NM1 - ___3_____

Vadose Zone Monitoring Well Installation Report:

December 19, 2017

From: Charles Fiedler [mailto:CFiedler@team-psc.com]
Sent: Tuesday, December 19, 2017 10:22 AM
To: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Cc: Andrew L. Wambsganss <Andy@Wambsganss.com>
Subject: Sundance Services Closure Milestone #1 and 4th Quarter Report
Importance: High

Good Morning Jim,

Sundance Services, Inc. has completed Milestone #1 of their Closure Plan with the installation of the six (6) Vadose Zone Monitoring Wells required by Items 5 & 7.a. of the Approval letter dated 07/31/2017.

Please follow the link to the Vadose Zone Monitoring Well Installation Report:
https://files.acrobat.com/a/preview/16cae11a-83d4-427a-aa2c-21e2cc622d3a

With respect to Item 2 of the Approval, Sundance proposes the following closure schedule for Milestone #2 (Item 7.b), the removal of all produced water tanks, associated berms, and sumps:

Initiate efforts:	February 1, 2018
Sumps identified:	March 1, 2018
Tanks removed:	June 1, 2018
Berms/Sumps excavated:	July 1, 2018
Confirmation Testing:	October 1, 2018
Closure Confirmation Report:	December 31, 2018

In addition to the Produced Water Facilities closure, efforts are underway to facilitate the dewatering of Ponds 5 and 6 with evaporators that will be installed in the first quarter of 2018. Relative to the landfill, construction plans are under development to define the final cover construction grades for the north, east and south slopes. Efforts have also begun to stabilize materials present in Ponds 2 and 3 with plans to initiate material relocation to the landfill area beginning in the first quarter of 2018.

With respect to Item 3, we are focused on this deadline and will provide more detail regarding timelines to accomplish this requirement as they become available.

With respect to Item 4, Sump Location Identification will be initiated after the first of the year in conjunction with Item 7.b.

With respect to Item 5 we have initiated the abandonment process for the numerous piezometers located on the facility. This effort started with the identification and survey location of the piezometers, and has proceeded with the development of a *Well Plugging Plan of Operations* which was presented to and approved by the NM Office of State Engineer. The following is a link to a copy of this plan for your file: https://files.acrobat.com/a/preview/ffa819c4-365f-4726-842b-de27652a304f. We will initiate the abandonment and plugging of these piezometers as outlined in this plan in the first quarter of 2018.

With respect to Item 6, we are prepared to initiate quarterly sampling of the monitoring wells that present a sufficient quantity of water to collect representative samples. This effort will be begin in the first quarter of 2018.

This summary represents our 4th Quarter of 2017 Progress Report. We propose to provide a quarterly progress report on the closure status of the Closure Requirements and the Milestones identified in Item 7 at the end of each quarter moving forward.

In the interim, please let us know if you have any questions with the information that has been provided.
Charles

Charles W. Fiedler, P.E., LEED AP
Associate/Senior Practice Leader

GORDON ENVIRONMENTAL | PSC
213 S. Camino del Pueblo
Bernalillo, NM 87004
505.867.6990 Office
505.867.6991 Fax
505.750.3164 Cell

Gordon Environmental has merged with PSC

Vadose Zone Monitoring Well Network Installation Report

Sundance Services LLC.
NMOCD Facility Permit No.: NM-01-0003
Lea County, New Mexico

Submitted To:

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

Prepared For:

Sundance Services E&P Waste Disposal Facility
P.O. Box 1737
Eunice, NM 88231

Prepared By:

Gordon Environmental/PSC
213 S. Camino del Pueblo
Bernalillo, NM 87004
505.867.6990

December, 2017

Gordon/PSC Project #: 1011617.00

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1.0 PROJECT SUMMARY

The Sundance Services, Inc. (SSI) Surface Waste Management Facility is an active Facility operating pursuant to its current Permit (NM-00-0003) issued by the New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division (NMOCD), most recently modified on 02/18/2002. A Closure/Post Closure Plan (C/PC Plan) for the facility was filed with NMOCD by Sundance on 09/29/16 and agency approval, with Conditions, was granted in correspondence dated 7/31/2017.

The purpose of the C/PC Plan is to comply with requirements of 19.15.36.8.C(9) and 19.15.36.18 NMAC. The C/PC Plan includes detailed commitments for facility closure and post closure actions which will result in protection of fresh water, public health, safety and the environment. The C/PC Plan included proposals for for post closure monitoring of the facility.

Due to the absence of shallow protectable fresh groundwater resources at the facility, the C/PC Plan included a request for exemption from groundwater monitoring requirements, and a proposal for Vadose Zone Monitoring of the interface of shallow unconsolidated sands and gravels of the Ogallala Formation and the underlying red beds of the Chinle Group. This submittal includes details of the Vadose Zone Monitoring Plan, as well as documentation of installation of the Vadose Zone Monitoring Well network.

2.0 FACILITY DESCRIPTION

The SSI Surface Waste Management Facility is an existing solid waste disposal facility that is located approximately 4 miles east-northeast of the Town of Eunice, New Mexico. Location of the facility is shown on the location map in **Figure 1**. The SSI site is comprised of a 320-acre ± tract of land located in the South ½ of Section 29, Township 21 South, Range 38 East, Lea County, New Mexico. Waste management areas at the site include a liquid oil field waste processing area (approximately 80 acres) and an oil field waste landfill (approximately 80 acres) and a closed landfarm.

3.0 VADOSE ZONE MONITORING PLAN

Hydrogeologic conditions at the facility are characterized by an absence of shallow, protectable fresh groundwater beneath the site. Shallow stratigraphic units in the vicinity include veneers (50 feet or less in thickness) of lacustrine marl, shale and siltstone of the Cretaceous Fort Terrett

Formation, caliche, sand, gravel, silt and clay of the Tertiary Ogallala Formation and Quaternary aeolian sand overlying vertically and laterally extensive Triassic Chinle Group bedrock units (redbeds) consisting predominantly of dense clayey shale with minor interbedded siltstones and sandstones (Barnes, 1976). Details of the Vadose Zone Monitoring Plan (VM Plan) are set forth in Attachment D of the SSI C/PC Plan (Gordon, 2016). The intent of the VZM Plan is to provide for the earliest possible detection of potential fluid releases from the closed landfills or ponds. This would be accomplished by monitoring the zone immediately above the interface of relatively impermeable Chinle Group bedrock units below and conductive unconsolidated sandy-gravelly deposits of the Ogallala Formation above in downgradient locations adjacent to the SSI Waste Management Facility where seeping fluids would be expected to migrate laterally downslope on the upper redbed surface. The VZM Plan included a terrain map of the upper surface of the Chinle redbed/bedrock surface at the site which was prepared using redbed/bedrock top elevations obtained from more than 100 monitoring wells, piezometers and excavation control points that have been compiled during the facility's 30+ year operational period (Gordon, 2016, Figure 3). The Chinle terrain map was used to determine the most likely locations where fugitive fluids would be expected to migrate from the facility. Four Vadose Zone Monitoring Wells (VZM Wells), as well as an existing VZM Well were proposed as shown in Figure 3 of the VZM Plan.

The NMOCD approved the Site Closure Plan in correspondence dated 7/31/2017. The agency approval correspondence included several Conditions of Approval, including Condition 5, which increased the originally proposed 5 VZM Wells to 7. The final approved locations of the 7 VZM Wells are shown on the proposed Site Closure map in **Figure 2** of this submittal.

3.1 Vadose Zone Monitoring Well Design, Drilling and Completion

The VZM Plan included proposed drilling and installation methods, and design, for the VZM wells. The VZM Plan called for wells to be drilled using hollow-stem auger drilling methods to advance 8-inch diameter boreholes to fully penetrate the unconsolidated shallow sediments and the uppermost portion of the Chinle Group bedrock units below. The VZM Plan called for the wells to be completed with screened sections spanning the interval of the conductive units above the bedrock into the upper portions of the bedrock, with annular seals to prevent vertical flow of surface stormwater into the wells, or of vertical annular flow between penetrated zones. Generalized VZM well design set forth in the VZM Plan is illustrated in the well design diagram shown in **Figure 3**.

3.2 Vadose Zone Monitoring Plan Schedule and Methods

The VZM Plan (Gordon, 2016, Attachment D, Appendix A) included provisions for monitoring schedule and methods, which included initial monitoring of the VZM wells for the presence of fluids, and annual inspections thereafter. The NMOCD 7/31/2017 Closure Plan Approval, Condition 6 specified that quarterly VZM Well monitoring should be performed. The VZM wells will be checked quarterly for presence of fluids and site monitoring data recorded on a field Vadose Zone Monitoring Form (Gordon, 2016, Attachment D, Appendix A). If fluids adequate to allow well purging and sampling are observed, the well will be purged and sampled. Field purge parameters, including Depth to Fluid, Total Well Depth, Specific Conductance, pH and temperature will be noted. Collected fluid samples will be analyzed for Major Anions and Cations, RCRA Metals, Organic Compounds, Total Dissolved Solids and Total Petroleum Hydrocarbons in accordance with Gordon, 2016, Attachment D, Table 2.

4.0 VADOSE ZONE MONITORING WELL INSTALLATION

4.1 NMOSE Monitoring Well Permitting

Prior to installing the VZM wells, permits were obtained from the New Mexico Office of the State Engineer (NMOSE). Applications for VZM Well Nos. VZ-1, VZ-2, VZ-3, VZ-4, VZ-5, VZ-6 and VZ-7 were files on NMOSE Form WR-07. Permits for the wells were issued on April 10, 2009 (VZ-1), and on October 2, 2017 (VZ 2-7). Copies of the permit documents are included in **Attachment A**.

4.2 Pre Drilling Underground Utility Site Clearance

Prior to entering the site to install the VZM well network, the NM-811 Public Regulation Commission Pipeline Safety Bureau contractor was notified in accordance with New Mexico's Excavation Law Chapter 62, Article 14 NMSA 1978. Notices were made on 10/19/2017 and on 11/9/2017. Each of the proposed drilling locations was surveyed and staked, and all entities operating underground infrastructure were notified and informed of the proposed drilling locations. There were no conflicts with existing utilities. Documentation of NM-811 notification and clearance is included in **Attachment B**.

4.3 Borehole Advancement and Media Sampling

Vadose Zone Monitoring Well VZ-1 was installed on April 12, 2009. VZM Wells 2-7 were installed pursuant to completion of the VZM Plan commitments; drilling of VZM Wells 2-7 was performed by Talon, LPE Drilling, Amarillo, Texas. Drilling commenced on November 14, 2017 and was completed on November 17, 2017. Talon used a Central Mine Equipment (CME-75) rotary drilling rig to advance nominal 8-inch hollow-stem augers (HSA) to total depth to complete each boring. During drilling, a 3-inch x 5-foot split spoon core barrel was run inside the augers on steel rods and slightly ahead of the lead auger to collect depth-referenced samples of penetrated materials for lithologic descriptions. Descriptions of lithology, water-bearing potential, core recovery percentages, and other attributes of the penetrated materials are indicated on the VZM Well Logs, which are included in **Attachment C**. A photographic inventory of core samples recovered from the VZM well borings is included in **Attachment D** (photos 1-49).

4.4 Vadose Zone Monitoring Well Installation

Borings for the VZM wells were generally advanced through unconsolidated Tertiary and Quaternary sediments and a few feet into indurated shale or dense fine sandstone in the Chinle Group below. Upon reaching total depth in each boring, the core barrel and rods were withdrawn from the auger string and a string of 2-inch Schedule 40 PVC flush joint threaded monitoring well casing was inserted into the augers and advanced to the bottom of the drilled boring.

After verifying that the casing string was landed at the intended total depth of the boring, the auger string was lifted approximately 6 inches and 20/40 graded silica sand was poured into the space between the auger and the well casing until the lowermost 6 inches of the well annulus between the drilled hole and the well casing was filled with the sand. During sand placement, a weighted fiberglass tape measure was inserted into the well between the augers and the well casing, lowered to the bottom of the well and used to sound the depth of the top of the sand to verify the filled depth of the annulus and to ensure that all of the sand was being placed properly and that no “bridging” of the sand had occurred. Care was taken to avoid having the sand fill above the bottom of the lead auger and flood the space between the auger and the well casing, which would result in a risk of having the well casing become “sand locked” inside the auger, prohibiting the auger string from being removed from the hole without pulling the casing string out of the hole as well.

Upon verifying that the sand pack had been properly placed in the lowermost 6 inches of the well, the auger string was raised again and more sand was placed in the well. This process was repeated until the well annulus between the drilled hole and the casing had been fully flooded with sand in the interval opposite the well screen from the total depth of the boring to a point approximately 2 feet above the top of the well screen. After installing the annular sand pack, similar methods were employed to install ¼-inch bentonite pellets into the well annulus from the top of the sand pack to a point approximately 2 feet above the sand pack. The bentonite pellets were then hydrated with potable water and allowed to expand to affect a seal above the sand in the well annulus.

The remaining augers were withdrawn from the well and the well was left overnight to complete expansion of the bentonite seal. The remaining annulus of each well was then flooded with a mixture of neat Portland cement grout and a 5% admix of powdered bentonite from the pellet seal to a point approximately two feet below grade. The grout was installed from the bottom of the annular space using a hose and a grout pump. Photographic documentation of the well construction materials and methods is included in **Attachment D**, photos 50-61.

4.5 Surface Completions

Each of the VZM wells was completed with a 4-ft by 4-ft by 6-inch concrete pad surrounding the well casing, with a locking steel protecting casing set over the PVC casing and into the concrete pad. Four 3.5-inch by 4-ft steel concrete-filled bollard pipes were set in concrete next to the well pads and arrayed in the 4 principal directions around each well. Wells and surface completions were built in accordance with the designs and materials depicted in Figure 3. Photographs of the well surface completions are included in **Attachment D**, photos 62-67.

5.0 WELL COMPLETIONS, PENETRATED MATERIALS, SATURATED ZONES

The locations of the VZM wells, depths of screens and tops of penetrated zones, as well as fluid levels in wells that penetrated saturated sediments are summarized in **Table 1**. Depths of completed VZ wells 1-7 range from 23 feet to 60 feet. Details of penetrated sediments, saturated intervals and well completions are discussed below.

Well VZ-1 was installed on 4/12/2017. The well was drilled to a depth of 28.5 feet below land surface, penetrating 1.5 feet into the Chinle and screened in the estimated interval 23.5 feet to

28.5 feet. The well penetrated approximately 2.5 feet pf saturation in unconsolidated sediments above the Chinle.

Well VZ-2 was installed on 11/17/17. The well was drilled to a depth of 35 feet, penetrated 6 feet into Chine redbed and was screened in the interval 25 to 35 feet below land surface. No fluids were detected in well VZ-2 during drilling or in post completion inspections.

Well VZ-3 was installed on 11/16/17. The well was drilled to a depth of 60 feet, penetrating 25 feet of olive grey fine silt and sandstone in the Chinle, with moist sediments observed in the uppermost, more friable portion of this section. The well was screened in the interval 50-60 feet below land surface. The boring contained no fluids upon reaching total depth; however approximately 12 feet of fluid was noted in the bottom of the completed well on 11/20/17.

Well VZ-4 was installed on 11/15/17. The well was advanced to a depth of 25 feet, penetrating 3 feet of dense, clayey Chinle shale. Saturated sediments were observed from a depth of 15 feet to the top of the shale. The well was screened in the interval 25-15 feet below land surface. Fluid level was approximately 15 feet below grade upon completion of the well and was observed to be approximately 4 feet below the top of the casing on 11/20/17. The well was purged and sampled on 11/20/17 and the samples were submitted to Hall Environmental Laboratory, Albuquerque NM and analyzed for parameters set forth in the VZM Plan, Table 1.

Well VZ-5 was installed on 11/15/17. The well was advanced to a depth of 25 feet and penetrated 3 feet into dense clayey shale in the Chinle. The well was screened in the interval 20-30 feet below land surface. No fluids were detected in well VZ-5 during drilling or in post completion inspections.

Well VZ-6 was installed on 11/15/17. The well was drilled to a depth of 23 feet and penetrated 3.5 feet of dense clayey shale in the Chinle. The well was screened in the interval 13-23 feet below land surface. No fluids were detected in well VZ-6 during drilling or in post completion inspections.

