locally enclosed depression. A natural depression on the surface that collects rainwater. Some contain swallets and/or caves, others do not.
LKOZ	Low Karst Occurrence Zone
(M)	Medium confidence modifier for PKF. This is an ambiguous feature that can't be positively identified as karst without a field visit (e.g., burrows, abandoned unlined wells, solution tubes, pseudokarst).
MKOZ	Medium Karst Occurrence Zone
NCRC	National Cave Rescue Commission
NKF	Non-karst feature. Used for features originally identified as PKF that have been subsequently identified in the field as non-karst related. This term may also be used for pseudokarst features.
NMSLO	New Mexico State Land Office
Pat	Permian Artesia Group
Pdl	Permian Dewey Lake Formation
PKF	Possible karst feature. This term is reserved for features identified in satellite or aerial imagery that have NOT been visited in the field. Further modifiers include (H) for high confidence, (M) for medium confidence, and (L) for low confidence. These confidence levels are based on field experience.
PLSS	Public Land Survey System

Pqg	Permian Queen/Greyburg Formation
Pru	Permian Rustler Formation
pseudokarst	Karst-like features (sinkholes, conduits, voids etc.) that are not formed by dissolution. These types of features include soil piping, lava tubes, and some cover-collapse and suffosion sinkholes.
Psl	Permian Salado Formation
Psr	Permian Seven Rivers Formation
Pt	Permian Tansill Formation
Py	Permian Yates Formation
Qal	Quaternary alluvium
Qp	Quaternary piedmont deposits
Qpl	Quaternary playa lake deposits
RKF	Recognized karst feature. This term is reserved for karst features that have been physically verified in the field.
SKF	Surface Karst Feature
SPAR	Small Party Assisted Rescue
suffosion sinkhole	Raveling of soil into a pre-existing void or fracture.
swallet	A natural opening in the surface, too small for a person, that drains water to an aquifer. Some are "open," meaning a void can be seen below; some are "closed, "meaning they are full of sediment.
SWG	Southwest Geophysical Consulting, LLC
UTM	Universal Transverse Mercator (projected coordinates)
(V)	Field verified modifier for a PKF. This indicates that the feature has been visited by a qualified karst professional in the field and fully identified
WGS	World Geodetic System (geographic coordinates)

6.0 ATTESTATION

David D. Decker, PhD, PG, CPG
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dave@swgeophys.com
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CERTIFICATE OF AUTHOR

I, David D. Decker, a Licensed Professional Geologist and a Certified Professional Geologist, do certify that:

- I am currently employed as a consulting geologist in the specialty of caves and karst with an office address of 5117 Fairfax Dr. NW, Albuquerque, NM, USA, 87114.
- I graduated with a Master of Science in Applied Physics with a specialization in Sensor Systems from the Naval Post Graduate School in Monterey, California, in 2003, and a Doctor of Philosophy in Earth and Planetary Sciences from the University of New Mexico, Albuquerque, New Mexico, in 2018.
- I am a Licensed Professional Geologist in the State of Texas, USA (PG-15242) and have been since 2021. I am a Certified Professional Geologist through the American Institute of Professional Geologists (CPG-12123) and have been since 2021.
- I have been employed as a geologist continuously since 2016. I was previously employed as a Fire Controlman, Naval Flight Officer, and Aerospace Engineering Duty Officer in the U.S. Navy and operated, maintained, and installed various sensor systems including magnetic, electromagnetic, radar, communications, and acoustic systems in various capacities from 1986 through 2010.
- I have been involved in various aspects of cave and karst studies continuously since 1985, including exploration, mapping, and scientific studies.
- I have read the definition of “qualified karst professional” set out in the ASTM Standard (currently in review). I meet the definition of “qualified professional” for the purposes of ASTM E-1527.
- I am responsible for the content, compilation, and editing of all sections of report number ETEC-005-20231121 entitled, “Cave and Karst Resource Inventory Report, Devon Campana 2M State #001, Eddy County, New Mexico.” I or a duly authorized and qualified representative of Southwest Geophysical Consulting, LLC, have personally visited this site or reviewed the aerial imagery on the date or dates mentioned in section ***2.3 Description of Survey***.

- I have no prior involvement nor monetary interest in the described property or project, save for my fee for conducting this investigation and providing the report.

Dated in Albuquerque, New Mexico, January 23, 2024.

David D. Decker
PhD, CPG-12123

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eddy Area, New Mexico

Campana 2M State #001

May 31, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,380 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 12, 2022—Dec 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RA	Reagan loam, 0 to 3 percent slopes	9.7	100.0%
Totals for Area of Interest		**9.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eddy Area, New Mexico

RA—Reagan loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 1w5c
Elevation: 1,100 to 4,400 feet
Mean annual precipitation: 7 to 14 inches
Mean annual air temperature: 60 to 70 degrees F
Frost-free period: 200 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Reagan and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reagan

Setting

Landform: Fan remnants, alluvial fans
Landform position (three-dimensional): Rise
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Alluvium and/or eolian deposits

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Minor Components

Atoka

Percent of map unit: 1 percent

Ecological site: R070BC007NM - Loamy
Hydric soil rating: No

Upton

Percent of map unit: 1 percent
Ecological site: R070BC025NM - Shallow
Hydric soil rating: No

CLEAN OUT

Revised June 1972

STATE ENGINEER OFFICE

WELL RECORD

Section 1. GENERAL INFORMATION

(A) Owner of well WALKER Hood % EUGENE Hood Owner's Well No. C-2174
Street or Post Office Address 1142 BLACK River VLG. Rd
City and State CARLSBAD, N.M. 88220

Well was drilled under Permit No. C-2174 and is located in the:

a. ____ ¼ NE ¼ S ¼ W ¼ of Section 10 Township 24-S Range 26-E N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor EDGAR MABRY License No. WD-969
Address 81 KELLY Rd. CARLSBAD, N.M. 88220

Drilling Began 5-3-89 Completed 5-10-89 Type tools CABLE Size of hole 6 in.

Elevation of land surface or ____ at well is ____ ft. Total depth of well 263 ft.

Completed well is ☐ shallow ☐ artesian. Depth to water upon completion of well 233 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)

Section 3. RECORD OF CASING

NONE

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor ____
Address ____
Plugging Method ____
Date Well Plugged ____
Plugging approved by:
____
State Engineer Representative

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			
3			
4			

FOR USE OF STATE ENGINEER ONLY

Date Received May 18, 1989

Quad ____ FWL ____ FSL ____

File No. C-2174 Use Stock Location No. 24.26.10.32413

CLEAN OUT 24.26.10.32413

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
238	263	25	SAND & GRAVEL

Section 7. REMARKS AND ADDITIONAL INFORMATION

I Cleaned out 25' foot of sand and Gravel Back to Bottom of old well

89 MAY 18 AM 8 10
STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above described hole.

Edgar W Mayhew
Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district office of the State Engineer. All questions, except Section 5, shall be answered as completely and accurately as possible when any well is drilled for any purpose. If this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NUMBER (WELL NUMBER): C-4051	OSE FILE NUMBER(S):
WELL OWNER NAME(S): David Maley	PHONE (OPTIONAL):
WELL OWNER MAILING ADDRESS: Po Box 2459	CITY: Carlsbad STATE: NM ZIP: 88220

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	15	23.8	N
LONGITUDE	104	16	16.1	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:

2. DRILLING & CASING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1690	Jason Maley	Vision Resources Inc

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
5-13-17	5-15-17	294	360	340

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): 233

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	234	10	pvc sd 40	spline	6	.2	
234	294	10	pvc sd 40	spline	6	.2	.034

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	40	10	neat cement	12.5	pump
40	294	10	pea gravel	78	tag line

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 10/29/15)

FILE NUMBER	C-4051	POD NUMBER		TRN NUMBER	605955
LOCATION	23S.26E.35.3.3.1			Livestock	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	DEPTH (feet bgl) 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	80	80	tan silty clay	Y (N)	
80	90	10	tan clay with gray gravels	Y (N)	
90	180	90	tan clay with some gravel	Y (N)	
180	290	110	tan silty clay with some gravel	Y (N)	
290	340	50	tan clay with some sand	Y (N)	
340	360	20	gray conglomerate cemented gravels	(Y) N	100
				Y N	
				Y N	
				Y N	
				Y N	
				Y N	
				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): 100 / 0.00

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:

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

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:

Jason Maley — 5-16-17

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 10/29/2015)

FILE NUMBER	C-4051	POD NUMBER	1	TRN NUMBER	605955
LOCATION	23S.26E.35.3.3.1			Livestock	PAGE 2 OF 2

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2010 APR 30 P 1:26

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER): C-03414-POD1	OSE FILE NUMBER(S): C-3414
WELL OWNER NAME(S): DeBrah c/o Modrall for → June Nichols	PHONE (OPTIONAL): 575-885-2731
WELL OWNER MAILING ADDRESS: 711 North olive	CITY: Carlsbad STATE: Nm ZIP: 88220

WELL LOCATION (FROM GPS): ** LATITUDE 32° 13.273 N; LONGITUDE 104° 15.745 W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS: West of house

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
SE ¼	SW ¼	NW ¼	NE ¼	14	24 ☐ NORTH ☒ SOUTH	26 ☒ EAST ☐ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT

HYDROGRAPHIC SURVEY	MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD1541	Travis Mann	Will Crockett

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4-26-10	4-28-10	80	77/8	60

COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED) — STATIC WATER LEVEL IN COMPLETED WELL (FT): 50

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

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

DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
0	80	7 7/8	4" PVC	Slip Joint	4"	1/4"	.020

4. WATER BEARING STRATA

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)
60	75	15	Sand and gravel	15

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: Bailer

TOTAL ESTIMATED WELL YIELD (GPM): 15

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	C-3414	POD NUMBER	C-03414-POD1	TRN NUMBER	470098
LOCATION		24.26.14.21343323		PAGE 1 OF 2	

** 32°13'16.38" X -104°15'44.70"

5. SEAL AND PUMP

TYPE OF PUMP: ☒ SUBMERSIBLE ☐ JET ☐ NO PUMP – WELL NOT EQUIPPED
☐ TURBINE ☐ CYLINDER ☐ OTHER – SPECIFY:

ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
	0	20	7 7/8	Cement	25	Poured
	20	90	7 7/8	Gravel	65	shoveled

6. GEOLOGIC LOG OF WELL

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?
0	20	20	Caliche	☐ YES ☒ ~~NO~~
20	46	26	Gravel	☐ YES ☐ NO
46	53	7	sand	☐ YES ☒ ~~NO~~
53	60	7	sand and gravel	☐ YES ☒ ~~NO~~
60	75	15	80% gravel 20% sand	☒ ~~YES~~ ☐ NO
75	80	5	gravel	☐ YES ☒ ~~NO~~
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO

WELL TEST — METHOD: ☒ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER – SPECIFY:

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

ADDITIONAL STATEMENTS OR EXPLANATIONS:

Lost circulation at 19 Ft cemented to gain circulation
Back

adjacent to C-1408

8. 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:

Travis Mac — SIGNATURE OF DRILLER

4-28-10 — DATE

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	C-3414	POD NUMBER	C-03414-POD1	TRN NUMBER	470098
LOCATION	24.26.14.213433323			PAGE 2 OF 2	

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO
2012 JUL 16 P 2:58

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER): C-3414	OSE FILE NUMBER(S):
WELL OWNER NAME(S): Debrah Modrall	PHONE (OPTIONAL): 575-200-5580
WELL OWNER MAILING ADDRESS: 83 Bounds Rd.	CITY: Carlsbad STATE: NM ZIP: 88220

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	13	18.40	N
LONGITUDE	104	15	44.40	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND
* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS: Well is about 150' from house.