Well VZ-7 was installed on 11/14/17. The well was advanced to a depth of 49 feet, penetrating 2 feet of dense, clayey Chinle shale. Saturated sediments were observed from a depth of 14 feet

to the top of the shale. The well was screened in the interval 14-49 feet below land surface. Fluid level was approximately 17 feet below grade upon completion of the well and was observed to be approximately 16 feet below the top of the casing on 11/20/17. The well was purged and sampled on 11/20/17 and the samples were submitted to Hall Environmental Laboratory, Albuquerque NM and analyzed for parameters set forth in the VZM Plan, Table 1.

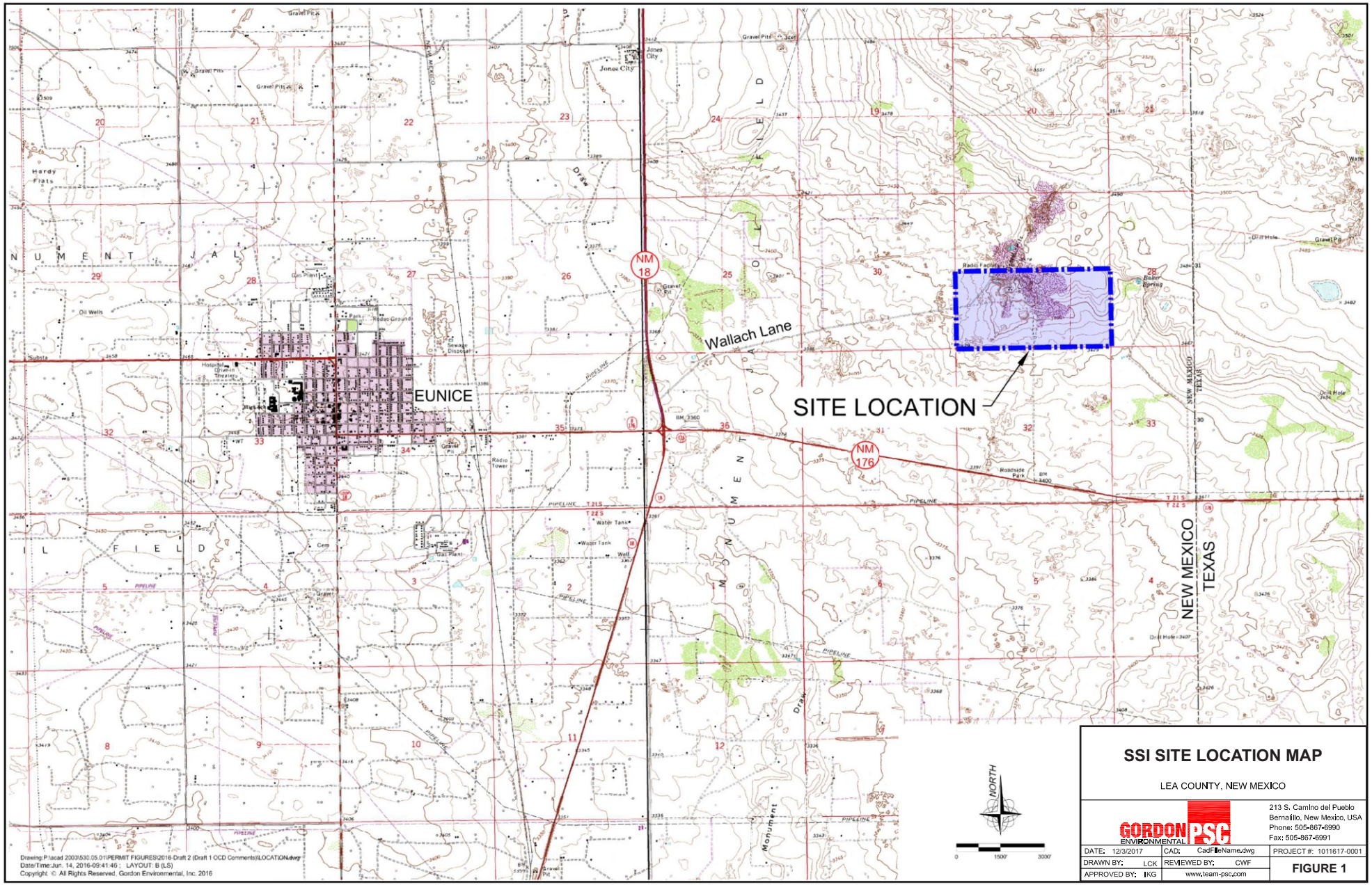
6.0 CONCLUSIONS

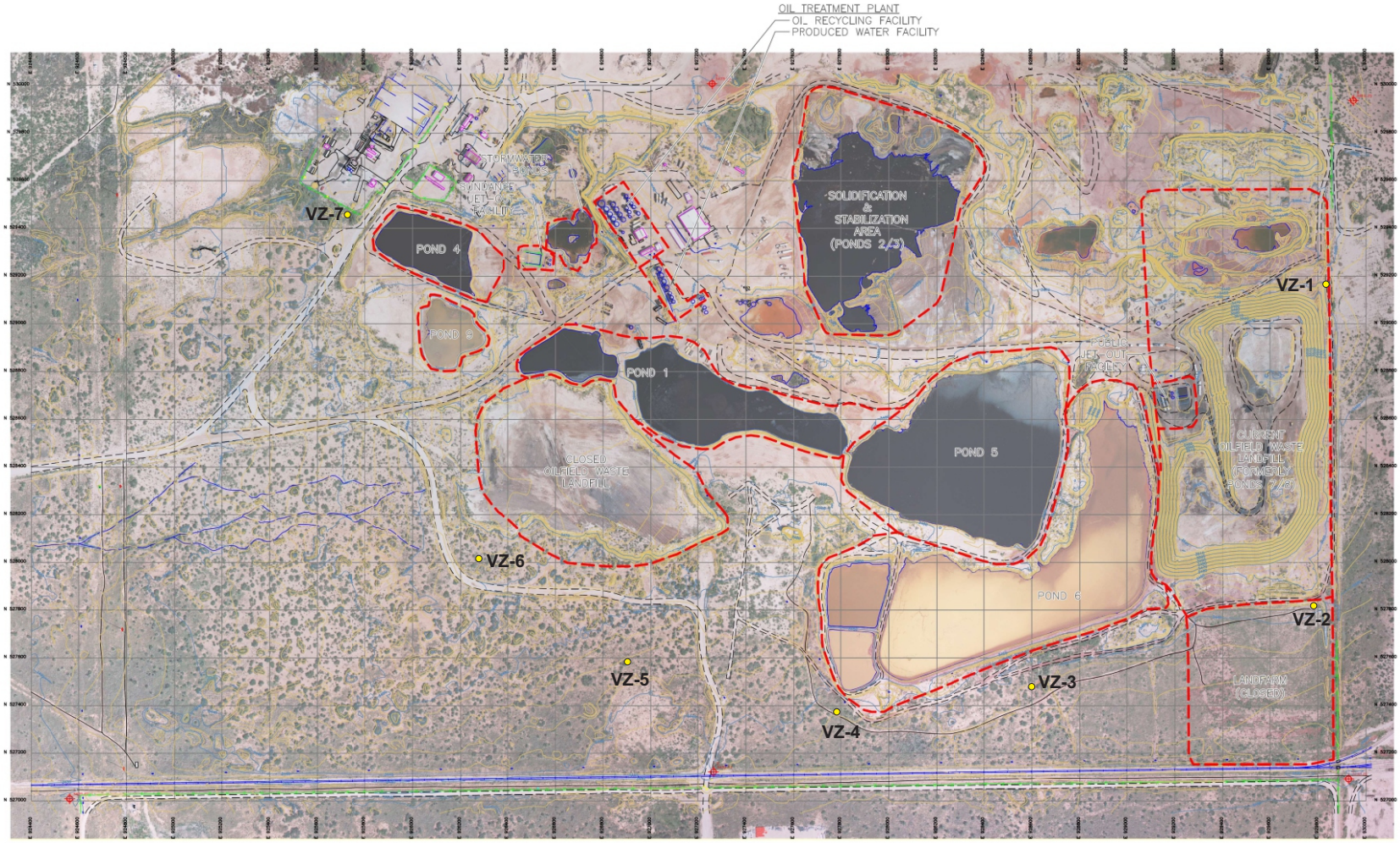
This submittal completes the VZM Plan commitments for VZM Well completion and initial monitoring. Subsurface fluid saturations were penetrated in wells VZ-1, VZ-3, VZ-4 and VZ-7. Wells VZ-4 and VZ-7 were purged and sampled on 11/20/2017. It is anticipated that results of laboratory analyses of the 11/20/17 samples will be transmitted to NMOCD in a document that will be appended to this report.

7.0 REFERENCES

1. Gordon Environmental, September 2016, Closure/Post Closure Plan, Sundance Services, Inc. Consultant report prepared for Sundance Services, Inc.
2. Barnes, V., 1976, Geologic Atlas of Texas, Hobbs Sheet, Texas Bureau of Economic Geology

FIGURES 1-3


EUNICE
SITE LOCATION
Wallach Lane
NM 18
NM 176
NEW MEXICO
TEXAS
NORTH
0
1500'
3000'
SSI SITE LOCATION MAP
LEA COUNTY, NEW MEXICO
GORDON PSC ENVIRONMENTAL
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991
DATE: 12/3/2017
CAD: CadFileName.dwg
PROJECT #: 1011617-0001
DRAWN BY: LCK
REVIEWED BY: CWF
APPROVED BY: IKG
www.team-psc.com
FIGURE 1
Drawing:P:\acad 2003\530.05.01\PERMIT FIGURES\2016 Draft 2 (Draft 1 OCD Comments\LOCATION.dwg
Date/Time:Jun. 14, 2016-09:41:46 ; LAYOUT: B (LS)
Copyright © All Rights Reserved. Gordon Environmental, Inc. 2016



VZ-4 VADOSE ZONE WELL LOCATION SHOWING DESIGNATION

LEGEND
APPROXIMATE UNIT BOUNDARIES

NOTE:
SEPTEMBER 9, 2014 AERIAL PHOTOGRAPHY PERFORMED BY BLUE SKIES CONSULTING LLC. MAPPING PERFORMED BY AEROTECH MAPPING INC.

NORTH

0 200' 400'

SSI VADOSE ZONE MONITORING WELL LOCATIONS

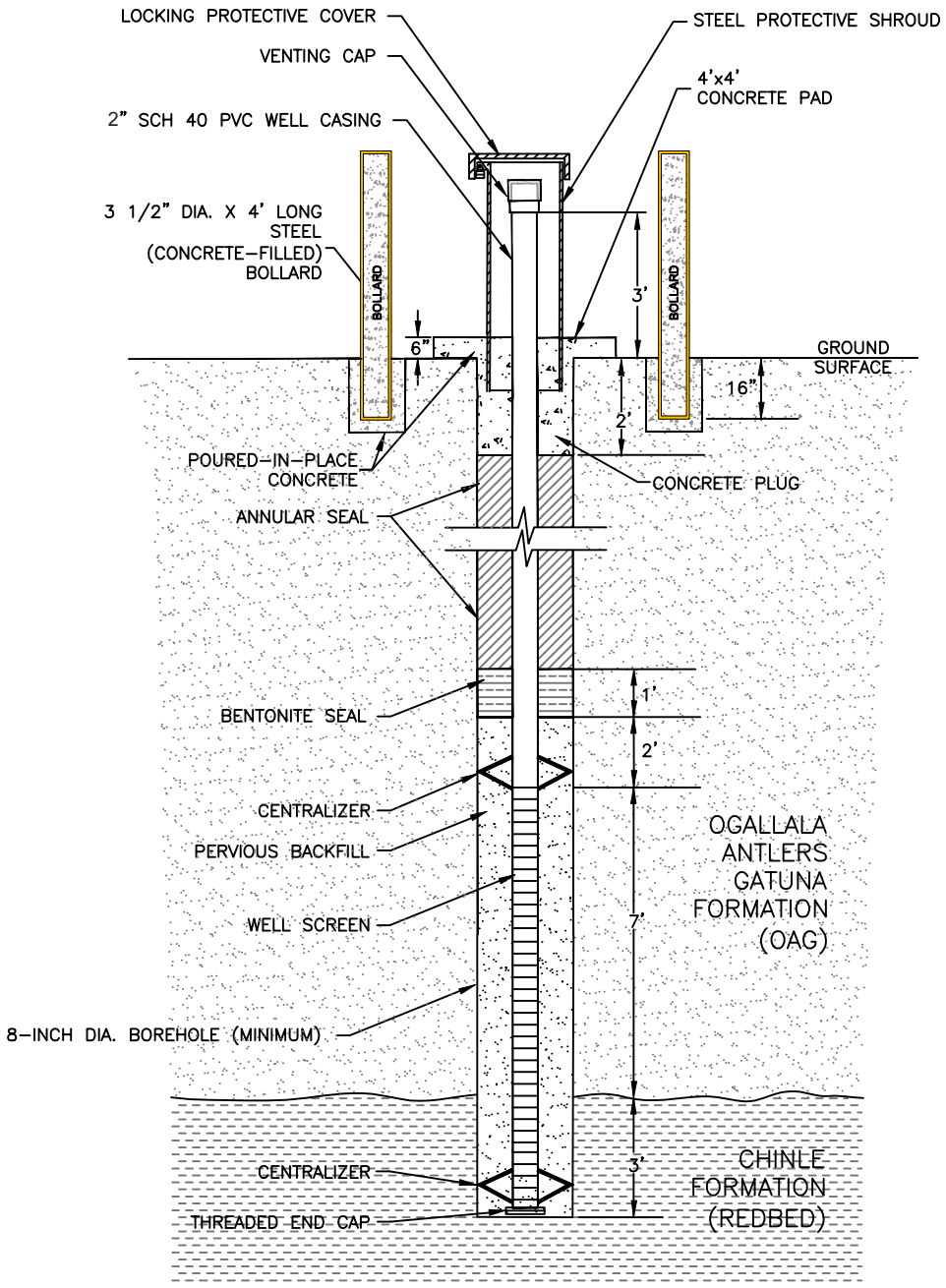
LEA COUNTY, NEW MEXICO

GORDON ENVIRONMENTAL PSC

213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 12/3/2017	CAD: CadFileName.dwg	PROJECT #: 1011617-0001
DRAWN BY: LCK	REVIEWED BY: CWF	FIGURE 2
APPROVED BY: IKG	www.team-psc.com	

Drawing/P:\acad 2003\530.05.01\PERMIT FIGURES\2016-Draft 2 (Draft 1 OCD Comments)\EXISTING SITE FET.dwg
Date/Time:Sep. 09, 2016-11:40:34 ; LAYOUT:D (LS)



LEGEND

CASING: 2' DIA. FLUSH JOINT THREADED SCH 40 PVC

SCREEN: 2' DIA 0.010 MACHINE SLOT FLUSH JOINT THREADED SCH 40 PVC

PERVIOUS ANNULAR FILL: 20-40 COLORADO SILICA SAND OR EQUIVALENT

BENTONITE SEAL: 1/4-INCH BENTONITE PELLETS, HYDRATED

GROUT SEAL: PORTLAND NEAT CEMENT, 5% BENTONITE ADMIX

CENTRALIZERS: WELLS BUILT INSIDE AUGERS, CENTRALIZERS NOT NECESSARY OR USED

NOTE:

SPECIFIC DIMENSIONS FOR EACH COMPLETED WELL SHOWN ON WELL LOGS AND SUMMARIZED IN TABLE 1

SSI GENERAL VADOSE ZONE WELL COMPLETION DETAILS

LEA COUNTY, NEW MEXICO

GORDON PSC ENVIRONMENTAL
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 12/3/2017	CAD: CadFileName.dwg	PROJECT #: 1011617-0001
DRAWN BY: LCK	REVIEWED BY: CWF	FIGURE 3
APPROVED BY: IKG	www.team-psc.com	

TABLE 1

LOCATIONS AND COMPLETION DETAILS, VADOSE ZONE MONITORING WELLS

Table 1.--Locations and Completion Details of Vadose Zone Monitoring Wells, Sundance Services Facility, Lea County, NM

Site Vadoze Zone Well No.	NMOSE Well Permit No	Latitude			Longitude			Depth (ft)	Depth to Top Chinle (ft)	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)	Depth to Water (ft)	Saturation Above Chinle (ft)	Comments
		Deg	Min	Sec	Deg	Min	Sec							
VZ-1 (PGI-8)	CP-1014	32	26	54.2	103	4	26.0	28.5	27	*23.5	*28.5	24.44	2.56	Completed 4/12/2009, measured from LS
VZ-2	CP-1692-POD 1	32	26	41.2	103	4	26.7	35	29	25	35	dry	0	Measured 11/17/17 from LS
VZ-3	CP-1692-POD 2	32	26	37.4	103	4	40.6	60	35	50	60	dry	0	Measured 11/15/17 from LS
												47.55	-12.55	Measured 11/20/17 ftom top casing
VZ-4	CP-1692-POD 3	32	26	36.0	103	4	50.9	25	22.5	15	25	15	7.5	Measured 11/15/17 from LS
												4	18.5	Measured 11/20/17 ftom top casing
VZ-5	CP-1692-POD 4	32	26	38.9	103	5	0.3	30	27	20	30	dry	0	Measured 11/15/17 from LS
VZ-6	CP-1692-POD 5	32	26	43.6	103	5	7.8	23	20	13	23	dry	0	Measured 11/15/17 from LS
VZ-7	CP-1692-POD 6	32	26	57.9	103	5	14.0	49	47	14	49	17	30	Measured 11/14/17 from LS
												16.38	30.62	Measured 11/20/17 from top casing

Notes

All depths, feet below land surface

*Screen settings estimated from well log, Attachment C

ATTACHMENT A

NMOSE PERMITS FOR VADOSE ZONE MONITORING WELLS

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ROSWELL

John R. D'Antonio, Jr., P.E.
State Engineer

1900 West Second Street
Roswell, NM 88201
Phone: (575) 622-6521
Fax: (575) 623-8559

April 10, 2009

Sundance Services, Inc.
% Larry M. Coons, P.E.
Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004

RE: Monitoring Wells – CP-1014; CP-1015; CP-1016; CP-1017; CP-1018; CP-1019

Greetings:

Enclosed is your copy of the Monitoring Well permits, which have been approved subject to the conditions set forth on the approval page thereof.