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
¼	¼	¼	¼		☐ NORTH ☐ SOUTH	☐ EAST ☐ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT

HYDROGRAPHIC SURVEY	MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD-1348	Clinton E Taylor	Taylor Water Well Service

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
2/27/12	2/28/12	92	100	61

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): 32

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

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

DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
+1.5	52	7 7/8	PVC	Spline	4.5	SDR-17	
52	92	7 7/8	PVC	Spline	4.5	SDR-17	.032

4. WATER BEARING STRATA

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)
61	92	31	Anhydrite and Siltstone	2

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA	TOTAL ESTIMATED WELL YIELD (GPM)
Pumping	2

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	C-3414	POD NUMBER	2	TRN NUMBER	495240
LOCATION	Dom/Repl	24S.26E.14.213		PAGE 1 OF 2	

5. SEAL AND PUMP

TYPE OF PUMP: ☑ SUBMERSIBLE ☐ JET ☐ NO PUMP – WELL NOT EQUIPPED
☐ TURBINE ☐ CYLINDER ☐ OTHER – SPECIFY:

ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT) FROM	DEPTH (FT) TO	BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
	0	20	9	Bentonite Grout	2 Sacks	Tremie
	20	92	7 7/8	Pea Gravel	1 Yard	Dump

6. GEOLOGIC LOG OF WELL

DEPTH (FT) FROM	DEPTH (FT) TO	THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?
0	8	8	Soil	☐ YES ☑ NO
8	18	10	Clay:rd,pnk,sndy	☐ YES ☑ NO
18	24	6	Conglomeratebrn,yel brn,gry,pnk,lmy,sme sndy	☐ YES ☑ NO
24	61	37	Clay:lt rd,smth,stky	☐ YES ☑ NO
61	96	35	Anhydrite:wht,frstd,gry,vfn xln-dns,sme layers of gry siltstone,small	☑ YES ☐ NO
			amount of water	☐ YES ☐ NO
96	100	4	Clay:rd,sndy in prt	☐ YES ☑ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO

WELL TEST
METHOD: ☐ BAILER ☑ PUMP ☐ AIR LIFT ☐ OTHER – SPECIFY:
TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

ADDITIONAL STATEMENTS OR EXPLANATIONS:

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO
2012 JUL 18 P 2:58

8. 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:

SIGNATURE OF DRILLER — DATE: 7/16/2012

FOR OSE INTERNAL USE — WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER C-3414	POD NUMBER	TRN NUMBER 495240
LOCATION		PAGE 2 OF 2

APPENDIX D

DELINEATION FIELD NOTES

9/9/2021 WPX Campana ZM State #1

TH-1

0-4 Red brown clay, no st, no od, dry to sl moist

4-5.5 Light to dark gray clay, sl to heavy st, sl od to no od, sl moist to moist, some greenish staining, some large pieces of liner

5.5-6 Red brown clay w/ white gypsum, more consolidated, no st, no od, sl moist

6-13 Red brown clay w/ decreasing white gypsum, increasingly consolidated, no od, no st, sl moist.

TH-2

0-5 Red brown clay w/ increasing white gypsum, no od, no st, dry to sl moist

5-6 Red brown clay, more consolidated, more gypsum, no od, no st

TH-3

0-1 white and tan clay, no od, no st, dry to sl. moist

1-2 Dark brown and gray clay, sl od, sl to heavy st

2-6 Red brown clay w/ white gypsum, no od, no st, sl moist, decreasing gypsum after 4 ft, increasing consolidation after 4 ft

TH-4

0-4.5 Red brown clay w/ white gypsum, no od, no st, dry to sl. moist, increasing gypsum after 3 ft

4.5-6 Red brown clay w/ little white gypsum, more consolidated, no od, no st, sl moist

TH-5

0-2 Red brown clay w/ gravel @ surf., no od, no st, dry to sl moist

2-4.5 Red brown clay, increasing gypsum

no od, no st, sl. moist

4.5-8 Red brown clay, no od, no st, increasingly consolidated, sl moist

TH-6

0-3.5 Red brown clay w/ some gray pieces, no od, no st (besides gray pieces), sl. moist

3.5-5.5 Dark gray clay, sl. od, heavy st, sl. moist, pieces of liner

5.5-10 Light gray grading to brown clay, sl. od to no od, sl st to no st, sl moist

TH-7

0-3 Mixed red brown clay w/ green and gray clay, some cobble size rocks, sl od to no od, mod st to no st, liner appears in place but is not horiz., dry to moist.

3-6 Red brown clay w/ some white gypsum no od, no st, sl. moist

TH-8

0-3 mixed red brown clay w/ lt green and gray clay, some cobble size rocks, sl od to no od, mod st to no st, pieces of liner, sl. moist

3-6 Red brown clay w/ some white gypsum. no od, no st, sl. moist

6-9.5 Red brown clay, more consolidated, no od, no st, sl moist

TH-9

0-3.5 Red brown clay, no od, no st, dry to sl. moist

3.5-6 Red brown clay w/ white gypsum, increasing consolidation, no od, no st, sl. moist to dry

TH-10

0-3.5 Red brown clay, no od, no st, dry to sl. moist

3.5-6 Red brown clay w/ white gypsum, more consolidated, no od, no st, dry to sl. moist.

TH-11

0-4 Mixed red brown clay w/ green, gray and yellow clay, no od, no st, sl. moist

4-5 Red brown clay, more consolidated, no od, no st, sl. moist

5-10 Light gray clay grading to red brown clay, increasing consolidation, no od, sl to no st, sl. moist

TH-12

0-3 Red brown clay, no od, no st, dry to sl moist

3-6 Red brown clay grading to lt gray clay around left, no od, no st to sl st, dry to sl. moist, increasing consolidation

TH-13

0-3 Red brown clay, no od, no st, dry to sl. moist

3-6 Red brown clay w/ white gypsum, no od, no st, sl. moist to dry, increasingly consolidated.

TH-14

0-4 Light gray clay grading to red brown clay w/ white gypsum, no od, sl to no st, dry to sl. moist

4-6 Red brown clay, more consolidated, no od, no st, sl. moist

TH-15

0-4 Light gray clay grading to red brown clay w/ white gypsum, no od, sl to no st, dry to sl. moist

4-10 Red brown clay w/ decreasing white gypsum, increasing consolidation, no od, no st, sl. moist

TH-16

0-0.25 Gravel and cobbles w/ gray clay, no od, no st, dry

0.25-2 Yellowish tan clay, no od, no st, sl. moist

2-6 Grayish tan clay, no od, no st, sl moist

TH-17

0-2 Red brown clay w/ gravel @ surface, no st, no od, dry to sl moist

2-4 Red brown clay w/ some white gypsum, no od, no st, sl. moist

4-6 Red brown clay, more consolidated, no od, no st, sl moist

Field EC Screening

Sample	Depth	EC	Temp °C
TH-1	Surface	20.00	16.3
	2	5.63	16.3
	6	1.89	16.6
	8	1.17	16.4
	10	1.64	19.0
	11.5	0.32	18.7
TH-2	Surface	0.16	16.7
	2	0.13	16.5
TH-3	Surface	20.00	16.8
	2	0.76	16.5
	4	0.45	16.4
	6	0.31	16.6
TH-4	Surface	0.35	16.8
	6	0.14	16.3
TH-5	Surface	12.61	17.0
	6	0.77	16.7
	8	0.25	19.4
TH-6	Surface	20.0	17.1
	6	2.08	17.0
	8	1.55	18.7
	10	0.92	18.6
TH-7	Surface	8.08	17.3
	6	1.24	17.1
TH-8	Surface	8.16	17.4
	6	1.15	16.9
	8	1.55	18.6
	9.5	0.25	18.4
TH-9	Surface	2.87	18.6
	2	0.37	20.5
	6	0.15	18.4
TH-10	Surface	0.42	18.5
	6	0.18	18.5
TH-11	Surface	20.0	17.5
	6	4.71	17.9
	8	2.94	19.8
	10	2.40	18.8

Sample	Depth	EC	Temp
TH-12	Surface	20.0	17.5
	2	1.33	20.0
	4	0.14	19.4
	6	0.31	18.0
TH-13	surface	0.20	18.0
	6	0.19	17.5
TH-14	surface	3.17	18.7
	2	0.57	19.0
	4	0.25	18.8
	6	0.28	18.2
TH-15	surface	13.23	19.4
	2	3.19	18.6
	4	2.13	18.8
	6	1.60	18.3
	8	0.26	18.4
	10	0.36	18.2
TH-16	surface	0.58	19.1
	2	0.25	18.7
	6	0.11	18.2
TH-17	surface	6.49	19.3
	2	0.60	19.0
	4	0.46	19.2
	6	0.38	19.2

3/10/21 WPX Campana 2M State #1

TH-18

0-2 Red brown clay w/ gravel @ surface, no od, no st, dry to sl. moist

2-4 Red brown clay w/ some gypsum, no od, no st, sl. moist, more consolidate @ 4'

TH-19

0-2 Red brown clay w/ gravel @ surface, no od, no st, dry to sl moist

2-4 Red brown clay w/ some gypsum, no od, no st, sl moist, more consolidated @ 4'

TH-20

0-1.5 Red brown clay w/ some concrete wash-out @ surface, no od, no st, dry to sl. moist

1.5-4 Red brown clay w/ gypsum, no od, no st, dry to sl. moist

TH-21

0-4 Red brown clay w/ some white gypsum, no od, no st, sl. moist, more consolidated @ 4', gravel @ surf.

TH-22

0-3.5 Red brown clay, no od, no st, dry to sl. moist

3.5-4 Red brown clay w/ white gypsum, no od, no st, sl. moist, more consolidated

TH-23

0-3 Red brown clay, no od, no st, dry to sl moist

3-4 Red brown clay w/ white gypsum, no od, no st, sl moist, more consolidated

BG-1

0-4 Red brown clay w/ white gypsum, no od, no st, dry to sl. moist

Field EC Screening

Sample	Depth	EC	Temp
TH-18	Surface	0.63	20.5
	2	0.20	18.9
	4	0.25	19.1
TH-19	Surface	0.08	24.5
	2	0.10	18.9
	4	0.09	19.2
TH-20	Surface	0.21	18.6
	2	0.45	18.9
	4	0.40	18.9
TH-21	Surface	0.72	18.7
	2	1.19	18.9
	4	1.45	19.9
TH-22	Surface	2.24	19.4
	2	2.22	19.0
	4	2.60	18.7
TH-23	Surface	0.13	19.2
	2	0.29	19.0
	4	0.12	18.8
BG-1	Surface	0.12	19.3
	2	0.31	18.9
	4	0.13	19.0

APPENDIX E

SAMPLING PROTOCOL

Souder, Miller & Associates ♦ 201 S. Halagueno ♦ Carlsbad, NM 88220
(575) 689-8801

Sampling Protocol

The soil samples are collected in laboratory supplied containers in accordance with this sampling protocol, immediately placed on ice and sent under standard chain-of-custody protocols to the selected laboratory for analysis. The samples may be analyzed for total chloride using EPA Method 300.0; benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8021B; and motor, diesel, and gasoline range organics (MRO, DRO, and GRO) by EPA Method 8015D.

Sampling Analysis Field Quality Assurance Procedures

A unique sample numbering is used to identify each sample collected and designated for on-site field screening and off-site laboratory analysis. The purpose of this numbering scheme is to provide a tracking system for the retrieval of analytical and field data for each sample. Sample identification numbers are recorded on sample labels or tags, field notes, chain-of-custody records (COC) and all other applicable documentation used during the project. Sample labels are affixed to all sample containers during sampling activities. Information is recorded on each sample container label at the time of sample collection. The information recorded on the labels are as follows: sample identification number; sample type (discrete or composite); site name and area/location number; analysis to be performed; type of chemical preservative present in container; date and time of sample collection; and sample collector's name and initials. All samples are packed in ice in an approved rigid body container, custody sealed signed and shipped to the appropriate laboratory via insured currier service.

COC procedures implemented for the project provide documentation of the handling of each sample from the time of collection until completion of laboratory analysis. A COC form serves as a legal record of possession of the sample. A sample is considered under custody if one or more of the following criteria are met: the sample is in the sampler's possession; the sample is in the sampler's view after being in possession; the sample was in the sampler's possession and then was placed into a locked area to prevent tampering; and/or the sample is in a designated secure area. Custody is documented throughout the project field sampling activities by a chain-of custody form initiated each day during which samples are collected. Container custody seals placed on either individual samples or on the rigid body container are used to ensure that no sample tampering occurs between the time the samples are placed into the containers and the time the containers are opened for analysis at the laboratory. Container custody seals are signed and dated by the individual responsible for completing the COC form contained within the container.

APPENDIX F

LABORATORY ANALYTICAL REPORT

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

April 08, 2021

Heather Woods

Souder, Miller and Associates
401 W. Broadway
Farmington, NM 87401
TEL: (505) 325-5667
FAX (505) 327-1496

RE: WPX Campana 2M State 1 OrderNo.: 2103633

Dear Heather Woods:

Hall Environmental Analysis Laboratory received 20 sample(s) on 3/12/2021 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued March 30, 2021.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

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

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-1 @ 11.5
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 1:34:00 PM
Lab ID: 2103633-001 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	620	61		mg/Kg	20	3/23/2021 8:12:07 PM	58891
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	3/15/2021 5:34:32 PM	58689
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	3/15/2021 5:34:32 PM	58689
Surr: DNOP	83.1	70-130		%Rec	1	3/15/2021 5:34:32 PM	58689
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	3/15/2021 3:39:08 PM	58695
Surr: BFB	106	75.3-105	S	%Rec	1	3/15/2021 3:39:08 PM	58695

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-1 @ 13
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 1:39:00 PM
Lab ID: 2103633-002 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	410	61		mg/Kg	20	3/23/2021 8:24:32 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-3 @ 4
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 9:18:00 AM
Lab ID: 2103633-003 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	460	59		mg/Kg	20	3/23/2021 8:36:56 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-4 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 9:30:00 AM
Lab ID: 2103633-004 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	150	60		mg/Kg	20	3/23/2021 8:49:21 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-5 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 9:44:00 AM
Lab ID: 2103633-005 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	27000	1500		mg/Kg	500	3/25/2021 12:36:01 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-6 @ 10
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 2:19:00 PM
Lab ID: 2103633-006 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	1500	60		mg/Kg	20	3/23/2021 9:14:10 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-8 @ 8
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 2:30:00 PM
Lab ID: 2103633-007 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	2200	150		mg/Kg	50	3/25/2021 10:31:55 AM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-9 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 10:52:00 AM
Lab ID: 2103633-008 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	1800	60		mg/Kg	20	3/23/2021 9:38:59 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Project: WPX Campana 2M State 1
Lab ID: 2103633-009 **Matrix:** SOIL

Client Sample ID: TH-10 @ 0
Collection Date: 3/9/2021 11:10:00 AM
Received Date: 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	250	60		mg/Kg	20	3/23/2021 9:51:24 PM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-11 @ 10
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 2:59:00 PM
Lab ID: 2103633-010 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	7600	300		mg/Kg	100	3/25/2021 10:44:19 AM	58891

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-14 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 11:34:00 AM
Lab ID: 2103633-011 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	4200	150		mg/Kg	50	3/25/2021 10:56:44 AM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-15 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 12:00:00 PM
Lab ID: 2103633-012 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	16000	1500		mg/Kg	500	3/25/2021 11:09:09 AM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-16 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 12:20:00 PM
Lab ID: 2103633-013 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	410	60		mg/Kg	20	3/23/2021 2:24:42 PM	58901
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **mb**	
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	3/15/2021 5:53:54 PM	58689
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	3/15/2021 5:53:54 PM	58689
Surr: DNOP	78.4	70-130		%Rec	1	3/15/2021 5:53:54 PM	58689
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	3/15/2021 4:02:50 PM	58695
Surr: BFB	107	75.3-105	S	%Rec	1	3/15/2021 4:02:50 PM	58695

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-17 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/9/2021 12:40:00 PM
Lab ID: 2103633-014 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	9300	600		mg/Kg	200	3/25/2021 11:21:33 AM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-18 @ 0
Project: WPX Campana 2M State 1
Collection Date: 3/10/2021 10:14:00 AM
Lab ID: 2103633-015 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	1100	59		mg/Kg	20	3/23/2021 2:49:32 PM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-20 @ 2
Project: WPX Campana 2M State 1
Collection Date: 3/10/2021 10:55:00 AM
Lab ID: 2103633-016 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	530	60		mg/Kg	20	3/23/2021 3:26:45 PM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-21 @ 4
Project: WPX Campana 2M State 1
Collection Date: 3/10/2021 11:25:00 AM
Lab ID: 2103633-017 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	2300	60		mg/Kg	20	3/23/2021 3:39:09 PM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-22 @ 4
Project: WPX Campana 2M State 1
Collection Date: 3/10/2021 11:50:00 AM
Lab ID: 2103633-018 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	4500	150		mg/Kg	50	3/25/2021 11:33:58 AM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Client Sample ID: TH-23 @ 2
Project: WPX Campana 2M State 1
Collection Date: 3/10/2021 11:55:00 AM
Lab ID: 2103633-019 **Matrix:** SOIL **Received Date:** 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	130	61		mg/Kg	20	3/23/2021 4:03:58 PM	58901

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

Qualifiers:

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

Analytical Report
Lab Order **2103633**
Date Reported: **4/8/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller and Associates
Project: WPX Campana 2M State 1
Lab ID: 2103633-020 **Matrix:** SOIL

Client Sample ID: BG-1 @ 2
Collection Date: 3/10/2021 12:15:00 PM
Received Date: 3/12/2021 8:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **VP**	
Chloride	250	60		mg/Kg	20	3/23/2021 4:16:23 PM	58901

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

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103633**
08-Apr-21

Client: Souder, Miller and Associates
Project: WPX Campana 2M State 1

Sample ID: **MB-58901** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **58901** RunNo: **76140**
Prep Date: **3/23/2021** Analysis Date: **3/23/2021** SeqNo: **2696564** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-58901** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **58901** RunNo: **76140**
Prep Date: **3/23/2021** Analysis Date: **3/23/2021** SeqNo: **2696565** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.9	90	110			

Sample ID: **MB-58891** SampType: **MBLK** TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS** Batch ID: **58891** RunNo: **76140**
Prep Date: **3/23/2021** Analysis Date: **3/23/2021** SeqNo: **2696595** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-58891** SampType: **LCS** TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS** Batch ID: **58891** RunNo: **76140**
Prep Date: **3/23/2021** Analysis Date: **3/23/2021** SeqNo: **2696596** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.7	90	110			

Qualifiers:

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2103633**
08-Apr-21

Client: Souder, Miller and Associates
Project: WPX Campana 2M State 1

Sample ID: **MB-58689**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **58689**	RunNo: **75928**
Prep Date: **3/12/2021**	Analysis Date: **3/13/2021**	SeqNo: **2686862** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		90.9	70	130			

Sample ID: **LCS-58689**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **58689**	RunNo: **75928**
Prep Date: **3/12/2021**	Analysis Date: **3/13/2021**	SeqNo: **2686863** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	42	10	50.00	0	84.5	68.9	141			
Surr: DNOP	4.2		5.000		84.3	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2103633**

08-Apr-21

Client: Souder, Miller and Associates

Project: WPX Campana 2M State 1

Sample ID: **mb-58695**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **58695**	RunNo: **75941**
Prep Date: **3/12/2021**	Analysis Date: **3/15/2021**	SeqNo: **2687620** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		102	75.3	105			

Sample ID: **lcs-58695**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **58695**	RunNo: **75941**
Prep Date: **3/12/2021**	Analysis Date: **3/15/2021**	SeqNo: **2687621** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	105	80	120			
Surr: BFB	1200		1000		115	75.3	105			S

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: **Souder, Miller and Associates** Work Order Number: **2103633** RcptNo: 1

Received By: **Sean Livingston** **3/12/2021 8:35:00 AM** Sean Livingston

Completed By: **Sean Livingston** **3/12/2021 9:19:03 AM** Sean Livingston

Reviewed By: ENM 3/12/21

Chain of Custody

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

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preserved added to bottles? Yes ☐ No ☑ NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
10. Were any sample containers received broken? Yes ☐ No ☑

IC

# of preserved bottles checked for pH: 3/12/21 (<2 or >12 unless noted)

Adjusted?