In accordance with Condition C, a well record shall be filed in this office twenty days after completion of drilling. The well record is proof of completion of well. IT IS YOUR RESPONSIBILITY TO ASSURE THAT THE WELL LOG IS FILED WITHIN 20 DAYS OF DRILLING OF THE WELL.

These permits will expire on or before 04/30/2010, unless the wells have been drilled and the well logs filed in this office.

Sincerely,

for

Andy Morley, Staff Manager
(575) 622-6521, ext 113

Enclosure

cc: Santa Fe Office

NEW MEXICO STATE ENGINEER
PERMIT TO MONITOR

SPECIFIC CONDITIONS OF APPROVAL

4 No water shall be appropriated and beneficially used under this permit.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated.

C Driller's well record must be filed with the State Engineer within 20 days after the well is drilled or driven. Well record forms will be provided by the State Engineer upon request.

No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days unless a permit to use water from this well is acquired from the Office of the State Engineer.

Should the permittee change the purpose of use to other than monitoring purposes, an application shall be acquired from the Office of the State Engineer.

The proposed well shall be drilled at least 660 feet from all wells of other ownership.

The well shall be constructed, maintained, and operated that each water shall be confined to the aquifer in which it is encountered.

LOG The Point of Diversion CP-1014 must be completed and the Well Log filed on or before 04/30/2010.

ACTION OF STATE ENGINEER

Notice of Intention Rcvd:		Date Rcvd. Corrected:	
Formal Application Rcvd:	04/01/2009	Pub. Of Notice Ordered:	
Date Returned – Correction:		Affidavit of Pub. Filed:	

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 9 day of April A.D., 2009.

John R. D'Antonio, Jr., P.E., State Engineer

By: _____
Kenneth M. Fresquez, District II Manager

File Number: _____
(For OSE Use Only)

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT
TO DRILL AN EXPLORATORY WELL

1. APPLICANT:

Name: Sundance Services, Inc. Work Phone: 575-394-2511
Contact: Mr. Joe Carrillo, Plant Manager Home Phone: _____
Address: 1001 6th Street
City: Eunice State: NM Zip: 88231

2. LOCATION OF WELL (A, B, C, or D required, E or F if known): PGI-8

A. NW 1/4 NW 1/4 SW 1/4 Section: 28 Township: 21S Range: 38E N.M.P.M.
in Lea County County.

B. X = _____ feet, Y = _____ feet, N.M. Coordinate System
_____ Zone in the _____ Grant.
U.S.G.S. Quad Map _____

C. Latitude: 32 d 26 m 54.6 s Longitude: 103 d 4 m 25.8 s

D. East 681061 (m), North 3591783 (m), UTM Zone 13, NAD __ (27 or (83))

E. Tract No. _____, Map No. _____ of the _____ Hydrographic Survey

F. Lot No. _____, Block No. _____ of Unit/Tract _____ of the
_____ Subdivision recorded in _____ County.

G. Other: _____

H. Give State Engineer File Number of existing well: _____

I. On land owned by (required): Sundance Services, Inc. (through lease authorization)

3. WELL INFORMATION:

Approximate depth 125 feet; Outside diameter of casing 2 inches.
Name of well driller and driller license number Rodgers - NMWD 225

4. ADDITIONAL STATEMENT OR EXPLANATIONS:

To evaluate subsurface groundwater.

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2022 APR -7 A 10:58

Do Not Write Below This Line

File Number: CP-1014 Trn Number: 428003
Form: wr-07 page 1 of 2

File Number: _____
(For OSE Use Only)

NEW MEXICO OFFICE OF THE STATE ENGINEER
APPLICATION FOR PERMIT
TO DRILL AN EXPLORATORY WELL

ACKNOWLEDGEMENT

(I, We) Joe Carrillo for Sundance Services, Inc. affirm that the
(Please Print)
foregoing statements are true to the best of my knowledge and belief.

_____ _____.
Applicant Signature Applicant Signature

ACTION OF STATE ENGINEER

This application is approved/xxxxxxxxxxxxxxxxxxxxxxxxxx provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare, and further subject to the following conditions: _____

see attached conditions of approval

Witness my hand and seal this 9 day of April, 20 09

John R. D'Antonio, Jr., P.E, State Engineer

By: Andy Mody
Kenneth M. Fresquez, District II Manager

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO
2009 APR -1 A 10:58

Do Not Write Below This Line

File Number: CP-1014 Trn Number: 428003
Form: wr-07 page 2 of 2

PGI-4

Locator Tool Report

General Information:

Application ID: 28 Date: 04-02-2009 Time: 11:18:43

WR File Number: CP
Purpose: POINT OF DIVERSION

Applicant First Name: SUNDANCE
Applicant Last Name: SERVICES

GW Basin: CAPITAN
County: LEA

Critical Management Area Name(s): NONE
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

SW 1/4 of NW 1/4 of NW 1/4 of SW 1/4 of Section 28, Township 21S, Range 38E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	54.6 Seconds	N
Longitude:	103 Degrees	4 Minutes	25.8 Seconds	W

Universal Transverse Mercator Zone: 13N

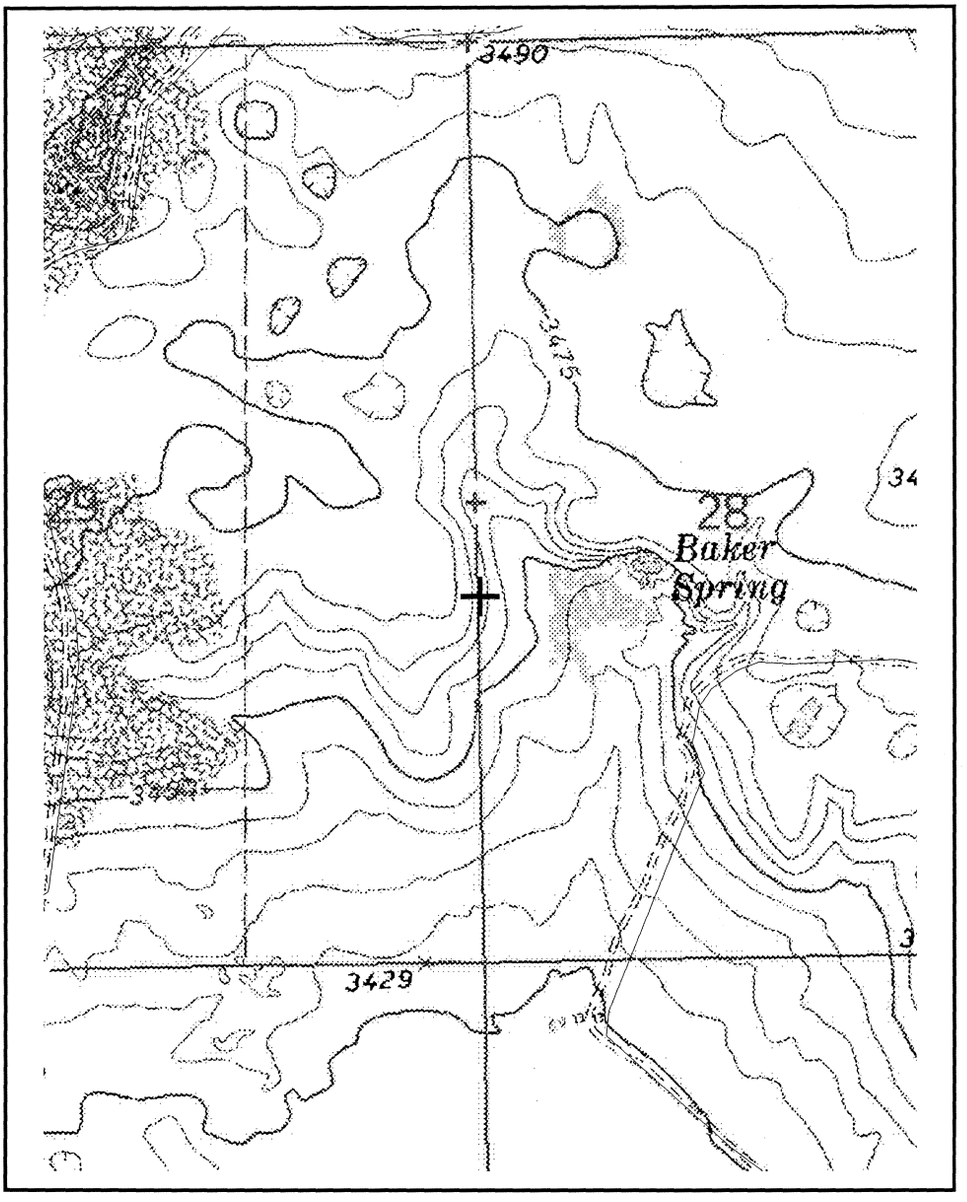
NAD 1983(92) (Meters)	N: 3,591,783	E: 681,061
NAD 1983(92) (Survey Feet)	N: 11,784,041	E: 2,234,448
NAD 1927 (Meters)	N: 3,591,607	E: 681,021
NAD 1927 (Survey Feet)	N: 11,783,464	E: 2,234,316

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 161,296	E: 283,426
NAD 1983(92) (Survey Feet)	N: 529,184	E: 929,872
NAD 1927 (Meters)	N: 161,304	E: 270,784
NAD 1927 (Survey Feet)	N: 529,212	E: 888,398

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: CP Scale: 1:13,123

Northing/Easting: UTM83(92) (Meter): N: 3,591,783 E: 681,061

Northing/Easting: SPCS83(92) (Feet): N: 529,184 E: 929,872

GW Basin: Capitan

Tom Blaine, P.E.
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Trn Nbr: 614132
File Nbr: CP 01692 POD1-6

Sep. 27, 2017

Received
OCT 02 2017
Gordon Environmental / PSC

CLAY KILMER, GORDAN ENVIRO PSC
GORDAN ENVIRONMENTAL PSC
213 S CAMINO DEL PUEBLO
BERNALILLO, NM 87004

Greetings:

Enclosed is your copy of the above numbered permit that has been approved subject to the conditions set forth on the approval page. In accordance with the conditions of approval, the well can only be tested for 10 cumulative days, and the well is to be plugged on or before 09/30/2018, unless a permit to use the water is acquired from this office.

A Well Record & Log (OSE Form wr-20) shall be filed in this office within twenty (20) days after completion of drilling, but no later than 09/30/2018.

Appropriate forms can be downloaded from the OSE website www.ose.state.nm.us or will be mailed upon request.

Sincerely,

Juan Hernandez
(575)622-6521

Enclosure

explore

4. SPECIFIC REQUIREMENTS: The applicant must include the following, as applicable to each well type. Please check the appropriate boxes, to indicate the information has been included and/or attached to this application:

Exploratory:	**Pollution Control and/or Recovery:**	**Construction De-Watering:**	**Mine De-Watering:**
☐ Include a description of any proposed pump test, if applicable.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for the pollution control or recovery operation. ☐ The estimated maximum period of time for completion of the operation. ☐ The annual diversion amount. ☐ The annual consumptive use amount. ☐ The maximum amount of water to be diverted and injected for the duration of the operation. ☐ The method and place of discharge. ☐ The method of measurement of water produced and discharged. ☐ The source of water to be injected. ☐ The method of measurement of water injected. ☐ The characteristics of the aquifer. ☐ The method of determining the resulting annual consumptive use of water and depletion from any related stream system. ☐ Proof of any permit required from the New Mexico Environment Department. ☐ An access agreement if the applicant is not the owner of the land on which the pollution plume control or recovery well is to be located.	☐ Include a description of the proposed dewatering operation, ☐ The estimated duration of the operation, ☐ The maximum amount of water to be diverted, ☐ A description of the need for the dewatering operation, and, ☐ A description of how the diverted water will be disposed of.	☐ Include a plan for pollution control/recovery, that includes the following: ☐ A description of the need for mine dewatering. ☐ The estimated maximum period of time for completion of the operation. ☐ The source(s) of the water to be diverted. ☐ The geohydrologic characteristics of the aquifer(s). ☐ The maximum amount of water to be diverted per annum. ☐ The maximum amount of water to be diverted for the duration of the operation. ☐ The quality of the water. ☐ The method of measurement of water diverted. ☐ The recharge of water to the aquifer. ☐ Description of the estimated area of hydrologic effect of the project. ☐ The method and place of discharge. ☐ An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. ☐ A description of the methods employed to estimate effects on surface water rights and underground water rights. ☐ Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.
Monitoring: ■ Include the reason for the monitoring well, and, ■ The duration of the planned monitoring.		**Ground Source Heat Pump:** ☐ Include a description of the geothermal heat exchange project, ☐ The number of boreholes for the completed project and required depths. ☐ The time frame for constructing the geothermal heat exchange project, and, ☐ The duration of the project. ☐ Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	

ACKNOWLEDGEMENT

I, We (name of applicant(s)), Clay Kilmer, Gordon Environmental-PSC
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Applicant Signature

Applicant Signature

2017 SEP 14 PM 3 26 OSE ROSWELL NM

ACTION OF THE STATE ENGINEER

This application is:

☒ approved ☐ partially approved ☐ denied

provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare and further subject to the attached conditions of approval.

Witness my hand and seal this 27th day of September 20 17, for the State Engineer,

Tom Blaine, P.E., State Engineer

By: _____ _____
Signature Print

Title: Juan Hernandez, Water Resources Manager 1
Print

FOR OSE INTERNAL USE Application for Permit, Form WR-07

File No.: CP-1692 Trn No.: 614132

File No.

NEW MEXICO OFFICE OF THE STATE ENGINEER

WR-07 APPLICATION FOR PERMIT TO DRILL A WELL WITH NO WATER RIGHT

(check applicable box):

For fees, see State Engineer website: http://www.ose.state.nm.us/

Purpose:	☐ Pollution Control And/Or Recovery	☐ Ground Source Heat Pump
☐ Exploratory Well (Pump test)	☐ Construction Site/Public Works Dewatering	☐ Other(Describe):
☒ Monitoring Well	☐ Mine Dewatering	

A separate permit will be required to apply water to beneficial use regardless if use is consumptive or nonconsumptive.

☐ Temporary Request - Requested Start Date: Requested End Date:

Plugging Plan of Operations Submitted? ☒ Yes ☐ No

1. APPLICANT(S)

Name: Sundance Services, Inc.	Name: Clay Kilmer, Gordon Environmental-PSC
Contact or Agent: check here if Agent ☐	Contact or Agent: check here if Agent ☒
Mailing Address: PO Box 1737	Mailing Address: 213 S. Camino del Pueblo
City: Eunice	City: Bernalillo
State: New Mexico Zip Code: 88231	State: New Mexico Zip Code: 87004
Phone: Phone (Work): ☐ Home ☐ Cell	Phone: 505-235-4482 Phone (Work): ☐ Home ☒ Cell
E-mail (optional):	E-mail (optional):

FOR OSE INTERNAL USE Application for Permit, Form WR-07, Rev 11/17/16

File No.:	Trn. No.:	Receipt No.:
Trans Description (optional):		
Sub-Basin:	PCW/LOG Due Date:	

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
CP-1692 POD 1 VZ-2	103D 04M 26.8S	32D 26M 41.1S	T21S R38E S29.4442
CP-1692 POD2 VZ-3	103D 04M 40.7S	32D 26M 37.9S	T21S R38E S29.4432
CP-1692 POD3 VZ-4	103D 04M 50.4S	32D 26M 36.9S	T21S R38E S29.4332
CP-1692 POD4 VZ-5	103D 05M 00.4S	32D 26M 38.9S	T21S R38E S29.3441
CP-1692 POD5 VZ-6	103D 05M 00.4S	32D 26M 38.9S	T21S R38E S29.3413

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ■ **Yes** ☐ **No** **If yes, how many** 1

Other description relating well to common landmarks, streets, or other:

Well is on land owned by: Wallach Ranch, LLC, leased to Sundance Services, Inc. (owner of wells and 30-year site closure plan)

Well Information: NOTE: If more than one (1) well needs to be described, provide attachment. Attached? ☐ **Yes** ☐ **No**
If yes, how many_____

Approximate depth of well (feet): 45	Outside diameter of well casing (inches): 2
Driller Name: Talon Drilling	Driller License Number: 1575

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

These monitoring wells are requested pursuant to closure and post-closure monitoring of an oilfield wast disposal facility, Closure and Post-Closure monitoring is to be conducted in accordance with a Closure/Post Closure Plan for Sundance Services, Inc., filed September, 2016, with the NEW MEXICO ENERGY, MINERALS, AND NATURAL RESOURCES DEPARTMENT, OIL CONSERVATION DIVISION. Printed portions of the Closure Plan associated with groundwater and vadozse zone monitoring commitments are attached to this APPLICATION. Additionally, a digital disk copy of the complete Closure Plan is transmitted herewith. A copy of proposed well completion is attached.

FOR OSE INTERNAL USE — Application for Permit, Form WR-07

File No.: CP-1692	Trn No.: 614132

2. WELL(S) Describe the well(s) applicable to this application.

Location Required: Coordinate location must be reported in NM State Plane (NAD 83), UTM (NAD 83), or Latitude/Longitude (Lat/Long - WGS84).
District II (Roswell) and District VII (Cimarron) customers, provide a PLSS location in addition to above.

☐ NM State Plane (NAD83) (Feet)
☐ NM West Zone
☐ NM East Zone
☐ NM Central Zone

☐ UTM (NAD83) (Meters)
☐ Zone 12N
☐ Zone 13N

■ Lat/Long (WGS84) (to the nearest 1/10th of second)

Well Number (if known):	X or Easting or Longitude:	Y or Northing or Latitude:	Provide if known: -Public Land Survey System (PLSS) (*Quarters or Halves , Section, Township, Range*) OR - Hydrographic Survey Map & Tract; OR - Lot, Block & Subdivision; OR - Land Grant Name
CP-1692 POD 6 VZ-7	103D 05M 12.7S	32D 26M 57.8S	T21S R38E S29.3124

NOTE: If more well locations need to be described, complete form WR-08 (Attachment 1 – POD Descriptions)
Additional well descriptions are attached: ■ **Yes** ☐ **No** **If yes, how many** 1

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FOR OSE INTERNAL USE — Application for Permit, Form WR-07

File No.: CP- 1692	Trn No.: 614132

CLOSURE/POST-CLOSURE PLAN

SUNDANCE SERVICES, INC.

SEPTEMBER 2016

Prepared For:

Sundance Services, Inc.
1001 6th Street
Eunice, NM 88231

Submitted To:

New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505
505.476.3440

Prepared By:

Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004
505.867.6990

Gordon Environmental, Inc.
Consulting Engineers

505.867.6990
505.867.6991 Fax
GORDON ENVIRONMENTAL, INC.
213 S. Camino del Pueblo
Bernalillo, New Mexico 87004

20 Years

September 29, 2016

Mr. Jim Griswold, Bureau Chief
Environmental Bureau
Oil Conservation Division
New Mexico Energy, Minerals and
Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Sundance Services, Inc. Surface Waste Management Facility [530.05.01] Closure/Post-Closure Plan

Dear Mr. Griswold:

On behalf of our client, Sundance Services, Inc (SSI), Gordon Environmental, Inc. (GEI) is pleased to submit the enclosed Closure/Post-closure Plan (the Plan) for the existing Sundance Services, Inc. Surface Waste Management Facility to the Oil Conservation Division (OCD). This Plan addresses the closure requirements of the New Mexico (NM) Oil and Gas Rules, specifically the Surface Waste Management Facility Permit (NM-01-003) and the applicable standards in 19.15.36 NMAC and was updated to reflect the comments received from Mr. Jim Jordon.

We look forward to working with you and the OCD regarding the final approval of the Sundance Services, Inc. Closure/Post-closure Plan. Please contact GEI at 505.867.6990 or cfiedler@gordonenvironmental.com with your comments and questions.

Very truly yours,
Gordon Environmental, Inc.

Charles W. Fiedler, P.E.
Sr. Project Director

cc: Mr. Arif Musani, Sundance Services, Inc.
Mr. Andrew L. Wambsganss, Brown-Pruitt

Attachments: Sundance Services, Inc., Closure/Post-closure Plan

CLOSURE/POST-CLOSURE PLAN
SUNDANCE SERVICES, INC.

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SUNDANCE SERVICES, INC.

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SUNDANCE SERVICES, INC.

ATTACHMENT D
VADOSE ZONE MONITORING PLAN

SUNDANCE SERVICES, INC.

VADOSE ZONE MONITORING PLAN

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SUNDANCE SERVICES, INC.

VADOSE ZONE MONITORING PLAN

1.0 INTRODUCTION

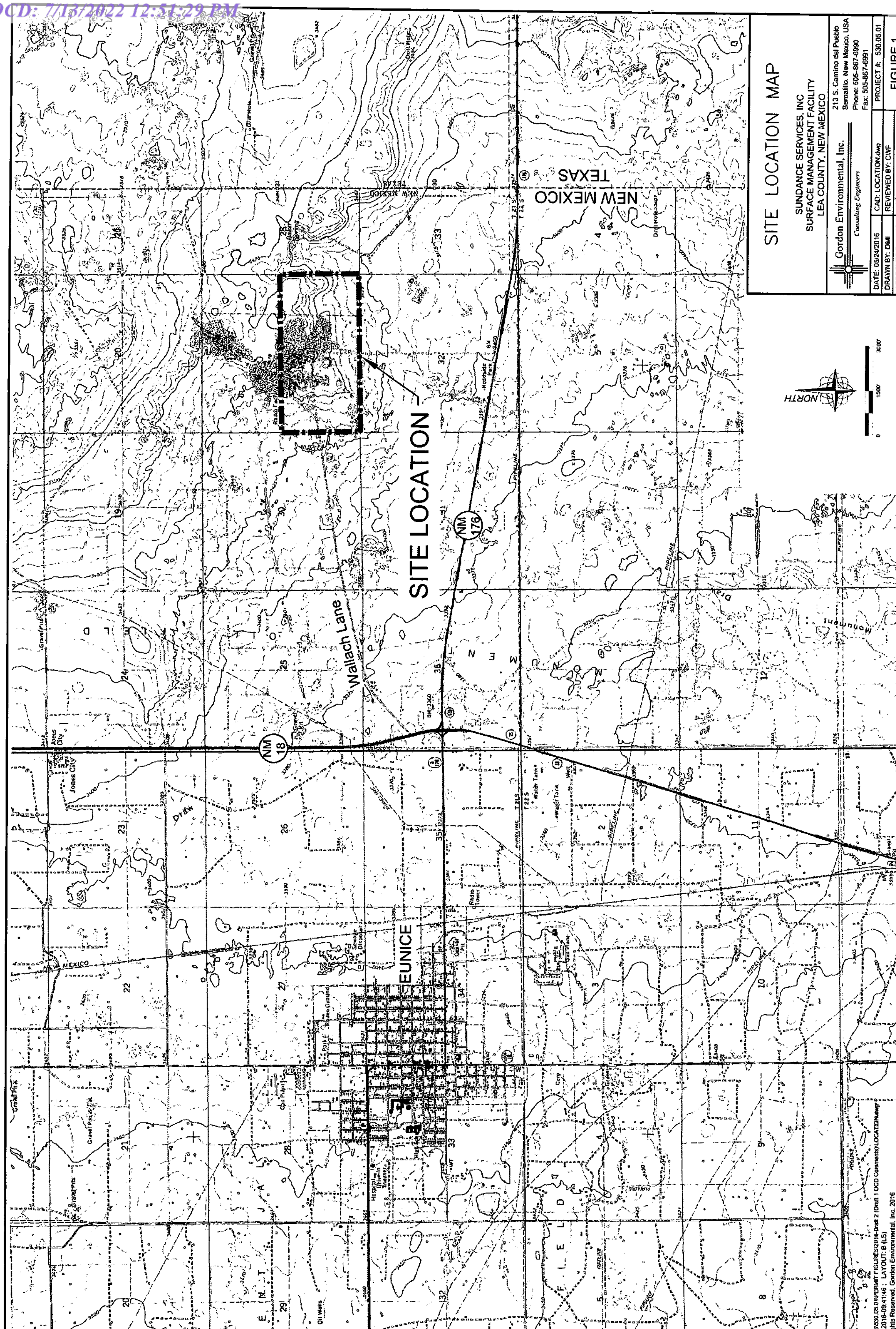
Sundance Services, Inc. (SSI Facility) is an operational Surface Waste Management Facility for oil field waste processing and disposal services. The proposed SSI Facility is subject to regulation under the New Mexico Oil and Gas Rules, specifically Part 36 and Permit NM-01-0003, administered by the Oil Conservation Division (OCD). The Facility is owned by, and will be constructed and operated by, Sundance Services, Inc.

1.1 Purpose

The purpose of this Vadose Zone Monitoring Plan (the Plan) is to provide SSI plans for the monitoring, recordkeeping, and reporting procedures for the site's vadose zone monitoring system during a subsequent to closure. The Plan, as presented herein, is based, in part, on the proposed Closure and Post-closure Plan that this plan is attached to.. This Plan identifies the locations of up to five vadose zone monitoring points that are positioned appropriately to provide for early detection of potential fluid releases at the site; and provides additional guidance for monitoring point installation.

1.2 Site Location

The SSI Facility is located approximately 3 miles east of Eunice, NM; 18 miles south of Hobbs, NM; and approximately 0.5 miles west of the TX/NM state line in unincorporated Lea County, NM. The SSI site is comprised of a 320-acre ± tract of land located in the South ½ of Section 29, Township 21 South, Range 38 East, Lea County, NM. Site access will continue to be provided via NM 18 and Wallach Lane. Access may also be provided via replacement access through the proposed Sundance West, Inc. Surface Waste Management Facility (Sundance West). A Site Location Map is provided as **Figure 1**.


SITE LOCATION MAP
SUNDANCE SERVICES, INC
SURFACE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO
Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991
DATE: 05/24/2016
CAD: LOCATION.dwg
PROJECT #: 530.05.01
DRAWN BY: DMI
REVIEWED BY: CWF
APPROVED BY: IKG
gei@gordonenvironmental.com
FIGURE 1
SITE LOCATION
Wallach Lane
EUNICE
NM 18
NM 176
NEW MEXICO
TEXAS
NORTH
Copyright © All Rights Reserved, Gordon Environmental, Inc. 2016

1.3 Facility Description

The SSI Facility is an existing commercial Surface Waste Management Facility that includes the following components, which are also identified on **Figure 2**:

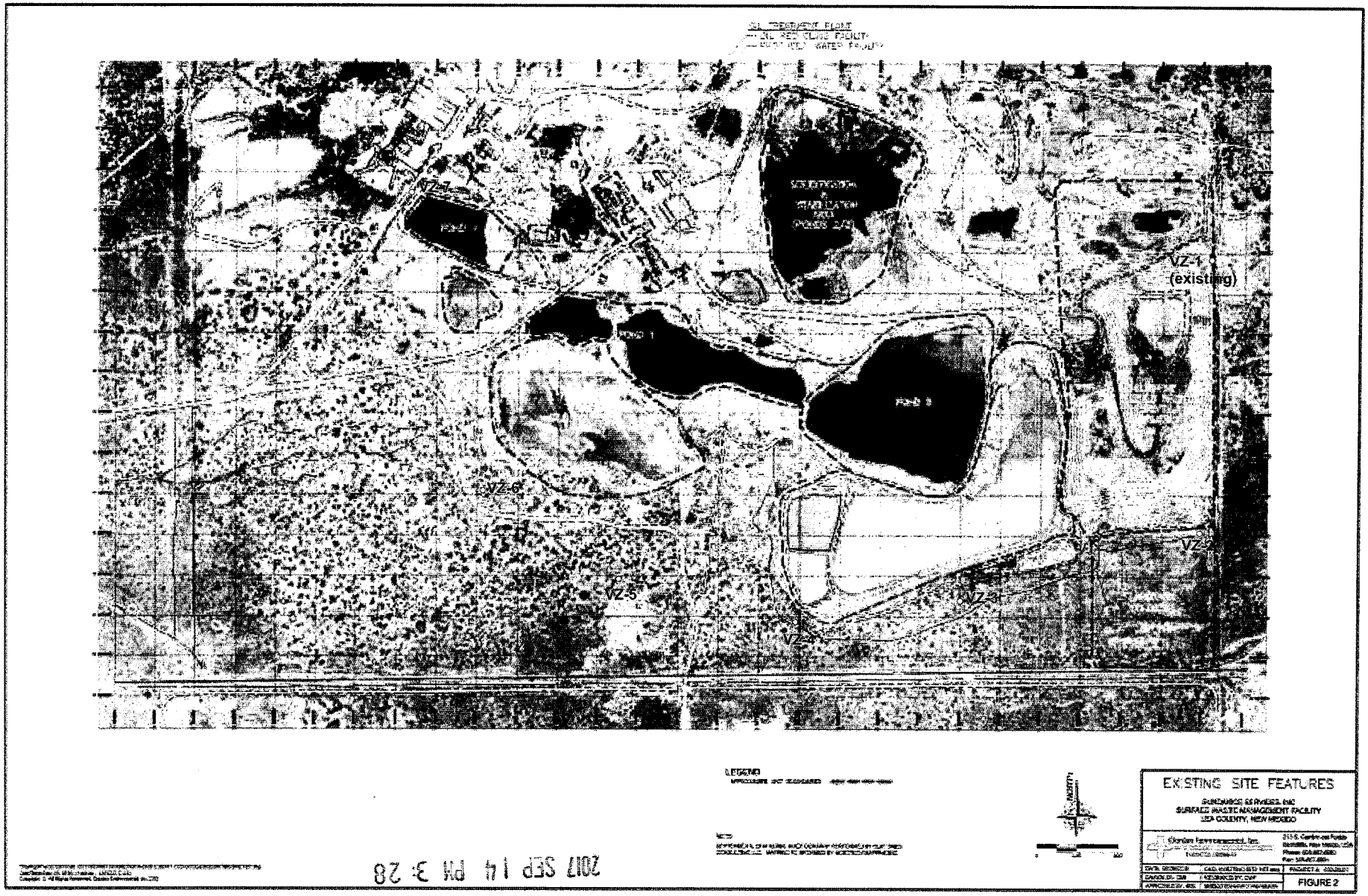
- Liquid Oil Field Waste Processing Area (80 acres ±)
  - Produced Water Facility
  - Drilling Fluids
  - Basic Sediment and Water (BS&W)
  - Jet Out Facility (SSI and Public)
  - Oil Recycling Facility
- Oil Field Waste Landfill (80 acres ±, Old and Current).
- Landfarm (Previously Closed with OCD)

2.0 VADOSE ZONE MONITORING NETWORK

The proposed vadose zone monitoring system for the SSI Facility is designed to provide for earliest possible detection of potential fluid releases from the closed Landfill and Ponds. The hydrogeologic setting lies near the boundary between the Southern High Plains Section and the Pecos Valley Section of the Great Plains Physiographic Province. The physiographic province is characterized by mildly deformed Triassic and Permian sedimentary rocks capped by the late Miocene-Pliocene Ogallala Formation. The local Site region is underlain primarily by the Late Tertiary/Quaternary-aged pedogenic caprock caliche that developed on all pre-Quaternary formations on the southern High Plains. Young windblown sands of the Blackwater Draw Formation (BDF) overlie the caprock caliche. Unconsolidated to semi-consolidated sands and gravels of the Ogallala, Antlers, and Gatuña Formations (locally referred to as OAG) lie between the caprock and underlying red beds of the Dockum Group (Chinle Group). In summary, the vadose zone monitoring wells (VZs) will be positioned such that downgradient wells are located downslope on the mapped redbed surface (i.e., Chinle Formation) to the east, south and west of the Facility. No upgradient wells are proposed considering that the OAG has been excavated, exposing the redbed surface north of the SSI Facility (**Figure 2**). The redbed structure map provided as **Figure 3** presents a detailed depiction of the terrain on the redbed surface at the Facility; as well as a high confidence level that the proposed downgradient VZs are positioned directly downslope from the closed waste disposal areas in the zone most appropriate for detection of a potential release.