Checked by:

11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

Special Handling (if applicable)

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

Person Notified: Date:

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

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client: Souder, Miller & Associates

Mailing Address: 401 W. Broadway
Farmington, NM 87401

Phone #: (505) 716-2787

email or Fax#: Heather.Woods@soudermiller.com

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

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:
WPX Campana 2M State #1

Project #:

Project Manager:
Heather Woods

Sampler: Heather Woods
On Ice: ☑ Yes ☐ No
# of Coolers: 1
Cooler Temp(including CF): 1.4 ±0 = 1.4 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2103633	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
3/9/21	1334	Soil	TH-1@11.5	(1)4OZ Glass	Non	001		X					X			
3/9/21	1339	Soil	TH-1@13	(1)4 oz Glass		002							X			
3/9/21	0918	Soil	TH-3@4	(1)4 oz Glass		003							X			
3/9/21	0930	Soil	TH-4@0	(1)4 oz Glass		004							X			
3/9/21	0944	Soil	TH-5@0	(1)4 oz Glass		005							X			
3/9/21	1419	Soil	TH-6@10	(1)4oz Glass		006							X			
3/9/21	1430	Soil	TH-8@8	(1)4oz Glass		007							X			
3/9/21	1052	Soil	TH-9@0	(1)4oz Glass		008							X			
3/9/21	1110	Soil	TH-10@0	(1)4oz Glass		009							X			
3/9/21	1459	Soil	TH-11@10	(1)4oz Glass		010							X			
3/9/21	1134	Soil	TH-14@0	(1)4oz Glass		011							X			
3/9/21	1200	Soil	TH-15@0	(1)4oz Glass		012							X			

Analysis Request

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
3/11/21	1637	Heath M. Woods	Christine Walters		3/11/21	1637
3/11/21	1747	Christine Walters		courier	3/12/21	8:35

Remarks: Page 1 of 2

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

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Souder Miller & Associates

Mailing Address: 401 W. Broadway, Farmington, NM 87401

Phone #: (505) 716-2787

email or Fax#: Heather.Woods@soudermiller.com

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

Accreditation: ☐ Az Compliance ☐ NELAC ☐ Other ____

☐ EDD (Type) ____

Turn-Around Time: ☒ Standard ☐ Rush

Project Name: WPX Campana 2M State #1

Project #:

Project Manager: Heather Woods

Sampler: Heather Woods

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp (including CF): 1.4±0=1.4 (°C)

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No.	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)						
3/9/21	1220	Soil	TH-16@0	(1) 4oz Glass	Non	013		X					X									
3/9/21	1240	Soil	TH-17@0	|	|	014							X									
3/10/21	1014	Soil	TH-18@0	|	|	015							X									
3/10/21	1055	Soil	TH-20@2	|	|	016							X									
3/10/21	1125	Soil	TH-21@4	|	|	017							X									
3/10/21	1150	Soil	TH-22@4	|	|	018							X									
3/10/21	1155	Soil	TH-23@2	|	|	019							X									
3/10/21	1215	Soil	~~TH~~ BG-1@2	|	|	020																
			NFS HW																			

Date	Time	Relinquished by	Received by	Via	Date	Time
3/11/21	1637	Heather M. Woods	Christine Walters		3/11/21	1637
3/11/21	1747	Christine Walters	SGC	Courier	3/12/21	8:35

Remarks: Page 2 of 2

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

APPENDIX G

CONSTRUCTION QUALITY ASSURANCE PLAN

CONSTRUCTION QUALITY ASSURANCE/QUALITY CONTROL PLAN

CAMPANA 2M STATE #001 BURIAL TRENCH
EDDY COUNTY, NEW MEXICO

Prepared for

Devon Energy Production Company

Prepared by

Souder, Miller & Associates

Michael J. Pretti, P.E.
Principal

Date: June 2023
SMA Project No.: 5E29549-BG4

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1.0 INTRODUCTION

This Construction Quality Assurance Quality Control Plan (CQAQCP) addresses the quality assurance of the construction and installation of the burial trench liner and cover, including earthen materials and geomembrane, relating to for the Campana 2M State #001 burial trench project, Eddy County, New Mexico.

1.1 CONSTRUCTION QUALITY ASSURANCE

Construction quality assurance is defined as follows:

Construction Quality Assurance (CQA) is a planned system of activities that provides the Owner and permitting agency assurance that the facility was constructed as specified in the design. Construction quality assurance includes inspections, verifications, audits, and evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility. Construction quality assurance refers to measures taken by the CQA organization to assess if the Installer or Contractor is in compliance with the plans and specifications for a project.

1.2 GENERAL TESTING REQUIREMENTS

This CQAQCP includes references to test procedures of the American Society for Testing and Materials (ASTM), the National Sanitation Foundation Standard Number 54 Flexible Membrane Liners, and the Geosynthetics Research Institute (GRI).

Unless indicated otherwise, tests will be performed in strict accordance with the referenced test procedure and the description included in this plan. Any deviations to test procedures specified in this plan must be approved, in writing, by the Construction Quality Assurance Engineer (CQAE).

1.3 ORGANIZATION AND USE OF THE CQAQCP

The Construction Quality Assurance/Quality Control Plan is divided into three main sections as follows:

Section 1.0	Introduction
Section 2.0	Earthen Materials
Section 3.0	Geosynthetics

This organization is based on general construction procedures and materials and does not follow the actual sequence of systems as they are constructed within the landfill.

1.3.1 Definition and Responsibility of Parties

The successful completion of the burial trench liner and cover construction is dependent on the interaction of several qualified parties. These parties include those associated with the ownership; design and specification preparation; manufacture, fabrication, transportation, installation, and quality assurance of the geosynthetics; and the placement, testing, and quality assurance of construction of earthen materials.

Within each of the following party descriptions, reference is made to title and, where applicable, to the individuals within that party responsible for carrying out the provisions of this CQAQCP.

1.3.1.1 Construction Quality Assurance Engineer (CQAE)

The Owner will retain an independent consulting firm to fulfill the role of CQAE. The CQAE will provide overall coordination of documentation submitted in support of this plan. The CQAE will prepare the Construction Certification Report which will be submitted to the New Mexico Oil Conservation Department (NMOCD) and New Mexico State Land Office (NMSLO). The term "CQAE" or “Construction Engineer” is used throughout this document when reference is made to fulfillment of this role. The CQAE may assign other staff members to the job site during construction activities.

1.3.1.2 Design Engineer

The Design Engineer is the company hired by the Owner to prepare the Burial Trench Design, Operations, and Closure Plan. The term "Design Engineer" is used throughout this document to indicate the official representative of the Design Engineer, whether on site or not.

1.3.1.3 Facility Owner

The property is currently owned and operated by Devon Energy Production Company (Devon) making them the Owner of the facility. The term "Owner " is used throughout this document to indicate the official representative of the Owner.

1.3.1.4 General Contractor

The General Contractor's role will be performed by the Owner or a Contractor that the Owner hires to furnish overall construction responsibility for the completion of the landfill construction. The General Contractor will also be responsible for hiring of all subcontractors such as the Geosynthetic Installer and the Earthwork Contractor. The term "Contractor" is used throughout this document when reference is made to the tasks and responsibilities of the General Contractor.

1.3.1.5 Geosynthetic Installer

The Geosynthetic Installer is the General Contractor or a subcontractor hired to install the geosynthetic components referenced in this plan. The term "Installer" is used throughout this plan when reference is made to the tasks and responsibilities of the Geosynthetic Installer.

1.3.1.6 Geosynthetic Manufacturers

The Geosynthetic Manufacturers are those hired by the General Contractor to furnish the geosynthetic components referenced in this manual. The term "Geomembrane Manufacturer", is used throughout this plan to indicate the specific company supplying these materials to the job site. This plan includes specific quality assurance and quality control requirements for the geosynthetic manufacturers in their role of providing the quality control during geosynthetic manufacturing.

1.3.1.7 Resin Supplier

The Resin Supplier is the company or companies selected by the Geosynthetic Manufacturer(s) to furnish the resins used in fabricating the geosynthetic components. The term "Resin Supplier" is used in this manual to denote, individually, each respective supplier. Designations of the specific resin suppliers are not necessary since all communication and responsibilities within this plan are between the respective manufacturers and suppliers.

1.3.1.8 Soils Testing Laboratory

The Soils Testing Laboratory is the independent laboratory hired by the Owner to perform field and laboratory QA/QC soils tests as indicated in the plan. The term "Soils Testing Laboratory" is used

throughout this manual to denote the official representative of the company providing these services. The Soils Testing Laboratory or CQAE will supply technicians as necessary for collection and laboratory analyses of samples and testing of in-place earthen materials.

1.3.2 Organization of the CQAQCP Parties

Overall responsibility for carrying out the provisions of this CQAQCP is with the CQAE. The CQAE may consult the Design Engineer regarding design specifications and/or recommended changes; however, the Design Engineer has no direct responsibilities set forth in this plan.