2.1 Monitoring Well Locations

Figure 3 depicts the location of the proposed vadose zone monitoring network designed specifically to address both the known slope of the redbed surface relative to the closed Landfills and Ponds.



The monitoring network strategy consists of the following elements, which are designed to correlate with the closed Landfills and Ponds shown in **Figure 3**:

1. Well VZ-1 is an existing well that was installed in 2009, east of and downgradient to the Landfills eastern boundary. This installation meets the specifications referenced in Section 2.2.
2. Following approval of the Closure Plan, wells VZ-2, VZ-3, VZ-4 and VZ-5 will be installed to evaluate ambient conditions; and will be constructed in accordance with the specifications listed in Section 2.2. Wells VZ-2, VZ-3, VZ-4 and VZ-5 will be positioned as "sentinel" downgradient wells around the remainder of the closed perimeter, and are specifically located in proximity to identified depressions in the redbed interface (See **Figure 3**) where liquids would be expected to accumulate.

2.2 Well Drilling and Completion

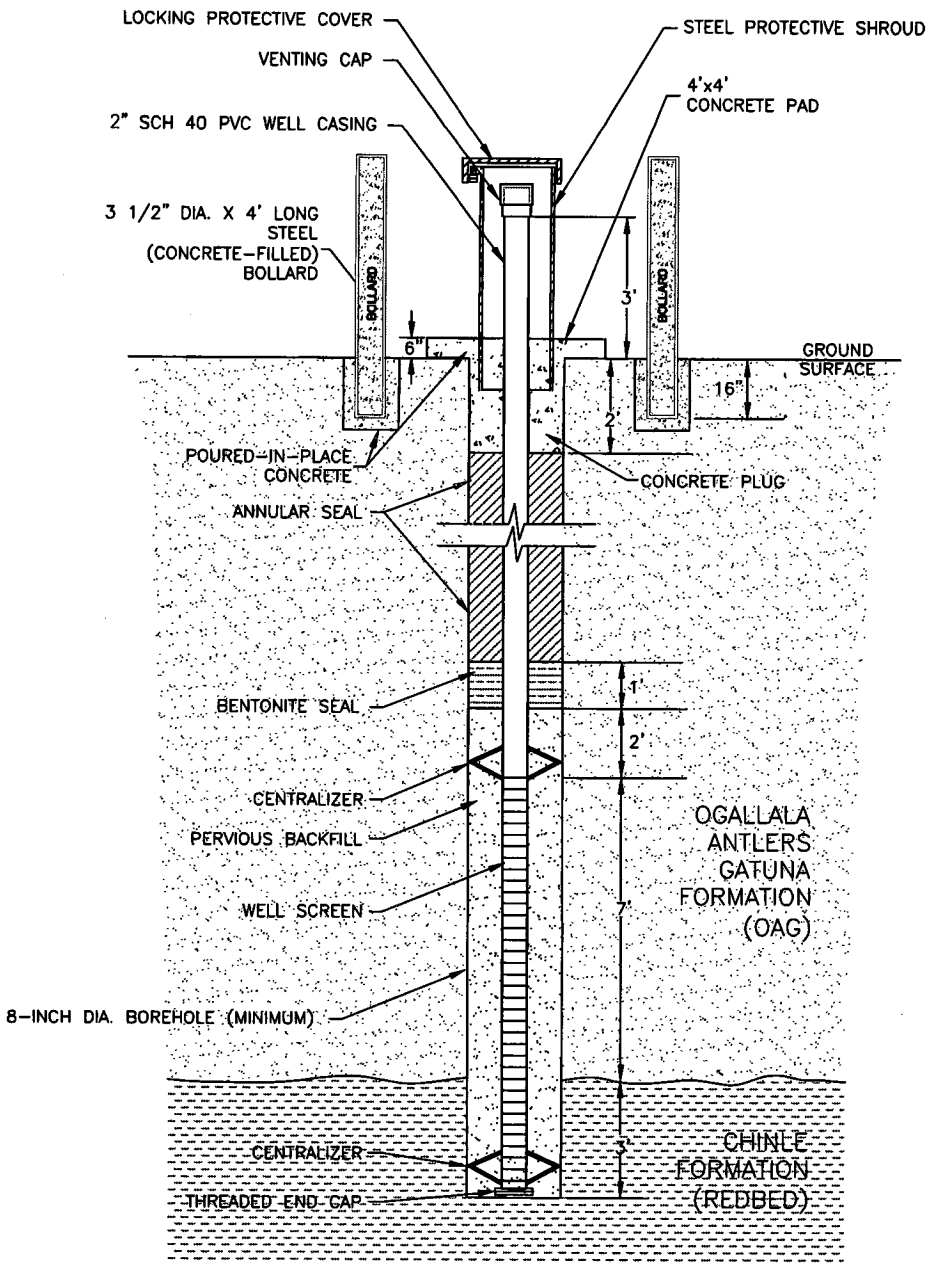
Prior to installation of the vadose zone monitoring wells, drilling permits will be obtained from the New Mexico Office of the State Engineer (NMOSE). The vadose zone monitoring wells will be installed using hollow-stem auger drilling methods; and no fluids will be introduced into the borings during drilling. Undisturbed, depth-referenced samples of penetrated sediments will be collected on at least 5-ft intervals using split-spoon sampling equipment. Drive blow counts will be logged during each sampling interval to allow precise determination of the upper redbed surface in each boring; which has typically been well-defined during other subsurface investigations. A qualified hydrogeologist will be present on-site during drilling activities; and will prepare detailed descriptions of the lithology, texture, sorting, rounding, color, and degree of lithification and moisture content of each sample and stratigraphic unit that is penetrated.

Although split-spoon sampling offers ample opportunity to identify saturated sediments with a high degree of confidence, each boring will be further evaluated for the presence of free water. Upon reaching total depth, the drilling rig will be placed on standby for a minimum of two hours, during which time the inside of the augers will be sounded to check for the potential for accumulating fluid.

The vadose zone monitoring wells will be constructed in accordance with the specifications set forth in **Table 1**, and the well detail sheet provided as **Figure 4**:

TABLE 1
Vadose Zone Monitoring Well Installation Specifications
Sundance Services, Inc.

- The well borehole will be drilled a minimum of 4 inches (in) larger than the casing diameter to allow for the emplacement of the well casing and annular space materials.
- Each boring will be advanced approximately 3 ft into the indurated Chinle Formation (redbed).
- Care will be taken not to introduce contamination to the well, i.e., all tools will be decontaminated prior to drilling the borehole.
- Each well will be constructed with 4-in inside diameter (ID) Schedule 40 (SCH 40) polyvinylchloride (PVC) flush-joint casing equipped with a threaded end cap.
- The well casing will extend from the bottom of the borehole to at least 3 ft above ground surface.
- The well casing will be constructed with a 10-ft length of 0.010-in slotted well screen. The well screen will be positioned with the lowermost portion extending approximately 3 ft below the detected upper redbed surface and the upper portion extending approximately 7 ft into the overlying alluvium. Casing centralizers will be placed at the top and bottom of the screened interval as shown on **Figure 4**.
- The remaining well casing will be constructed with solid 4-in ID SCH 40 PVC flush-joint casing equipped with a venting cap.
- The annular space from the bottom of the borehole to 2 ft above the top of the well screen will be packed with 10-20 grade silica sand.
- A minimum of 1 ft of the annular space above the upper surface of the silica sand will be sealed with hydrated granular bentonite or bentonite chips.
- The annular space above the bentonite seal to 3 ft below ground surface will be sealed with bentonite-cement grout (minimum 2% - 5% bentonite).
- The upper 3 ft of the annular space will be filled with concrete to anchor a steel protective shroud.
- The steel protective shroud shall be minimum 6-inch ID, and will be equipped with a 2-piece cast locking protective cover. The locking protective cover shall be positioned a minimum of 6 in from the top of the PVC well casing to allow for easy access for removal of the PVC vent cap.
- A 4-ft x 4-ft x 6-in-thick concrete pad will be poured around the steel protective shroud. The pad will be radially sloped away from the well to promote stormwater drainage away from the well; and will be protected on each corner by a steel, concrete-filled bollard.
- The top of PVC casing, top of steel shroud, and top of concrete pad of the new monitoring well will be surveyed, referenced to a standard horizontal grid and elevations relative to the site control; and will be subsequently mapped by a licensed surveyor. The location of the well will be determined to within one-tenth of a foot, and the height above sea level at the top of the casing will be determined to within one-hundredth of a foot.
- Well completion data; NMOSE drilling permits and well records; and survey location information will be submitted to OCD in a "Well Completion Report".



TYPICAL VADOSE ZONE MONITORING WELL

NOT TO SCALE

LEGEND

CASING: 4" DIA. SCH 40 PVC

SCREEN: 4" DIA. 0.010" MACHINE SLOT SCH 40 PVC

PERVIOUS BACKFILL: 10-20 COLORADO® SILICA SAND OR EQUIVALENT

ANNULAR SEAL: NEAT CEMENT WITH 2% TO 5% BENTONITE

NOTE:

SPECIFIC VERTICAL DIMENSIONS FOR EACH NEW WELL WILL BE INCLUDED IN OSE AND OCD SUBMITTALS.

Drawing:P:\acad 2003\530.05.01\PERMIT FIGURES\2016-Draft 2 (Draft 1 OCD Comments)\UPDATED VADOSE MW.dwg
Date/Time:May. 27, 2016-08:16:21

VADOSE ZONE MONITORING WELL CONSTRUCTION DETAIL

SUNDANCE SERVICES, INC.
SURFACE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 05/26/2016	CAD: VADOSE MW .dwg	PROJECT #: 530.05.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE 4
APPROVED BY: IKG	gel@gordonenvironmental.com	

3.0 VADOSE ZONE MONITORING PROGRAM

Evidence of fluids in the VZs should not necessarily be attributed to impacts from the Landfill; and the fluid's origin must be interpreted correctly. For example, reconfiguration of Facility stormwater controls may alter surface water recharge to the subsurface, eliminating the source water. In addition, it is possible that some liquids may accumulate in a monitoring well from condensation within the well casing. The following sections describe the planned monitoring protocol for the SSI Facility vadose zone monitoring network.

3.1 Monitoring Schedule

The proposed vadose zone monitoring program will initially include inspection of each well for the presence of fluid. After the initial inspection, each VZ will be monitored for the presence of free liquids on an annual basis as required by 19.15.36.18.D (3)(b) NMAC.

3.2 Monitoring Assessment

Monitoring for the presence of liquid will be performed by lowering a calibrated electronic tape (i.e., water level indicator) that emits an audible signal when a water surface is penetrated. Total well depth measurements will also be recorded with the same electronic tape. **Appendix A** to this Plan is a typical field information form that may be used for routine vadose zone monitoring purposes.

If the water level indicator shows that free liquids are present in the well casing, an attempt will be made to evacuate the liquid to investigate its origin by lowering a 2-in PVC or Teflon bailer to remove the liquid from the well for sampling/testing purposes. A low flow or "micro-purge" technique may also be used in-lieu of the bailer. If a sufficient liquid sample cannot be retrieved, then the quantity of liquid in the well will be considered *de minimus*; and likely the result of condensation. The same procedures will be used to check for liquid and evacuate (as necessary or if possible) for each subsequent monitoring event.

If a sufficient quantity of liquid is available to allow sample collection, the liquid will be field-screened for specific conductance (SC), pH, and temperature (i.e., field parameters). In addition, initial sampling will include independent qualified commercial laboratory analysis for the parameters identified in **Table 2**. The initial field and laboratory data will be evaluated to determine if the water encountered is the result of surface water infiltration; or potential impacts

from the closed Landfills or Ponds. The data collected will be compared to regulatory groundwater standards established by the OCD and the Water Quality Control Commission (WQCC).

If the initial analyses indicate that no impact from the closed Landfills or Ponds is evident (based on a comparison to the regulatory groundwater standards previously identified), then routine monitoring of the available groundwater will continue on a semi-annual basis, as applicable for wells with a measurable (recoverable) water column. If subsequent monitoring indicates elevated readings (i.e., above the regulatory groundwater standards) relative to the initial analysis (i.e., greater than the OCD and WQCC standards), additional samples will be collected for laboratory analyses, and the data will be evaluated in accordance with the following Section to determine if a release from the closed Landfills or Ponds is possible.

3.3 Monitoring Data Evaluation

If the groundwater analysis indicates that a groundwater sample exceeds the regulatory groundwater standards, OCD will be notified within 48 hours and well verification re-sampling (VRS) for the parameters listed in **Table 2** will be conducted within 2-weeks. If the VRS analytical results indicate that a potential release may have occurred, the SSI Facility will provide notification of the discovery to the OCD Hobbs district office following the release notification procedures outlined in 19.15.29 NMAC.

Within 60-days of the receipt of notice from the OCD that an Abatement Plan is required, the SSI Facility will submit an Abatement Plan Proposal (in accordance with 19.15.30.13) detailing the proposed course of action to investigate further the potential release; and/or complete any mitigation measures as appropriate.

If this further evaluation indicate that the release is contained and no impacts have occurred, the monitoring data will be maintained as part of the Facility Operating Record, and submitted with annual vadose zone monitoring data for the Facility.

TABLE 2
Vadose Zone Monitoring Parameters
Sundance Services, Inc.

Field Parameters
- Specific Conductance
- pH
- Total Well Depth
- Temperature
- Depth to Water

Major Cations
- Calcium
- Magnesium
- Sodium
- Iron
- Potassium

Major Anions
- Fluoride
- Nitrate as N
- Sulfate
- Chloride
- Phosphorous

RCRA Metals
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Silver

Organic Compounds
- Benzene
- Toluene
- Ethylbenzene
- Xylenes

Additional Parameters
- Total Dissolved Solids (TDS)
- Total Petroleum Hydrocarbons (TPH)

SUNDANCE SERVICES, INC.

VADOSE ZONE MONITORING PLAN

APPENDIX A

VADOSE ZONE MONITORING FORM

(TYPICAL)

APPENDIX A

Vadose Zone Monitoring Form (Typical)

Sundance Services, Inc.

Monitoring Personnel _____

Weather Information

Date and Amount of Last Precipitation: _____

Temp: _____ °F

Wind Speed: _____ mph

Wind Direction: _____

Barometric Pressure: _____ inches mercury (Hg)

Weather Conditions: _____

Equipment Information

Monitoring Equipment Used: _____

Date and Time Last Calibrated: _____

Monitoring Equipment Used: _____

Date and Time Last Calibrated: _____

Well I.D.	Monitoring Date (dd/mm/yy)	Total Well Depth (fbtoc)	Depth to Water (fbtoc)	Field Parameter Measurement			Water Volume Removed (gallons)	Sample Collected?		Observations (e.g., color, odor, clarity, etc.)
				Temperature (°C)	pH (standard units)	Specific Conductance (mS/cm)		Y	N	
VZ-1										
VZ-2										
VZ-3										
VZ-4										
VZ-5										

Notes:

- *fmsl: feet above mean sea level*
- *fbtoc: feet below top of PVC casing*

Lea County Assessor Report on ownership of land tract

Lea County

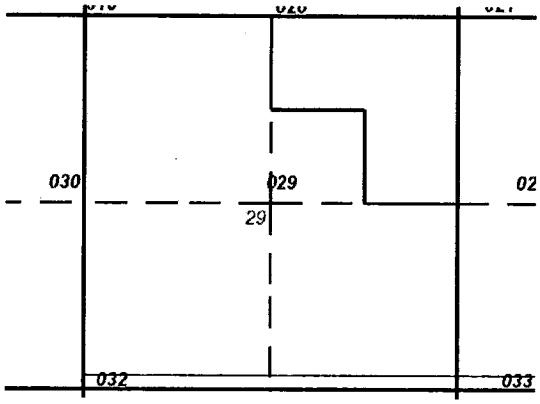
GIS INTERNET REPORT

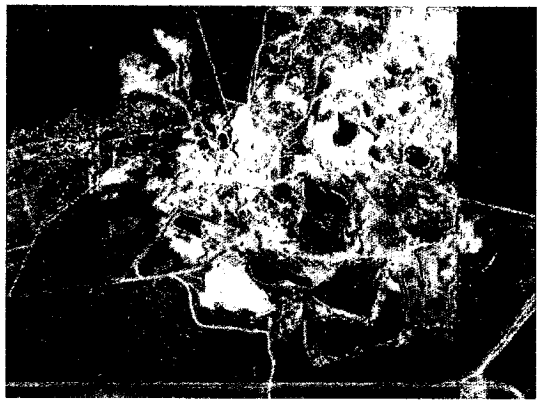
Assessment Information

OWNER NUMBER: 50319

PARCEL NUMBER: 4000503190005

UPC CODE: 4000503190005





Owner Information	
Owner:	WALLACH RANCH LLC
Mailing Address:	PO BOX 51707 MIDLAND TX 79710
Property Address:	

Subdivision Information	
Name:	
Unit:	
Block	
Lot:	

Legal Information
520.00 AC LOC W2, SE4, SW4NE4

2017 SEP 14 PM 3 29

STATE OF NEW MEXICO
OFFICE OF THE
ROSWELL, NEW MEXICO

Lea County, New Mexico Disclaimer

Lea County

GIS INTERNET REPORT

Other Information			
Taxable Value:	$15,317.00	Deed Book:	248
Exempt Value:	$0.00	Deed Page:	50
Net Value	$15,317.00	District:	080
Livestock Value:	$0.00	Section:	29
Manufactured Home Value:	$0.00	Township:	21
Personal Property:	$0.00	Range:	38
Land Value:	$44,079.00	Date Filed:	
Improvement Value:	$1,872.00	Most Current Tax:	$518.43
Full Value:	$45,951.00	Year Recorded:	

Square Foot and Year Built listed only to be used for comparative purposes, NOT to be used for commerce.

GORDON ENVIRONMENTAL PSC

213 S. Camino del Pueblo
Bernalillo, New Mexico 87004
505.867.6990

September 13, 2017

Ms. Catherine Goetz
Hydrogeologist
New Mexico Office of the State Engineer
Water Rights District II
1900 West Second Street
Roswell, NM 88201

RE: APPLICATION FOR ENVIRONMENTAL MONITORING WELLS, LEA COUNTY

Dear Ms. Goetz:

Thank you very much for your time and effort to discuss submittal requirements for permitting shallow monitoring wells at the Sundance Services Inc. oilfield waste disposal site in southeastern Lea County. Per our discussion, I am transmitting completed NMOSE forms WR-07 and WD-08 for permitting six new monitoring wells at the facility, which is being closed under a closure plan administered by the New Mexico Oil Conservation Division (NMOCD). As such, the closure plan includes details of commitments for monitoring well placement, completion and monitoring schedules and analytes. Attached is a copy of those portions of the plan pertaining to wells and monitoring. Also attached is a copy of a Lea County assessor's report on the facility property identifying the property owner.

The approved monitoring wells will be dry vadose zone monitoring wells and will be screened across the basal alluvium and bedrock shale interface and positioned in locations down-slope on the shale bedrock interface from the disposal facility. It is anticipated that the wells will be dry; however any wells penetrating shallow saturation, or having saturation appear during the closure care period (30 years) will be monitored as groundwater monitoring wells in accordance with a schedule and analyte suite set forth in the closure plan.

I appreciate your effort to process this application. We would like to obtain permits to drill the monitoring wells as soon as possible. If you have any questions or comments, please do not hesitate to contact me. Thanks again for your effort on this.

Sincerely,
GORDON ENVIRONMENTAL/PSC

Clay Kilmer, P.G.
Senior Hydrogeologist

Attachments: Completed (2) NMOSE Forms WR-07; Application for permit to drill 6 wells with no water right
Completed NMOSE Form WD-08; Well Plugging Plan
New Mexico Oil Conservation Division Site Closure Plan (Post-closure monitoring portion)
Lea County Assessor Report on ownership of land tract

cc: Charles Fiedler, Practice Leader, Gordon-PSC

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL

17-1A Depth of the well shall not exceed the thickness of the valley fill.

17-4 No water shall be appropriated and beneficially used under this permit.

17-6 The well authorized by this permit shall be plugged completely using the following method per Rules and Regulations Governing Well Driller Licensing, Construction, Repair and Plugging of Wells; Subsection C of 19.27.4.30 NMAC unless an alternative plugging method is proposed by the well owner and approved by the State Engineer upon completion of the permitted use. All pumping appurtenance shall be removed from the well prior to plugging. To plug a well, the entire well shall be filled from the bottom upwards to ground surface using a tremie pipe. The bottom of the tremie shall remain submerged in the sealant throughout the entire sealing process; other placement methods may be acceptable and approved by the state engineer. The well shall be plugged with an office of the state engineer approved sealant for use in the plugging of non-artesian wells. The well driller shall cut the casing off at least four (4) feet below ground surface and fill the open hole with at least two vertical feet of approved sealant. The driller must fill or cover any open annulus with sealant. Once the sealant has cured, the well driller or well owner may cover the seal with soil. A Plugging Report for said well shall be filed with the Office of the State Engineer in a District Office within 30 days of completion of the plugging, but no later than 09/30/2018.

17-7 The Permittee shall utilize the highest and best technology available to ensure conservation of water to the maximum extent practical.

Trn Desc: CP 01692 POD1-6 File Number: CP 01692
Trn Number: 614132

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

17-B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with 72-12-12 NMSA 1978. A licensed driller shall not be required for the construction of a well driven without the use of a drill rig, provided that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter.

17-C The well driller must file the well record with the State Engineer and the applicant within 30 days after the well is drilled or driven. It is the well owner's responsibility to ensure that the well driller files the well record.
The well driller may obtain the well record form from any District Office or the Office of the State Engineer website.

17-C2 No water shall be diverted from this well except for testing purposes which shall not exceed ten (10) cumulative days, and well shall be plugged or capped on or before , unless a permit to use water from this well is acquired from the Office of the State Engineer.

17-P The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between hydrogeologic zones.

17-Q The State Engineer retains jurisdiction over this permit.

17-R Pursuant to section 72-8-1 NMSA 1978, the permittee shall allow the State Engineer and OSE representatives entry upon private property for the performance of their respective duties, including access to the ditch or acequia to measure flow and also to the well for meter reading and water level measurement.

Trn Desc: CP 01692 POD1-6

File Number: CP 01692
Trn Number: 614132

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

LOG The Point of Diversion CP 01692 POD1 must be completed and the Well Log filed on or before 09/30/2018.

LOG The Point of Diversion CP 01692 POD2 must be completed and the Well Log filed on or before 09/30/2018.

LOG The Point of Diversion CP 01692 POD3 must be completed and the Well Log filed on or before 09/30/2018.

LOG The Point of Diversion CP 01692 POD4 must be completed and the Well Log filed on or before 09/30/2018.

LOG The Point of Diversion CP 01692 POD5 must be completed and the Well Log filed on or before 09/30/2018.

LOG The Point of Diversion CP 01692 POD6 must be completed and the Well Log filed on or before 09/30/2018.

IT IS THE PERMITTEES RESPONSIBILITY TO OBTAIN ALL AUTHORIZATIONS AND PERMISSIONS TO DRILL ON PROPERTY OF OTHER OWNERSHIP BEFORE COMMENCING ACTIVITIES UNDER THIS PERMIT.

SHOULD THE PERMITTEE CHANGE THE PURPOSE OF USE TO OTHER THAN MONITORING PURPOSES, AN APPLICATION SHALL BE ACQUIRED FROM THE OFFICE OF THE STATE ENGINEER.

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 09/14/2017 Pub. of Notice Ordered:
Date Returned - Correction: Affidavit of Pub. Filed:

This application is approved provided it is not exercised to the detriment of any others having existing rights, and is not contrary to the conservation of water in New Mexico nor detrimental to the public welfare of the state; and further subject to the specific conditions listed previously.

Witness my hand and seal this 27 day of Sep A.D., 2017

Tom Blaine, P.E., State Engineer

By: _____
Juan Hernandez

Trn Desc: CP 01692 POD1-6 File Number: CP 01692
Trn Number: 614132

Coordinates

UTM - NAD 83 (m) - Zone 13

Easting 681042.369

Northing 3591366.760

State Plane - NAD 83 (f) - Zone E

Easting 929801.582

Northing 527819.474

Degrees Minutes Seconds

Latitude 32 : 26 : 41.100000

Longitude -103 : 4 : 26.800000

NEW MEXICO OFFICE OF THE STATE ENGINEER

1:4,514

ft

0 90 180 360

Image Info

Source: USDA FSA

Date: 10/4/2016

Resolution (m):1

Accuracy (m): 6

Spatial Information

County: Lea

Groundwater Basin: Capitan

Sub-Basin:

Land Grant: Not in Land Grant

Restrictions:

NA

PLSS Description

SENESESE Quarter of Section 29, Township 021S, Range 038E

Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

Selected POD

GIS WATERS PODs

- ACT
- PEN

OSE District Boundary

POD Information

Owner: LEASEE-SUNDANCE SERV

File Number: CP-1692 POD1

POD Status: NoData

Permit Status: NoData

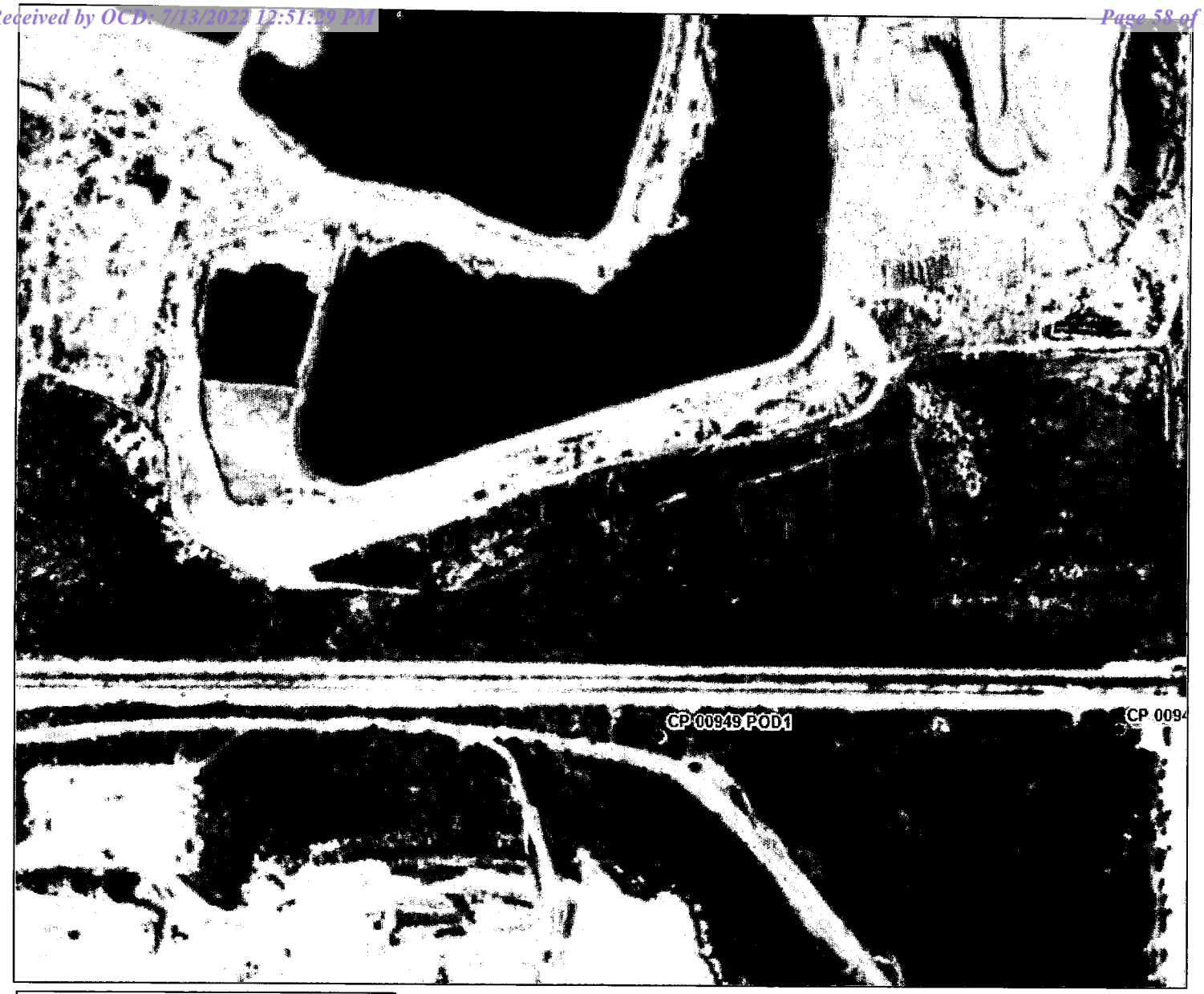
Permit Use: NoData

Purpose: MONITOR-VZ-2

YMENDIOLA 9/27/2017

Office of the State Engineer

Interstate Stream Commission



Coordinates

UTM - NAD 83 (m) - Zone 13
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Northing 3591261.660

State Plane - NAD 83 (f) - Zone E
Easting 928614.177
Northing 527482.042

Degrees Minutes Seconds
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Longitude -103 : 4 : 40.700000

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Image Info
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Date: 10/4/2016
Resolution (m):1
Accuracy (m): 6

Spatial Information

County: Lea
Groundwater Basin: Capitan
Sub-Basin:
Land Grant: Not in Land Grant
Restrictions:
NA

PLSS Description
NWSWSESE Quarter of Section 29, Township 021S, Range 038E
Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

POD Information

Owner: LEASEE SUNDANCE SERV
File Number: CP-1692 POD2
POD Status: NoData
Permit Status: NoData
Permit Use: NoData
Purpose: MONITOR VZ-3

Selected POD

GIS WATERS PODs

- ACT

OSE District Boundary

YMENDIOLA 9/27/2017

Reasonable efforts have been made by the New Mexico Office of the State Engineer (OSE) to verify that these maps accurately represent the source data used in the preparation; however, a degree of error is unavoidable in all maps, and these maps may contain omissions and errors in scale, resolution, rectification, positional accuracy, development methodology, interpretation of source data, and other circumstances.
These maps are distributed "as is" without warranty of any kind.