The Contractor (including any subcontractors that may be brought to the site) will report to the Owner and the CQAE for matters relating to the CQAQCP. For financial or other issues, the Contractor will report directly to the Owner.

1.4 MEETINGS

There are two types of meetings which will be required for implementation of this Plan including pre-construction meetings and problem/deficiency meetings:

A pre-construction meeting will be conducted immediately prior to any construction and will be attended by the Owner and the Contractor along with other appropriate parties such as the Soils Testing Laboratory, and the CQAE. The purpose of this meeting will be to review the project and the CQAQCP as it applies to environmental control system construction and familiarize all parties with their respective responsibilities and interactions.

Problem/deficiency meetings will be conducted, as requested by the Owner or the CQAE, to work out problems which may arise with the construction or QA/QC testing. The meetings will be attended by appropriate parties.

1.5 DOCUMENTATION

This section describes the types of documentation reports that must be completed by each party that has direct QA/QC responsibility for the landfill construction. The CQAE is responsible for construction documentation and will ensure that other parties to the construction will document their portions of the work.

The documentation of construction quality assurance activities is the most effective method to ensure that the quality assurance requirements have been addressed and satisfied. The documentation process includes:

- Recognition of construction tasks that should be documented.
- Assignment of responsibilities for the observation, testing, and documentation of these tasks.
- Completion of the required forms, data sheets, and reports to provide an accurate record of the work performed during construction.

1.5.1 Daily Construction Reports

A construction report will be completed by the CQAE or the Soils Testing Laboratory each day that they perform work on the site. This summary report will provide a chronological record for identifying and recording other reports, data sheets, forms, and checklists. This report will contain, at a minimum, the following information to be filled out in ink and preferably pre-printed so that the required information is organized in an easily accessible manner:

- Date, project name, location, and report preparer's name. The number and name of people on site under the direction of the preparer related to QA/QC tasks.
- Data on weather conditions including temperature, humidity, wind direction and speed, cloud cover, and any precipitation events.
- Contractor's or Installer's work force, equipment in use and idle, and materials delivered to or removed from the job site.
- Chronological description of work in progress including any notices to, or requests from, the Contractor and/or the Installer.
- Results of, or a clear reference to, where the results can be found for testing performed on site by personnel under the direction of the preparer.
- Laboratory samples collected, marked, and sent to the outside testing laboratories will be clearly indicated in the daily report by direct inclusion or by reference to the document containing such information. Likewise, reference should be included for any test data submitted by any of the outside testing laboratories.
- An accurate record of communications with other CQAQCP parties, or any other outside companies, regulatory agencies, or consultants regarding the day's construction activities or any project meetings that are held will be maintained.
- An accurate record of calibrations or standardizations performed on field testing equipment, including actions taken as a result of recalibrations, will also be maintained.

1.5.2 Problem/Deficiency Identification and Corrective Action Reports

Problem and/or deficiency and corrective action reports will be completed by the Soils Testing Laboratory and/or the CQAE when any construction material or activity is observed or tested and does not meet the requirements set forth in this plan. These reports are not necessary for a failing field test if corrective action is taken and retesting confirms acceptable properties. These reports should be cross-referenced to the forms, data sheets, checklists, and other reports that contain data or observations leading to the determination of a problem or deficiency. At a minimum, the Problem/Deficiency Identification and Corrective Action Reports will include the following information:

- A detailed description of the problem or deficiency, including reference to any supplemental data or observations responsible for determining the problem or deficiency.
- Location of the problem or deficiency, including how and when the problem or deficiency was discovered. In addition, an estimate of how long the problem or deficiency has existed should be included as well as an opinion as to the probable cause of the problem or deficiency.
- A recommended corrective action for resolving the problem or deficiency should also be included in the report. If the corrective action has already been implemented, then the observations and documentation to show that the problem or deficiency has been resolved should be included. If the problem or deficiency has not been resolved by the end of the day upon which it was discovered, then the report will clearly state that it is an unresolved problem or deficiency.

A problem/deficiency report will be submitted to the CQAE by the end of the working day during which the problem or deficiency occurred. The CQAE will then inform the Owner as soon as possible. If the problem or deficiency has not been resolved, then the CQAE and the report preparer will discuss the issue with the Owner, and the Owner will take the necessary corrective actions to resolve the problem or deficiency as soon as practical.

The CQAE will carefully review all problem/deficiency reports to determine if similar reports on the same problem or deficiency are an indication of a need to make changes to the plans and specifications and/or the CQAQCP. If this situation should develop, a meeting will be held to determine if revisions to the plans or specifications should be made. Any revisions to the plans, specifications or the CQAQCP must be approved by the Owner and the appropriate parties. The CQAE will also review deficiency reports and actions taken related to contractor field operations. NMOCD and SLO will be notified in a timely manner of changes to the design documents. NMOCD and NMSLO approval is required for major changes to plans, specifications and the CQAQCP.

1.5.3 Final Construction Documentation Report

A Final Construction Documentation Report will be prepared by the CQAE following completed construction. At a minimum, the Final Construction Documentation Report will contain the following information:

- Certification by a professional engineer, registered in the State of New Mexico, that, based on his/her knowledge, the construction has been performed in substantial conformance with this Plan.
- Narrative describing the construction events in chronological order and results of any quality assurance testing.
- Field and laboratory test data relevant to cover soil.
- Field and laboratory test data relevant to geosynthetic liner.
- Field and laboratory data relevant to revegetation.
- Daily field reports prepared by the onsite CQA field technician.
- Photographs documenting construction.
- As-built drawings.
- The entire CQAQCP in effect at that time.
- A summary of all problem/deficiency reports and resolutions. Include all items considered by the CQAE to be non-conforming to the approved CQAQCP and what each resolution required and how it was employed in the field.
- A discussion of changes made to the approved design.
- All Installer's Daily Reports on panel deployment, seaming repairs and associated testing and calibration data for geomembranes and geotextiles.
- Geomembrane liner as-built layout plan prepared by the Installer.
- All shippers' listing of panel or roll numbers, thickness, and dimensions for geomembranes and geotextiles.
- Any installation acceptance forms completed by Owner and Installers.

Final construction documentation reports shall be submitted to NMOCD, NMSLO, and the Owner.

2.0 EARTHEN MATERIALS

2.1 EARTHEN MATERIAL PLACEMENT REQUIREMENTS

2.1.1 Impacted Soils

The Campana 2M State #001 site is an inactive production facility located approximately 7 miles south-southwest of Carlsbad, New Mexico on State Trust land. Brine impacted soils related to the former reserve trench located at the site will be excavated, placed on a temporarily lined pad, then replaced back into the excavation following liner installation.

2.1.2 Final Cover Soil

The final cover soil layer shall consist of over-excavated soils meeting the reclamation requirements and will be placed in the top four feet of the excavation, then recontoured to blend with surrounding topography.

2.1.3 Placement Criteria

The following placement criteria will be used by the Contractor while placement of impacted soils over the geomembrane liner and installing the final cover soil layer:

- Any soils that are within 2 feet of the geomembrane liner and cover (either underlying or overlying) shall not contain material that is potentially damaging to the geomembrane liner or cover. The surface shall be smooth, firm, and unyielding, and free of:
  - Vegetation.
  - Construction Debris.
  - Sticks.
  - Sharp rocks and rocks larger than 2 inches.
  - Void spaces.
  - Ice.
  - Abrupt elevation changes.
  - Standing water.
  - Cracks larger than one-quarter inch (6 mm) in width.
  - Any other foreign matter that could contact the geomembrane.
- A minimum of 1-foot of soil shall be maintained between equipment with a ground pressure of less than 5 psi, 2 feet for all other tracked vehicles, and 3 feet for all other wheeled vehicles. All heavily traveled areas shall have a minimum of 3 feet of material above the liner and cover geomembrane. Sand ramps shall be provided on slopes and in other heavily traveled areas. Only large radius turns by any equipment shall be permitted as sharp turns may damage the liner.
- During the placement of the soil over the geomembrane, no construction equipment shall be allowed directly on the geomembrane and any damage to the underlying liner or cover geomembrane caused during soil placement shall be repaired immediately by the Contractor at no expense to the Owner.
- Soils shall not be placed over a fold in the geomembrane. Placement of soils shall be such that material placement will “walk out” wrinkles, not fold them over.
- Soil shall only be pushed upslope from the excavation base.
- Soils can only be spread when the geomembrane is taut or stretched evenly over its base. The soils shall not be spread when the geomembrane is elongated due to higher daytime

temperatures and exposure to sun. The Contractor must make provisions to cover the geomembrane under non-elongated conditions.

2.1.4 Deficiencies and Resolutions

If a deficiency in earthwork is discovered during construction, the extent and nature of the defect will be immediately determined by additional testing, observation, review of data, or other appropriate means. The Contractor will perform the necessary corrective tasks. The area will be retested or re-observed, as appropriate, to document that the defect has been satisfactorily corrected. Additional work shall not be performed in the area of deficiency until the deficiency is corrected.

2.1.5 Documentation Report

Upon completion of the placement, the documentation information will be gathered, organized, summarized, and presented for inclusion in the Final Construction Documentation Report described in Section 1.5.3. The report will include:

- Soil testing results.
- Daily reports.
- Short narrative summary which describes the construction process of this component.

3.0 GEOSYNTHETICS

This section of the CQAQCP applies to geosynthetics used in the construction of the burial trench liner and cover.

3.1 SCRIM-REINFORCED LINEAR LOW-DENSITY POLYETHYLENE

The scrim-reinforced linear low-density polyethylene (RPE) used on this project shall be 30-mil or equal.

3.1.1 RPE Manufacturing

- Prior to delivery of any RPE geomembrane panels to the site, the Manufacturer will provide the CQAE with the following information: The resin supplier, supplier location, and brand name
- Any test results conducted by the geomembrane and/or resin manufacturer to document the quality of the resin used in the membrane fabrication
- The QC plan that the geomembrane manufacturer will be using for the geomembrane being supplied.

Every panel of RPE geomembrane delivered to the site must be manufactured and inspected by the Manufacturer according to the following requirements:

- The materials used for the geomembrane must consist of first-quality 100% virgin products designed and manufactured specifically for the purpose of this work, which must have been satisfactorily demonstrated to be suitable and durable for such purposes.
- The geomembrane must be free from holes, pin holes, bubbles, blisters, excessive gels, undispersed resins, and/or carbon black, or contamination by foreign matter.
- All factory seams must have a minimum seam width of 1.5 inch scrim to scrim.