Office of the State Engineer
Interstate Stream Commission

Coordinates

UTM - NAD 83 (m) - Zone 13
Easting 680428.347
Northing 3591226.303

State Plane - NAD 83 (f) - Zone E
Easting 927784.080
Northing 527371.216

Degrees Minutes Seconds
Latitude 32 : 26 : 36.900000
Longitude -103 : 4 : 50.400000

NEW MEXICO OFFICE OF THE STATE ENGINEER
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ft
0 90 180 360
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Image Info
Source: USDA FSA
Date: 10/4/2016
Resolution (m): 1
Accuracy (m): 6

Spatial Information

County: Lea
Groundwater Basin: Capitan
Sub-Basin:
Land Grant: Not in Land Grant
Restrictions:
NA

PLSS Description
SESWSWSE Quarter of Section 29, Township 021S, Range 038E
Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

POD Information

Owner: LEASEE SUNDANCE SERV
File Number: CP-1692 POD3
POD Status: NoData
Permit Status: NoData
Permit Use: NoData
Purpose: MONITOR VZ-4

Selected POD

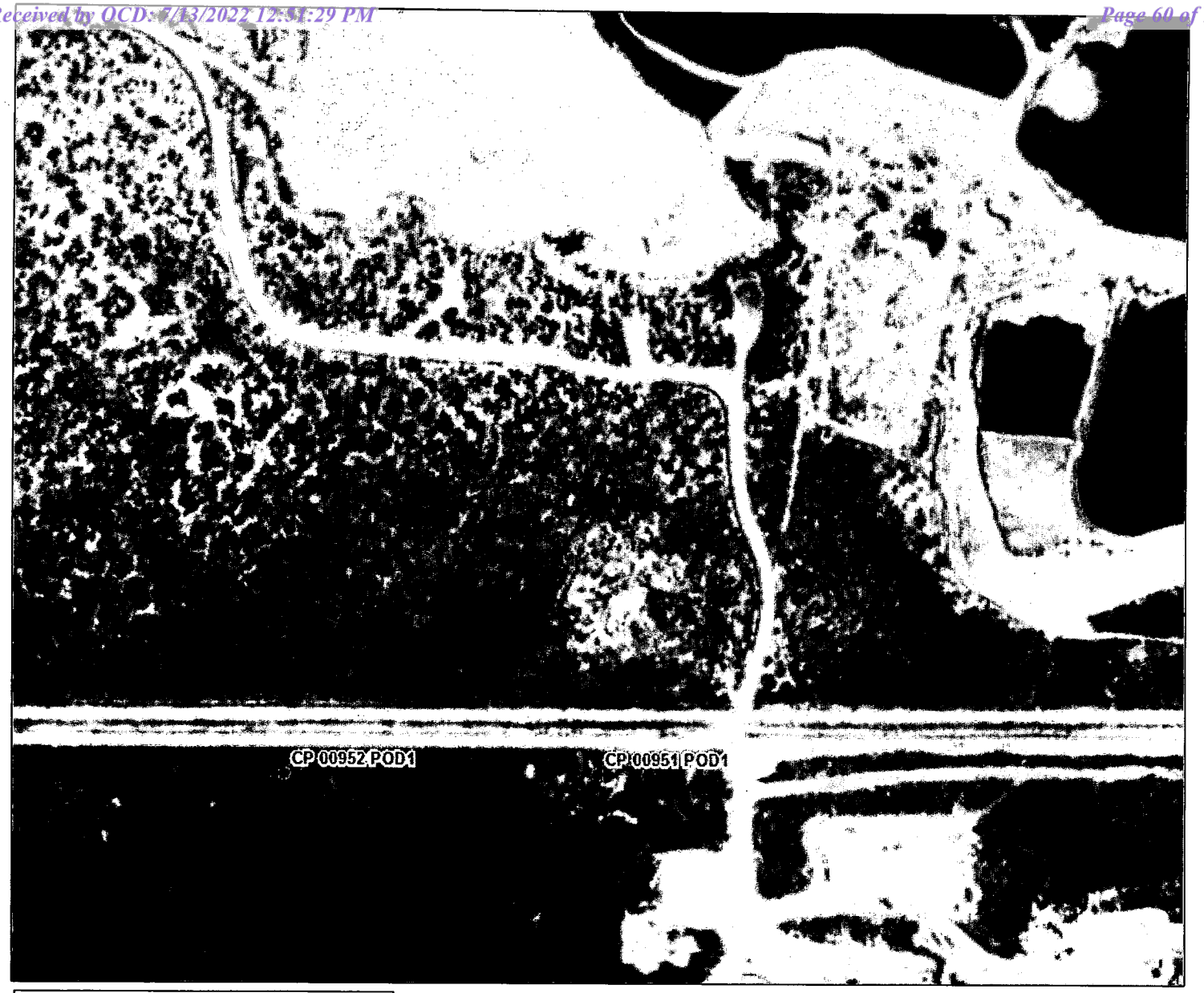
GIS WATERS PODs

ACT

OSE District Boundary

YMENDIOLA 9/27/2017

Office of the State Engineer
Interstate Stream Commission



Coordinates

UTM - NAD 83 (m) - Zone 13
Easting 680166.074
Northing 3591283.210

State Plane - NAD 83 (f) - Zone E
Easting 926924.721
Northing 527563.302

Degrees Minutes Seconds
Latitude 32 : 26 : 38.900000
Longitude -103 : 5 : 0.400000

NEW MEXICO OFFICE OF THE STATE ENGINEER
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ft
0 90 180 360
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Image Info
Source: USDA FSA
Date: 10/4/2016
Resolution (m): 1
Accuracy (m): 6

Spatial Information

County: Lea
Groundwater Basin: Capitan
Sub-Basin:
Land Grant: Not in Land Grant
Restrictions:
NA

PLSS Description
NESESESW Quarter of Section 29, Township 021S, Range 038E
Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

POD Information

Owner: LEASEE SUNDANCE SERV
File Number: CP-1692 POD4
POD Status: NoData
Permit Status: NoData
Permit Use: NoData
Purpose: MONITOR VZ-5

Selected POD

GIS WATERS PODs

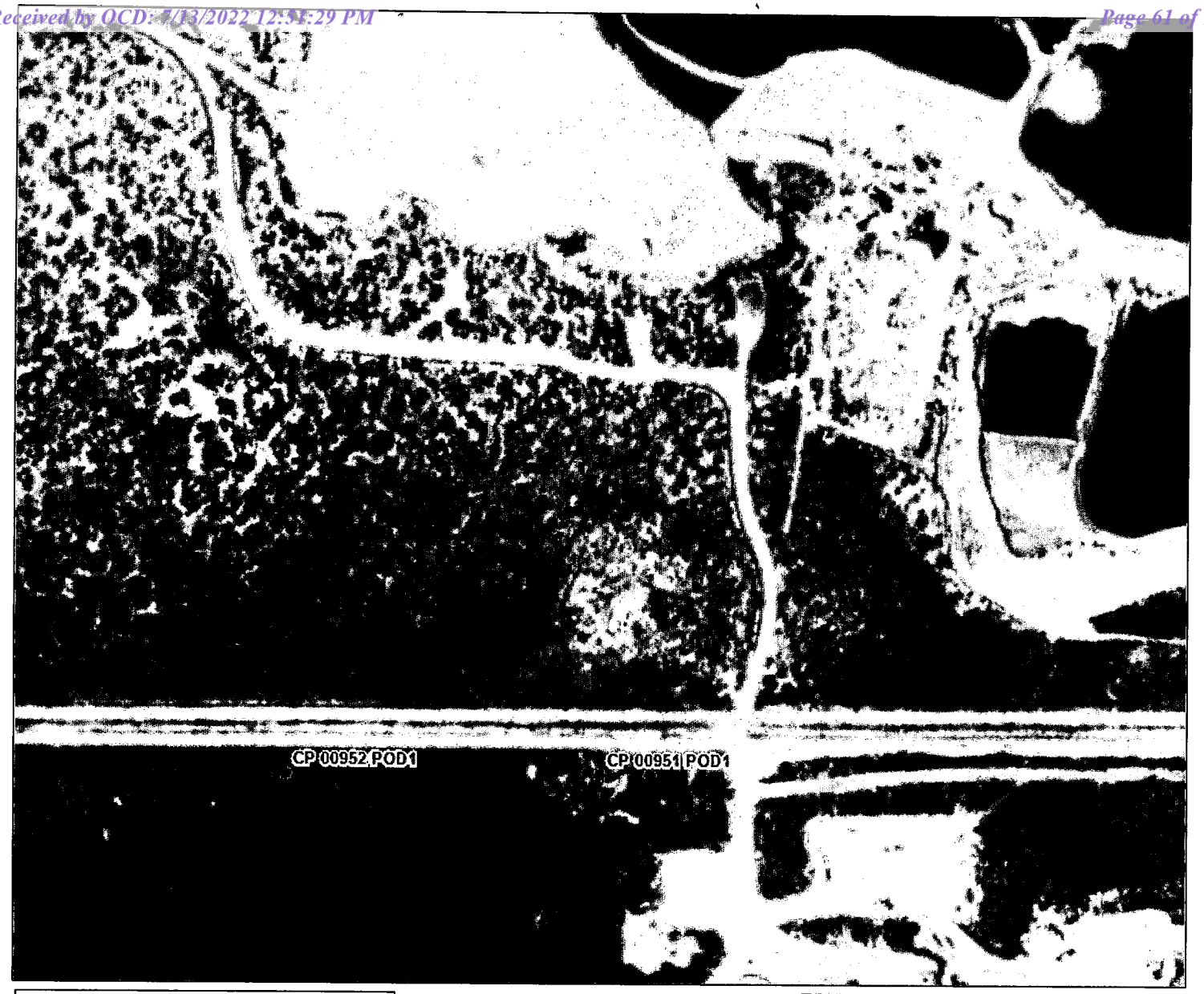
ACT

OSE District Boundary

YMENDIOLA 9/27/2017

Reasonable efforts have been made by the New Mexico Office of the State Engineer (OSE) to verify that these maps accurately portray the source data used in their preparation, however, a degree of error is inherent in all maps, and these maps may contain omissions and errors in scale, resolution, modification, positional accuracy, development methodology, interpretation of source data, and other circumstances.
These maps are distributed "as is" without warranty of any kind.

Office of the State Engineer
Interstate Stream Commission



Coordinates

UTM - NAD 83 (m) - Zone 13
Easting 680166.074
Northing 3591283.210

State Plane - NAD 83 (f) - Zone E
Easting 926924.721
Northing 527563.302

Degrees Minutes Seconds
Latitude 32 : 26 : 38.900000
Longitude -103 : 5 : 0.400000

NEW MEXICO OFFICE OF THE STATE ENGINEER
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ft
0 90 180 360
N

Image Info
Source: USDA FSA
Date: 10/4/2016
Resolution (m): 1
Accuracy (m): 6

Spatial Information
County: Lea
Groundwater Basin: Capitan
Sub-Basin:
Land Grant: Not in Land Grant
Restrictions:
NA
PLSS Description
NESESESW Quarter of Section 29, Township 021S, Range 038E
Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

POD Information
Owner: LEASEE SUNDANCE SERV
File Number: CP-1692 POD5
POD Status: NoData
Permit Status: NoData
Permit Use: NoData
Purpose: MONITOR VZ-6

Selected POD

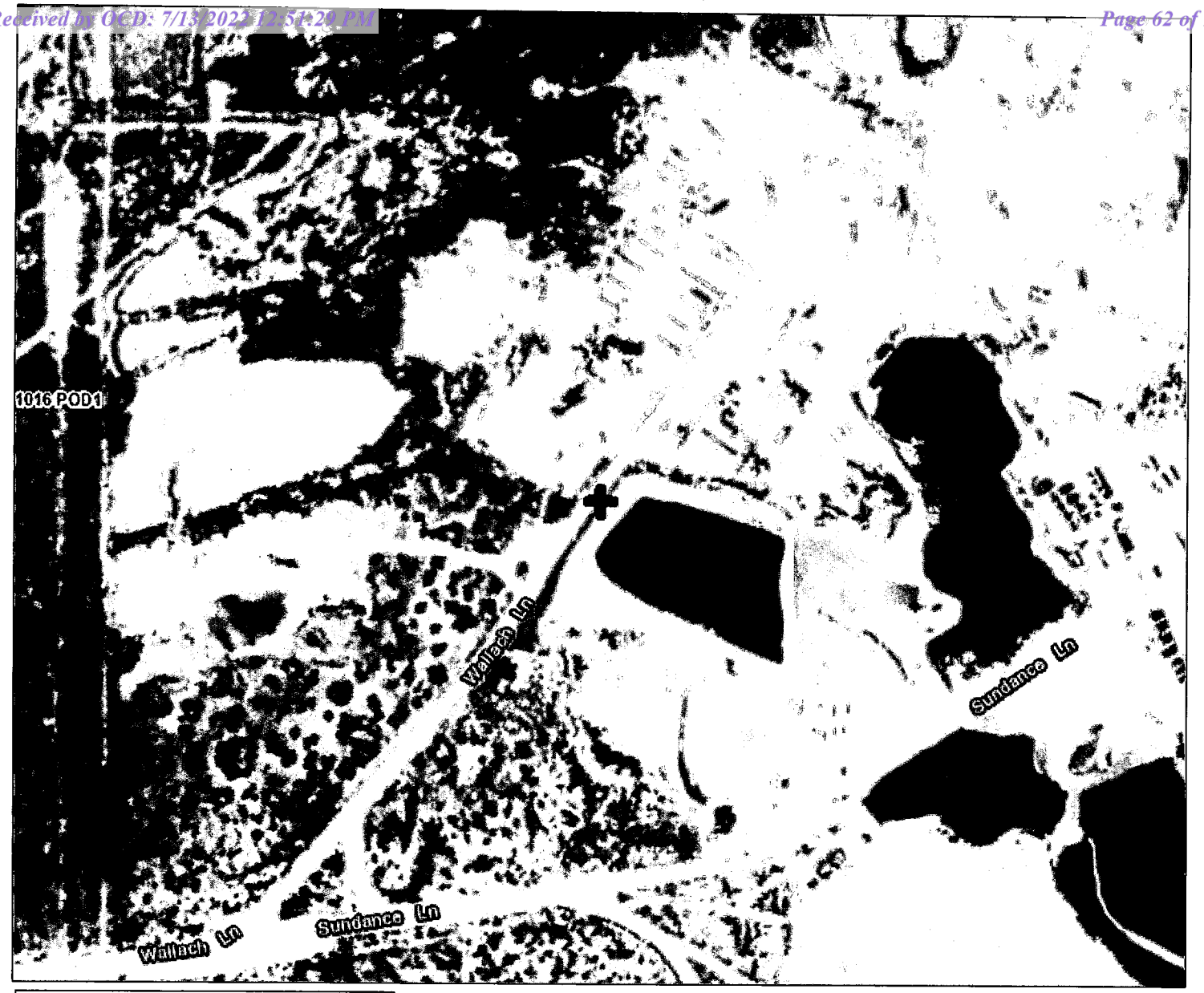
GIS WATERS PODs

- ACT

OSE District Boundary

YMENDIOLA 9/27/2017

Office of the State Engineer
Interstate Stream Commission



Coordinates

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State Plane - NAD 83 (f) - Zone E
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Northing 529461.091

Degrees Minutes Seconds
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ft
0 90 180 360
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Image Info
Source: USDA FSA
Date: 10/4/2016
Resolution (m):1
Accuracy (m): 6

Spatial Information

County: Lea
Groundwater Basin: Capitan
Sub-Basin:
Land Grant: Not in Land Grant
Restrictions:
NA

PLSS Description
NENENWSW Quarter of Section 29, Township 021S, Range 038E
Derived from CADNSDI- Qtr Sec. locations are calculated and are only approximations

POD Information

Owner: LEASEE SUNDANCE SERV
File Number: CP-1692 POD6
POD Status: NoData
Permit Status: NoData
Permit Use: NoData
Purpose: MONITOR VZ-7

Selected POD
OSE District Boundary

YMENDIOLA 9/27/2017

Office of the State Engineer
Interstate Stream Commission

OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION – ROSWELL OFFICE

OFFICIAL RECEIPT NUMBER: 2 - 38611 DATE: 9/14/17 FILE NO.: _____

TOTAL: 30.00 RECEIVED: Thirty dlls DOLLARS CHECK NO.: 11414 CASH: _____

PAYOR: Gordon Environmental, Inc ADDRESS: 2135. Camino del Pueblo CITY: Bernalillo STATE: NM

ZIP: 87004 RECEIVED BY: CGullen

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; and **yellow** copy for Water Rights. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of your daily deposit.