The RPE Geomembrane Manufacturer will perform the tests listed in Table 1 at the frequency of one test per every 100,000 square feet of material and will report the results to the CQAE. The RPE Geomembrane Manufacturer will provide certification based on tests performed by the Manufacturer's laboratory, or other outside laboratory contracted by the Manufacturer, that the membrane supplied under this plan will substantially comply with specifications listed in Table 1.

3.1.2 Delivery, Handling, and Storage of RPE Geomembrane Rolls/Panels

Transportation of the RPE geomembrane panels to the job site is the responsibility of the Geomembrane Manufacturer. All on site handling is the responsibility of the Installer. The geomembrane will be protected during shipment from excessive heat or cold, puncture, cutting, or other damaging or deleterious conditions. Upon arrival, the Installer shall inspect all materials for defects in the manufacturing process and for damage during transportation. Materials judged by the CQAE to be severely damaged shall be rejected and removed from the site. Minor damage and defects shall be repaired by the Installer.

- The Installer will be responsible for making certain that the Manufacturer, geomembrane type, and thickness of each panel in a shipment are correct. The CQAE will also maintain a log of geomembrane panel deliveries throughout the construction process. This log shall include, at a minimum, the following:
  - Manufacture date
  - Date of receipt at the site

- Panel and lot batch numbers.

- The CQAE will be responsible throughout the pre-construction, construction, and post construction periods for observing and documenting the handling and storage of the RPE geomembrane to ensure that the integrity of the material is preserved. The CQAE will ensure the following:
  - Fabricated panels (accordion-folded in one direction, rolled in the other direction) will be unloaded from trucks in such a way that no damage occurs to the geomembrane.
  - Fabricated panels accordion folded in both directions will not be used.
  - Fabricated panels on pallets will be moved by forklifts.
- Folds of fabricated panels shall be examined for damage, particularly at kinks in the folds.
- All material will be stored on smooth clean dry level surfaces such that it will not be damaged, become dirty, or get wet internally.
- Depending on the timeline of the project, material shall be stored in a safe central location then staged at appropriate intermediate locations for deployment.
- Fabricated panels will ultimately be placed in the correct location and in the correct orientation for deployment as shown on the protective packaging or in contained deployment instructions.

3.1.3 Foundation

The Earthwork Contractor will be responsible for preparing the subgrade.

After the underlying surface has been accepted by the Installer and CQAE, it will be the Installer's responsibility to report to the CQAE any change in that surface that may require repair work. The supporting surface will be examined by the Installer and the CQAE to evaluate the surface conditions immediately prior to placement of the RPE geomembrane. The CQAE and Installer shall document in the daily report that the subgrade surface condition is compatible with the geosynthetics to be installed. All observations by the CQAE and Installer shall be documented.

There shall be no standing water on the subgrade when the liner is placed.

3.1.4 Placement Criteria

A panel layout and deployment instructions will be prepared by the Installer and provided to the CQAE at least ten calendar days prior to installation of the RPE geomembrane. Panels shall by unrolled and unfolded as indicated in the instructions. Unfolding shall be done with a person every 15 to 30 feet, depending on the size/weight of the panel.

RPE geomembrane placement must not be conducted during strong or gusty winds or during precipitation events and lightning storms. The CQAE will perform/document the following:

- Evaluate and document weather conditions for geomembrane placement and inform the Owner and the Installer when weather conditions do not meet specifications, so a determination of installation can be made.
- Monitor and document geomembrane placement as well as conditions of panels as placed:
  - Noting panel defects, tears, or other deformities
  - Measuring in-place panel dimensions
  - Recording panel numbers.

- Document that the equipment used does not damage the geomembrane by handling, heat, leakage of hydrocarbons, or by any other means.
- Document that the prepared soil surface for the geomembrane has not deteriorated since previous acceptance.
- Document that personnel working on geomembranes do not smoke, wear damaging clothing, or engage in activities that would damage the geomembrane.
- Document that adequate means are used to prevent uplift by wind while preventing damage to the geomembrane or supporting earthen foundation.
- Document that the direct contact with the geomembrane will be minimized. The geomembrane will be protected by geotextiles or extra geomembrane materials in areas where excessive traffic is anticipated.
- Document that the heavy construction equipment shall not be allowed to move directly on any deployed geomembrane. This includes rubber-tired vehicles such as automobiles and pickup trucks but does not include lightweight equipment like all-terrain vehicles.
- Document that the construction machinery must not perform sudden starts, stops, or sharp turns over the geomembrane.
- Document that the cover material, if applicable, must be placed from the bottom of slopes to the top.
- Document that the cover material must be placed in such a manner as not to induce wrinkles in the underlying geomembrane.
- Document all equipment that the contractor proposes to use within the geomembrane footprint is approved by the CQAE.

3.1.5 Geomembrane Seaming

As much as possible, all welding shall be completed by the Geosynthetic Manufacturer prior to delivery of the geomembrane on site.

Welding should be done as uniformly and consistently as possible. The objective is to melt the two surfaces and to allow them to cool and solidify as one integral body. When the weld is sectioned, there should not be a well-defined interface, nor should there be any particulates or voids along the weld line. There should be no crimps due to overheating. The adjacent geomembrane should not be overheated and oxidized such that it becomes brittle. The cross sections of welds shall be examined for symmetry, lack of crimping (overheating), and the presence of voids and foreign particulates. If voids and particulates are present, the weld will be rejected.

The Geosynthetic Manufacturer is responsible for completing their own fabrication seam QA/QC during manufacturing. The contractor shall submit the Geosynthetic Manufacturer's QA/QC procedures to the CQAE. The contractor must submit the Geosynthetic Manufacturers QA/QC seam test results, certifications, and test reports for all welds completed by the Geosynthetic Manufacturers to the CQAE.

If field seaming is necessary, all personnel performing seaming operations must be qualified by experience and by successfully passing seaming tests for the type of seaming equipment to be used. All seamers must have seaming experience of a minimum of 500,000 ft^2 of RPE geomembrane using the same type of equipment to be used on this project. The most experience on-site seamer, the "master seamer" (a seamer who has successfully seamed a minimum of 2,000,000 ft^2 of RPE geomembrane using the same type of equipment to be used on this project) will have direct supervisory responsibility at the site over

less experienced seamers. The Installer shall provide documentation of the qualifications of the seaming crew to the CQAE.

3.1.6 Defects and Repairs

This section applies to all defects including damage during placement and repairs from examinations, tests, or visual observations performed on the RPE geomembrane material and on field seams.

All areas of the RPE geomembrane will be visually observed and documented by the CQAE for identification of defects, holes, blisters, undispersed raw materials, large wrinkles, and any signs of contamination by foreign matter. The surface of the geomembrane will be clean at the time of visual observation. Each location that fails visual observation will be marked by the CQAE and repaired by the Installer. Work will not proceed in any area where defects are identified until suitable repairs are made.

Several procedures exist for the repair of flawed areas. The final decision as to the appropriate repair procedure will be agreed upon between the Installer and the CQAE prior to commencement of the repair. The following procedures are available:

- All non-penetrating linear flaws less than 0.125 inches wide may be repaired with no more than one extrusion bead of the same base polymer as the geomembrane.
- Penetrating holes less than 0.125 inches in diameter that do not expose scrim yarns may also be repaired with no more than one bead application.
- Holes that expose scrim yarns and those that are more than 0.125 inches in diameter shall be patched with the same geomembrane with patch yards oriented in the same direction as in the geomembrane. The patch shall extend at least three inches from the edge of the nearest damage if the damaged area is less than one inch in diameter. When damage exceeds one inch in diameter, the patch shall extend at least six inches from the nearest damage.

Under no circumstances will parallel and overlapping beads be used to fill in a flawed area or a gap. All patch extrusion welds shall be vacuum box tested and hot air patches can be either air lanced or vacuum tested, and the results recorded.

Each repair will be examined, numbered, and logged by the CQAE following these procedures:

- Performing systematic visual observation of the entire surface of the RPE geomembrane to locate and document defects and indicate for each defect the type of repair that is required
- Monitoring and recording the repair of defects and the non-destructive testing of all repairs
- Recording the location and the nature of all defect repairs.

3.1.7 Field Reporting and Documentation

Documenting and reporting methods will be implemented to allow the systematic recording of results of on-site monitoring and testing. Reporting forms will be used for panel placement. Unique identifying numbers will be assigned to each panel and used to reference panel location.

An Installer's certificate of subgrade acceptance will be obtained prior to panel placement. Panel location diagrams will be kept showing locations of all panels. These diagrams will be updated daily.

Table 1: Material Properties - 30 mil RPE Geomembrane

Property	*Test Method*	*Minimum Roll Averages*	*Typical Roll Averages*
Thickness	ASTM D5199	27 mil	30 mil
Weight	ASTM D751	126 lbf/msf	144 lbf/msf
Construction			
Tongue Tear Strength	ASTM D 5884	70 lbf	115 lbf
Grab Tensile at Break	ASTM D 7004	220 lbf	280 lbf
Tensile Elongation at Break	ASTM D 7004	22 %	30 %
Puncture Resistance	ASTM D 4833	80 lbf	100 lbf
Standard OIT or High Pressure HPOIT	ASTM D 3895 ASTM D 5885	100 min 400 min	150 min 2400 min
Hydraulic Conductivity		2.20×10^{-10} cm/sec	
Manufacturer and Field Seam Testing			
Peel Strength (ppi)[1]	ASTM D 7747	20	Per 750 feet of lineal seam
Shear Strength (ppi)[1]	ASTM D 7747	60	

APPENDIX H

SLO SEED MIX,
SLO EMAIL CORREPONDENCES

1 REVEGETATION PLANS

The following Revegetation Plans were developed for revegetation of sites in southeastern New Mexico. To determine which revegetation plan is appropriate follow procedures in the section titled Determining the Revegetation Plan.

Revegetation Plans contain seed mixtures, as well as seed bed preparation and planting requirements. The detailed instructions for seedbed preparation and planting can be found in the section Revegetation Techniques.

Table 3 - Revegetation Plans, Codes, and Soil Types for Southeastern New Mexico

REVEGTATION PLANS	CODE	SOIL TEXTURES
Clay	C	Clay, Silty Clay, Stony Silty Clay, Clay Loam, Silty Clay Loam (including saline and sodic Clay soils)
Loam	L	Silty Loam, Cobbly Silt Loam, Stony Silt Loam, Silt, Loam, Sandy, Clay Loam
Sandy Loam	SL	Very Fine Sandy Loam, Fine Sandy Loam, Cobbly Fine Sandy Loam, Sandy Loam, Cobbly Sandy Loam, Gravelly Fine Sandy Loam, Very Gravelly Fine Sand Loam, Stony Fine Sandy Loam, Stony Sandy Loam
Shallow	SH	Rocky Loam, Cobbly Loam
Course	CS	Gravelly Loam, very Gravelly Loam, Gravelly Sandy Loam, Very Gravelly Sandy Loam, Stony Loam, Stony Sandy Loam
Sandy	S	Loamy Fine Sand, Loam Sand, Very Gravelly Loamy Fine Sand
Blow Sand	BS	Fine Sand, Sand, Coarse Sand
Mountain Meadow	MM	Clay, Loam
Mountain Upland	MU	Clay Loam, Loam

NMSLO Seed Mix Clay (C)

CLAY (C) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Vine mesquite	**VNS, Southern**	**2.5**	**S**
Alkali sacaton	**VNS, Southern**	**2.0**	**S**
Tobosa grass	**VNS**	**2.0**	**F**
Blue grama	**Hachita, Lovington**	**1.0**	**D**
Forbs:			
Prairie coneflower	**VNS, Southern**	**1.0**	**D**
Blue flax	**Appar**	**1.0**	**D**
Scarlet globemallow	**VNS, Southern**	**1.0**	**D**
Shrubs:			
Fourwing saltbush	**VNS, Southern**	**2.0**	**D**
Douglas rabbitbrush	**VNS, Southern**	**1.5**	**F**
	Total PLS/acre	**14.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS, Southern – No Variety Stated, seed should be from a southern latitude collection of this species.

- Double above seed rates for broadcast or hydroseeding.
- If vine mesquite is not available, substitute Alamo switchgrass or galleta.
- If a species is not available, provide a suggested substitute to the New Mexico Land Office for approval. Increasing all other species proportionately may be acceptable.

SLO-recommended seed mix

NMSLO Seed Mix

Loamy (L)

LOAMY (L) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Black grama	VNS, Southern	1.0	D
Blue grama	Lovington	1.0	D
Sideoats grama	Vaughn, El Reno	4.0	F
Sand dropseed	VNS, Southern	2.0	S
Alkali sacaton	VNS, Southern	1.0	
Little bluestem	Cimarron, Pastura	1.5	F
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	18.0	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Sandy Loam (SL)

SANDY LOAM (SL) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Galleta grass	Viva, VNS, So.	2.5	F
Little bluestem	Cimmaron, Pastura	2.5	F
Blue grama	Hachita, Lovington	2.0	D
Sideoats grama	Vaughn, El Reno	2.0	F
Sand dropseed	VNS, Southern	1.0	S
Forbs:			
Indian blanketflower	VNS, Southern	1.0	D
Parry penstemon	VNS, Southern	1.0	D
Blue flax	Appar	1.0	D
Desert globemallow	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	VNS, Southern	2.0	D
Common winterfat	VNS, Southern	1.0	F
Apache plume	VNS, Southern	0.75	F
	Total PLS/acre	**17.75**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box

- VNS, Southern – No Variety Stated, seed should be from a southern latitude collection of this species.
- Double above seed rates for broadcast or hydroseeding.
- If Parry penstemon is not available, substitute firecracker penstemon.
- If desert globemallow is not available, substitute scarlet globemallow or Nelson globemallow.
- If a species is not available, provide a suggested substitute to the New Mexico Land Office for approval. Increasing all other species proportionately may be acceptable.

NMSLO Seed Mix Lime – Gypsum (LG)

LIME – GYPSUM (LG) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Black grama	**VNS, Southern**	**1.0**	**D**
Blue grama	**Lovington**	**1.0**	**D**
Sideoats grama	**Vaughn, El Reno**	**4.0**	**F**
Plains bristlegrass	**VNS, Southern**	**2.0**	**D**
Sand dropseed	**VNS, Southern**	**2.0**	**S**
Forbs:			
Firewheel (*Gaillardia*)	**VNS, Southern**	**1.0**	**D**
Annual Sunflower	**VNS, Southern**	**1.0**	**D**
Shrubs:			
Fourwing saltbush	**VNS, Southern**	**1.0**	**F**
	Total PLS/acre	**13.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Sandy with Tall Grass (ST)

SANDY with TALL GRASS (ST) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sand bluestem	**Elida, VNS, So.**	**2.0**	**F**
Sideoats grama	**Vaughn, El Reno**	**4.0**	**F**
Little bluestem	**Pastura, Cimmaron**	**6.0**	**F**
Plains bristlegrass	**VNS, Southern**	**1.0**	**D**
Sand dropseed	**VNS, Southern**	**2.0**	**S**
Forbs:			
Indian blanketflower	**VNS, Southern**	**1.0**	**D**
Plains coreopsis	**VNS, Southern**	**1.0**	**S**
	Total PLS/acre	**17.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Shallow (SH)

SHALLOW (SH) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sideoats grama	**Vaughn, El Reno**	**4.0**	**F**
Blue grama	**Lovington, Hachita**	**3.0**	**D**
Little bluestem	**Pastura, Cimmaron**	**1.5**	**F**
Green sprangletop	**VNS, Southern**	**1.0**	**D**
Plains bristlegrass	**VNS, Southern**	**1.0**	**D**
Forbs:			
Firewheel (*Gaillardia*)	**VNS, Southern**	**1.0**	**D**
Shrubs:			
Fourwing saltbush	**Marana, Santa Rita**	**1.0**	**D**
Common winterfat	**VNS, Southern**	**0.5**	**F**
	Total PLS/acre	**13.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Coarse (CS)

COARSE (CS) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sand bluestem	VNS, Southern	2.0	F
Sideoats grama	Vaughn, El Reno	2.0	F
Blue grama	Hachita, Lovington	1.5	D
Little bluestem	Cimmaron, Pastura	1.5	F
Sand dropseed	VNS, Southern	1.0	S
Plains bristlegrass	VNS, Southern	0.75	D
Forbs:			
Parry penstemon	VNS, Southern	1.0	D
Desert globemallow	VNS, Southern	1.0	D
White prairieclover	Kaneb, VNS	0.5	D
Sulfur buckwheat	VNS, Southern	0.5	D
Shrubs:			
Fourwing saltbush	VNS, Southern	1.0	D
Skunkbush sumac	VNS, Southern	1.0	D
Common winterfat	VNS, Southern	1.0	F
Fringed sagewort	VNS, Southern	0.5	F
	Total PLS/acre	**18.25**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box

- VNS, Southern – No Variety Stated, seed should be from a southern latitude collection of this species.
- Double above seed rates for broadcast or hydroseeding.
- If Parry is not available, substitute firecracker penstemon.
- If desert globemallow is not available, substitute scarlet globemallow.
- If one species is not available, provide a suggested substitute to the New Mexico Land Office for approval. Increasing all other species proportionately may be acceptable.

NMSLO Seed Mix Sandy (S)

SANDY (S) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sand bluestem	Elida, VNS, So.	2.0	F
Little bluestem	Cimarron, Pastura	3.0	F
Black grama	VNS, Southern	1.0	D
Sand dropseed	VNS, Southern	4.0	S
Plains bristlegrass	VNS, Southern	2.0	D
Forbs:			
Firewheel (Gaillardia)	VNS, Southern	1.0	D
Annual Sunflower	VNS, Southern	1.0	D
Shrubs:			
Fourwing Saltbush	VNS, Southern	1.0	F
	Total PLS/acre	16.0	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Deep Sand (DS)

1.1 BLOW SAND SITES REVEGETATION PLAN (BS)

Use this Revegetation Plan with the following ESD's:
CP2 – Sandy Plains, Sandhills, Deep Sand, Shallow Plains
HP3 – Loamy Sand, Sandy Plains, Sandhills, Deep Sand
SD3 – Loamy Sand, Deep Sand, Sandhills, Salt Meadow

Soil Texture: Fine Sand, Sand, Course Sand

Revegetation Procedures:

I. **For flat or gently sloping areas with slopes less than or equal to 3H:1V:**
1. **Soil Amendments:** Apply composted manure or similar at the rate of 30.0 air dry tons/acre.
2. **Fertilize:** Type 2
3. **Mulch** – Grass Hay mulch applied at 2.0 tons/acre
4. **Prepare the seedbed and incorporate mulch, fertilizer, and soil amendments**:
    a. Scarify
    b. Disc (thoroughly mix mulch, fertilizer, and soil amendments in top 6-8 inches of soil before proceeding).
5. **Drill Seed** – use rangeland drill and apply Drill box seed to 0.5-0.75 inch depth, apply small seed to surface and lightly cover with drag chains or packer wheels or equal.
6. **Mulch** – Grass Hay mulch applied at 2.0 tons/acre
7. **Crimp**
8. **Tackify** – tackify to minimize risk of mulch blowing and to hold soil and mulch in place until vegetation begins to establish.
9. **Wind Fence** – Install wind fence.

NMSLO Seed Mix Deep Sand (DS)

DEEP SAND (DS) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sand bluestem	**Elida, VNS, So.**	**4.0**	**F**
Sideoats grama	**Vaughn, El Reno**	**4.0**	**F**
Little bluestem	**Cimarron, Pastura**	**3.0**	**F**
Plains bristlegrass	**VNS, Southern**	**1.0**	**D**
Sand dropseed	**VNS, Southern**	**2.0**	**S**
Blue grama	**Lovington**	**1.0**	**D**
Forbs:			
Firewheel (Gaillardia)	**VNS, Southern**	**1.0**	**D**
Anuual Sunflower	**VNS, Southern**	**0.5**	**D**
Prairie Conflower	**VNS, Southern**	**0.5**	**D**
	Total PLS/acre	**17**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix Deep Sand (DS)

From: Knight, Tami C.
To: Stephanie Hinds
Subject: RE: [EXTERNAL]RE: WPX Campana #2 Workplan
Date: Monday, November 20, 2023 2:34:56 PM
Attachments: image001.png
image004.png
image005.png
image006.png

We have no other concern.

Tami

From: Stephanie Hinds <stephanie.hinds@soudermiller.com>
Sent: Monday, November 20, 2023 2:10 PM
To: Knight, Tami C. <tknight@slo.state.nm.us>
Subject: FW: [EXTERNAL]RE: WPX Campana #2 Workplan

Oops, sent to your old email address. Sorry! Please see below.

From: Stephanie Hinds
Sent: Monday, November 20, 2023 2:08 PM
To: Tami Knight <TKnight@envirotech-inc.com>
Subject: RE: [EXTERNAL]RE: WPX Campana #2 Workplan

Hi Tami,

I have a meeting with Devon this afternoon to go over the karst concern. I will volunteer to set up a meeting between Devon and OCD/SLO. Aside from OCD's comment on the karst, were there any additional concerns from SLO on the workplan? I noted that the plan will update the seed mix for loamy soils.

Thanks,

SMA Since 1985
Stronger Communities by Design
www.soudermiller.com

Stephanie Hinds, P.E.
Project Engineer

Direct/Mobile: 505.793.7079
Office: 505.302.1127

112 W. Montezuma Ave, Suite 3
Cortez, CO 81321

P.E. licensed in CO & NM

From: Stephanie Hinds
Sent: Wednesday, October 25, 2023 10:42 AM
To: Knight, Tami C. <tknight@slo.state.nm.us>
Cc: Sarahmay Schlea <sarahmay.schlea@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Subject: RE: [EXTERNAL]RE: WPX Campana #2 Workplan

Hi Tami,

Let me check with Devon. Last I spoke with them, they said they would try to coordinate a meeting with SLO and OCD to discuss.

Do you think we still need to reconsider the karst designation from high to low?

Thanks,

SMA Since 1985
Stronger Communities by Design
www.soudermiller.com

Stephanie Hinds, P.E.
Project Engineer

Direct/Mobile: 505.793.7079
Office: 505.302.1127

112 W. Montezuma Ave, Suite 3
Cortez, CO 81321

P.E. licensed in CO & NM

From: Knight, Tami C. <tknight@slo.state.nm.us>
Sent: Tuesday, October 24, 2023 8:38 AM
To: Stephanie Hinds <stephanie.hinds@soudermiller.com>
Cc: Sarahmay Schlea <sarahmay.schlea@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Subject: RE: [EXTERNAL]RE: WPX Campana #2 Workplan

Stephanie

What is the status of a new workplan for WPX?

Thanks

PLEASE SUBMIT WORKPLANS AND REPORTS TO ECO@SLO.STATE.NM.US

Tami Knight, CHMM
Environmental Specialist
SRD-Environmental
Compliance Office (ECO)
505.670.1638
New Mexico State Land Office
1300 W. Broadway Avenue, Suite A
Bloomfield, NM 87413
tknight@slo.state.nm.us
nmstatelands.org
……

From: Stephanie Hinds <stephanie.hinds@soudermiller.com>
Sent: Tuesday, September 26, 2023 3:50 PM
To: Knight, Tami C. <tknight@slo.state.nm.us>
Cc: Heltman, Elaine G. <eheltman@slo.state.nm.us>; Biernoff, Ari <abiernoff@slo.state.nm.us>; Sarahmay Schlea <sarahmay.schlea@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Subject: RE: [EXTERNAL]RE: WPX Campana #2 Workplan

Hi Tami,

The high karst area determination was pulled from BLM's GIS data:
https://www.nm.blm.gov/shapeFiles/cfo/carlsbad_spatial_data.html
Also, please see Sarahmay's note below. Thoughts?

Thanks,

Stephanie Hinds, P.E.
Project Engineer

Direct/Mobile: 505.793.7079
Office: 505.302.1127

112 W. Montezuma Ave, Suite 3
Cortez, CO 81321

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www.soudermiller.com

From: Sarahmay Schlea <sarahmay.schlea@soudermiller.com>
Sent: Tuesday, September 26, 2023 1:44 PM
To: Stephanie Hinds <stephanie.hinds@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Subject: Re: [EXTERNAL]RE: WPX Campana #2 Workplan

Hi Steph,

The updated BLM data still suggests that the Campana is within high potential. But when looking at a karst map of the contiguous US, it only suggests that it's in an evaporite basin without any underlying karst topography. That being said, I know the area that it is in pretty well, and there is a significant amount of underlying karst topography in that area, it might not be considered high karst based on USGS standards, but it's high enough that I would maintain the regulations. It's also only about 7 miles from Carlsbad Caverns NP, which is considered critical karst.

Sarahmay Schlea
Staff Scientist II

Direct/Office: (575) 449-2758
Mobile: (330) 958-5689

201 S Halagueno St
Carlsbad, NM 88220

Stronger Communities by Design

www.soudermiller.com

From: Stephanie Hinds <stephanie.hinds@soudermiller.com>
Sent: Tuesday, September 26, 2023 1:15 PM
To: Erin Berry <erin.berry@soudermiller.com>; Sarahmay Schlea <sarahmay.schlea@soudermiller.com>
Subject: FW: [EXTERNAL]RE: WPX Campana #2 Workplan

Hey, can one of you check the karst potential for the Campana location? Our initial maps show it in the high potential, but Tami/USGS maps seem to say otherwise.

From: Knight, Tami C. <tknight@slo.state.nm.us>
Sent: Tuesday, September 26, 2023 1:09 PM
To: Stephanie Hinds <stephanie.hinds@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Cc: Heltman, Elaine G. <eheltman@slo.state.nm.us>; Biernoff, Ari <abiernoff@slo.state.nm.us>
Subject: [EXTERNAL]RE: WPX Campana #2 Workplan

SMA Team

I just saw where OCD denied the plan due to high karst classification. USGS maps do not show this as a high karst area. Are there plans to complete this as a dig and haul or is there going to be a karst survey completed?

Thank you

Tami

From: Knight, Tami C.
Sent: Tuesday, September 26, 2023 12:31 PM
To: 'Stephanie Hinds' <stephanie.hinds@soudermiller.com>; Erin Berry <erin.berry@soudermiller.com>
Cc: Heltman, Elaine G. <eheltman@slo.state.nm.us>; Biernoff, Ari <abiernoff@slo.state.nm.us>
Subject: WPX Campana #2 Workplan

SMA Team

The revised workplan includes the same remediation process that was previously approved by ECO. However, I did notice the workplan still states reseeding with a BLM seed mix. I have attached the catalog of approved seed mixes for use in southeast New Mexico. They are based on soil types which SMA has identified the soil type as a loam, so the Loam mix would likely be most appropriate. ECO wants to

makes sure this condition of approval is noted for the subject workplan.

Thank you

Tami Knight, CHMM
Environmental Specialist
SRD-Environmental
Compliance Office (ECO)
505.670.1638
New Mexico State Land Office
1300 W. Broadway Avenue, Suite A
Bloomfield, NM 87413
tknight@slo.state.nm.us
nmstatelands.org

……

Venegas, Victoria, EMNRD

From: Venegas, Victoria, EMNRD
Sent: Tuesday, April 23, 2024 11:30 AM
To: jim.raley@dvn.com; Stephanie Hinds
Cc: Knight, Tami C.
Subject: 30-015-31725 CAMPANA 2M STATE #001 Application ID: 332430.
Attachments: C-144 30-015-31725 CAMPANA 2M STATE #001 04.23.2024.pdf

30-015-31725 CAMPANA 2M STATE #001 Application ID: 332430.

Good afternoon Mr. Raley.

NMOCD has reviewed the Closure Plan submitted by [246289] WPX Energy Permian, LLC/Devon on 04/11/2024, Application ID 332430, for a reserve pit associated with 30-015-31725 CAMPANA 2M STATE #001 [332515] in M-02-24S-26E, Eddy County, NM. This closure plan is approved with the following conditions of approval:

19.15.17.13 CLOSURE AND SITE RECLAMATION REQUIREMENTS:

- Within 60 days of closure completion, the operator shall submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; and details on back-filling, capping and covering, where applicable. In the closure report, the operator shall certify that all information in the report and attachments is correct, and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan. If the operator used a temporary pit, the operator shall provide a plat of the pit location on form C-l 05 within 60 days of closing the temporary pit.

- If the operator elects to conduct onsite burial under Subsection D of 19.15.17.13 NMAC, the operator shall report the exact location of the onsite burial on form C-105 filed with the division.

- The operator shall place a steel marker at the center of an onsite burial. The steel marker shall be not less than four inches in diameter and shall be cemented in a three-foot deep hole at a minimum. The steel marker shall extend at least four feet above mean ground level and at least three feet below ground level. The operator's name, lease name and well number and location, including unit letter, section, township and range, and that the marker designates an onsite burial location shall be welded, stamped or otherwise permanently engraved into the metal of the steel marker. A person shall not build permanent structures over an onsite burial without the appropriate division district office's written approval. A person shall not remove an onsite burial marker without the division's written permission.

Please let me know if you have any additional questions.
Regards,

Victoria Venegas ● Environmental Specialist
Environmental Bureau
EMNRD - Oil Conservation Division
506 W. Texas Ave. Artesia, NM 88210
(575) 909-0269 | Victoria.Venegas@emnrd.nm.gov
https://www.emnrd.nm.gov/ocd/


STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 332430

CONDITIONS

Operator:	OGRID:
WPX Energy Permian, LLC Devon Energy - Regulatory Oklahoma City, OK 73102	246289
	Action Number: 332430
	Action Type: [C-144] Temporary Pit Plan (C-144T)

CONDITIONS

Created By	Condition	Condition Date
vvenegas	NMOCD has reviewed the Closure Plan submitted by [246289] WPX Energy Permian, LLC/Devon on 04/11/2024, Application ID 332430, for a reserve pit associated with 30-015-31725 CAMPANA 2M STATE #001 in M-02-24S-26E, Eddy County, NM. This closure plan is approved with the following conditions of approval: Within 60 days of closure completion, the operator shall submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; and details on back-filling, capping and covering, where applicable. In the closure report, the operator shall certify that all information in the report and attachments is correct, and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan. If the operator used a temporary pit, the operator shall provide a plat of the pit location on form C-l 05 within 60 days of closing the temporary pit.	4/23/2024