A. Ground Water Filing Fees

___	1. Change of Ownership of Water Right	$ 2.00
___	2. Application to Appropriate or Supplement Domestic 72-12-1 Well	$ 125.00
___	3. Application to Repair or Deepen 72-12-1 Well	$ 75.00
___	4. Application for Replacement 72-12-1 Well	$ 75.00
___	5. Application to Change Purpose of Use 72-12-1 Well	$ 75.00
___	6. Application for Stock Well/Temp. Use	$ 5.00
___	7. Application to Appropriate Irrigation, Municipal, or Commercial Use	$ 25.00
___	8. Declaration of Water Right	$ 1.00
___	9. Application for Supplemental Non 72-12-1 Well	$ 25.00
___	10. Application to Change Place or Purpose of Use Non 72-12-1 Well	$ 25.00
___	11. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Ground Water	$ 50.00
___	12. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Ground Water	$ 50.00
___	13. Application to Change Point of Diversion of Non 72-12-1 Well	$ 25.00
___	14. Application to Repair or Deepen Non 72-12-1 Well	$ 5.00
4	15. Application for Test, Expl. Observ. Well	$ 5.00
___	16. Application for Extension of Time	$ 25.00
___	17. Proof of Application to Beneficial Use	$ 25.00
___	18. Notice of Intent to Appropriate	$ 25.00

B. Surface Water Filing Fees

___	1. Change of Ownership of a Water Right	$ 5.00
___	2. Declaration of Water Right	$ 10.00
___	3. Amended Declaration	$ 25.00
___	4. Application to Change Point of Diversion and Place and/or Purpose of Use from Surface Water to Surface Water	$ 200.00
___	5. Application to Change Point of Diversion and Place and/or Purpose of Use from Ground Water to Surface Water	$ 200.00
___	6. Application to Change Point of Diversion	$ 100.00
___	7. Application to Change Place and/or Purpose of Use	$ 100.00
___	8. Application to Appropriate	$ 25.00
___	9. Notice of Intent to Appropriate	$ 25.00
___	10. Application for Extension of Time	$ 50.00
___	11. Supplemental Well to a Surface Right	$ 100.00
___	12. Return Flow Credit	$ 100.00
___	13. Proof of Completion of Works	$ 25.00
___	14. Proof of Application of Water to Beneficial Use	$ 25.00
___	15. Water Development Plan	$ 100.00
___	16. Declaration of Livestock Water Impoundment	$ 10.00
___	17. Application for Livestock Water Impoundment	$ 10.00

APPLICANT COPY

All fees are non-refundable.

C. Well Driller Fees

___	1. Application for Well Driller's License	$ 50.00
___	2. Application for Renewal of Well Driller's License	$ 50.00
___	3. Application to Amend Well Driller's License	$ 50.00

D. Reproduction of Documents

___ @ 0.25¢ $_____

___ Map(s) $_____

E. Certification $_____

F. Other $_____

G. Comments:

Mail –

ATTACHMENT B

DOCUMENTATION OF NM811 UNDERGROUND UTILITY CLEARANCE

Clay Kilmer

From: eticket@nm811.org
Sent: Thursday, October 19, 2017 7:38 AM
To: claykilmer@gmail.com
Subject: NM811 Ticket Confirmation: 17OC190058

NM811 LOCATE REQUEST

TICKET NUMBER:	17OC190058	Update of:	
Ticket Type:	Standard Locate	For Code:	AUTOEMAIL
Creation Date:	10/19/17 07:37	Seq Num:	1

Excavator Information

Company:	Gordon-PSC	Main Contact Phone:	(505) 235-4482
Address:	213 S Camino del Pueblo	Secondary Phone:	5058676990
City, St, Zip:	Bernalillo, NM 87004	Main Contact Email:	claykilmer@gmail.com
Company Phone:	(505) 867-6990	Alternate Contact:	Charles Fiedler
Company Fax:		Alternate Contact Phone:	(505) 867-6990
Main Contact:	Clay Kilmer	Alternate Contact Email:	cfiedler@team-psc.com

Work Information

State:	NM	Work To Begin:	10/23/17 AT 07:45
County:	LEA	Expire Date:	11/06/17 AT 07:45
Place:	RURAL LEA		
Address:	rural E rural not paved		
Intersection:	TAB		
Latitude:	32.442048	Longitude:	-103.089286
Secondary Lat:	32.451428	Secondary Long:	-103.072626
Work Type:	Bore-Auger - Holes	Working For:	Sundance Services LLC
Pre-marked:	No	Mechanical Boring:	No
Contact Prior to Locating:	No	Contact After Locating:	No

Driving Directions

Beginning at the intersection of NM 176 and NM 18: Drive north on NM 18 0.20 miles to the intersection of NM 18 and Wallach Lane; Turn right onto Wallach lane: Drive east on Wallach lane 2.15 miles to the intersection of Wallach Lane and Sundance Lane

Spotting Instructions

Sites to clear are 6 groundwater monitoring well drill sites . Each well site is marked with a stake and white flagging. Area of potential disturbance is a radius of 100 feet of each drill site GPS coordinates for the six well locations are: 32.44740N 103.074120W 32.443859N 103.077964W 32.443576N 103.080655W 32.444132N 103.083444W 32.445440N 103.085692W 32.449392N 103.086857W

Remarks

Open Access/Earthmoving equipment working in the area

TRSQ: [W8T21SR38ES28NW] [W8T21SR38ES29NW] [W8T21SR38ES29SE] [W8T21SR38ES29SW] [W8T21SR38ES32NE] [W8T21SR38ES32NW] [W8T21SR38ES33NW]

Utilities Notified:

Code	Name	Manually Added
COEUN	CITY OF EUNICE	False
TCO2	TRINITY PIPELINE GP LLC	False
WNDSTRM	WINDSTREAM COMMUNICATIONS	False
XCEH	XCEL- HOBBS SERVICE CENTER	False

Clay Kilmer

From: John Dittrich <jdittrich@cityofeunice.org>
Sent: Friday, October 20, 2017 8:33 AM
To: claykilmer@gmail.com
Subject: One call ending in 0058 is clear with city of Eunice

Sent from my Verizon, Samsung Galaxy Tablet

Clay Kilmer

From: Tracy Lambdin <TLambdin@trinityco2.com>
Sent: Thursday, October 19, 2017 8:19 AM
To: claykilmer@gmail.com; ,
Subject: NM one call 0058
Attachments: test wells pic.PNG

You are clear from Trinity CO2 PL. as per your driving directions and GPS.

Mr. Tracy Lambdin
Trinity CO2 Pipeline
432-640-7957

Excavation Site Clear Notification

To: Charles Fiedler 10/19/2017, 07:44 AM

Email: claykilmer@gmail.com

Below lists utilities that were statused by USIC as Excavation Site Clear.

Please note there may be other Utilities which include private facilities that may be present in the work area and are NOT the responsibility of USIC to locate or mark.

Follow all Federal, State, and Local Laws.

Ticket Number	Address
17OC190058	rural E rural not paved

Utility	Locate Date/Time	Ticket Status
Xcel Energy Electric - NM	10/19/2017, 07:44 AM	Excavation Site Clear

---

You are receiving this notification because your contact information is listed on the above ticket from the One Call System. If you have any questions regarding this notification, please contact USIC at 1-800-762-0592 or reply to this email TicketNotification@usicllc.com.

Positive Response

Date: **10/19/2017**
Time: **15:52:57**
To: **CLAY KILMER**
Company: **GORDON-PSC**
From: **UNIBAR DPG**
Subject: **Request for Underground Location**

This message is being sent in a response to your request for undeground utility location. The following represents a list of responses for the dedicated member codes. These reponses only pertain to the specific member codes.

==========

Ticket: **17190058** Address: RURAL E RURAL NOT RURAL LEA, NM

Company: WINDSTREAM NEW MEXICO CDC Code: WSCNM / WNDSTRM Status: Site Visit not in conflict at this time Completed: 10/19/2017 13:52:31 Response: No conflict in work area Notes:

NO CONFLICT AT THIS TIME

If there are any questions regarding this transmission or if you arrive at the site and have a question about the work site, please call 855-286-4227.

Olameter

Clay Kilmer

From: eticket@nm811.org
Sent: Thursday, November 9, 2017 8:56 AM
To: claykilmer@gmail.com
Subject: NM811 Ticket Confirmation: 17NV090154

NM811 LOCATE REQUEST

TICKET NUMBER:	17NV090154	Update of:	
Ticket Type:	Standard Locate	For Code:	AUTOEMAIL
Creation Date:	11/09/17 08:56	Seq Num:	1

Excavator Information

Company:	Gordon-PSC	Main Contact Phone:	(505) 235-4482
Address:	213 S Camino del Pueblo	Secondary Phone:	5058676990
City, St, Zip:	Bernalillo, NM 87004	Main Contact Email:	claykilmer@gmail.com
Company Phone:	(505) 867-6990	Alternate Contact:	Charles Fiedler
Company Fax:		Alternate Contact Phone:	(505) 867-6990
Main Contact:	Clay Kilmer	Alternate Contact Email:	cfiedler@team-psc.com

Work Information

State:	NM	Work To Begin:	11/13/17 AT 09:00
County:	LEA	Expire Date:	11/29/17 AT 09:00
Place:	RURAL LEA		
Address:	rural E rural not paved		
Intersection:	TAB		
Latitude:	32.442048	Longitude:	-103.089286
Secondary Lat:	32.451428	Secondary Long:	-103.072626
Work Type:	Bore-Auger - Holes	Working For:	Sundance Services LLC
Pre-marked:	No	Mechanical Boring:	No
Contact Prior to Locating:	No	Contact After Locating:	No

Driving Directions

Beginning at the intersection of NM 176 and NM 18: Drive north on NM 18 0.20 miles to the intersection of NM 18 and Wallach Lane; Turn right onto Wallach lane: Drive east on Wallach lane 2.15 miles to the intersection of Wallach Lane and Sundance Lane

Spotting Instructions

Sites to clear are 6 groundwater monitoring well drill sites . Each well site is marked with a stake and white flagging. Area of potential disturbance is a radius of 100 feet of each drill site GPS coordinates for the six well locations are: 32.44740N 103.074120W 32.443859N 103.077964W 32.443576N 103.080655W 32.444132N 103.083444W 32.445440N 103.085692W 32.449392N 103.086857W

Remarks

Open Access/Earthmoving equipment working in the area RELOCATE: ONGOING WORK

TRSQ: [W8T21SR38ES28NW] [W8T21SR38ES29NW] [W8T21SR38ES29SE] [W8T21SR38ES29SW] [W8T21SR38ES32NE] [W8T21SR38ES32NW] [W8T21SR38ES33NW]

Utilities Notified:

Code	Name	Manually Added
COEUN	CITY OF EUNICE	False
TCO2	TRINITY PIPELINE GP LLC	False
WNDSTRM	WINDSTREAM COMMUNICATIONS	False
XCEH	XCEL- HOBBS SERVICE CENTER	False

Clay Kilmer

From: John Dittrich <jdittrich@cityofeunice.org>
Sent: Tuesday, November 14, 2017 9:10 PM
To: claykilmer@gmail.com
Subject: One call ending in 0154 is clear with city of Eunice

Sent from my Verizon, Samsung Galaxy Tablet

Clay Kilmer

From: Tracy Lambdin <TLambdin@trinityco2.com>
Sent: Thursday, November 9, 2017 9:45 AM
To: claykilmer@gmail.com
Subject: NM one call 0154

You are clear from Trinity CO2 PL as per your driving directions and GPS.

Mr. Tracy Lambdin
Trinity CO2 Pipeline
432-640-7957

Clay Kilmer

From: windstreamprs@korweb.com
Sent: Thursday, November 9, 2017 5:35 PM
To: CLAYKILMER@GMAIL.COM
Subject: Ticket 17NV090154 for WNDSTRM - Status Change

Importance: High

Ticket 17NV090154 for WNDSTRM - Status Change

==========
Company: GORDON-PSC Email: CLAYKILMER@GMAIL.COM
==========
Ticket Number: 17NV090154
Work to Begin Date/Time: 11/13/2017 09:00:00 am
County: LEA
City: RURAL LEA
Address: RURAL E RURAL NOT PAVED
Contact: CLAY KILMER
Phone: 5052354482

Member Code Facility Last Completion Date/Time

WNDSTRM CUSTOM2 11/09/2017 05:29:11 pm
** PHONE: Excavation Site Clear,
Response: CLEARED IN FIELD **

If you have problems with this report please contact:
Locate Desk (800)289-1901
Notes:
Windstream has addressed your ticket as noted above. If you have any further questions please contact our Damage Prevention Groups at 1-800-289-1901.

ATTACHMENT C

LITHOLOGIC LOGS AND CONSTRUCTION DETAILS, VADOSE ZONE WELLS

Gordon Environmental, Inc.
Consulting Engineers

Log of Borehole No.: PGI–8 | Well VZ-1 CP-1014 | Total Depth 28.5' | FIGURE 9 OF 9 | File No.: 530.01.01/03

Client: SUNDANCE SERVICES INC.

Water Level Data	Location COORDS's and Elevation (NAVD88)	Borehole Information		
24' Ft. While Drilling (below ground surface)	N: 529190.50	Date Started: 4/12/2009	Drilling Co.: RODGERS & CO.	GEI Rep.: LMC
24.44 Ft. at completion (below ground surface)	E: 929926.45	Date Comp: 4/12/2009	Driller: JOHN	Drill Meth.: 0–27' HSA, 27'–28.5' SS
water level data approximate	Elevation: 3457.86	Location: SUNDANCE SERVICES EAST PGI SITE	Helper: JUAN	Sampling Meth.: SPLIT SPOON
	MODIFIED GROUND COORDINATES			

Depth (ft. BGS)	Graphic Lithology	Soil/Lithology Description	Elevation (ft.)	
			3457.86	
		Fill: fine sand; variable gravel and silt; mixed caliche; dry to s. moist		
16'		Sand: silty v. fine to fine; reddish yellow to med. tan; moist		Gravel to 2" dia @ 19'
24.44			3433.42	Saturated @ 24' bgs
27'		Claystone; red; dry	3430.86	Chinle redbeds
28.5'				

KEY

WATER LEVEL AFTER COMPLETION

WATER ENCOUNTERED DURING DRILLING

SURVEYED COORDINATES (5-2009)

BOREHOLE		NORTHING	EASTING	ELEVATION
PGI-8	RIM	529190.77	929926.35	3460.60
	CASING	529190.50	929926.45	3460.00
	CONCRETE	529191.18	929926.36	3457.86

HSA = HOLLOW STEM AUGER

SS = SPLIT SPOON

Drawing:P:\acad 2003\530.01.01\FIGURES\BORING LITH LOGS PGI 1-8.dwg
Date/Time:Jul. 08, 2009-11:08:36

GORDON ENVIRONMENTAL PSC
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-2** CP-1692-POD-1

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84)	32°, 26', 41.2" N, 103°, 04', 26.7" W	**Drilled Depth:**	35 ft
L.S. Elevation (feet):		**Cased Depth:**	35 ft
Drill Date	11/17/17	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer		
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0	Blank well casing -2" PVC Sch 40 FJ 25.0 ft below land surface to 3 ft above grade	Concrete 2 ft - 0 ft	Soil, sandy loam, 80% sand, 20% fines, yellowish red, 5YR4/6, dry, loose, non plastic	SM		
			Sand, carbonate-bound (caliche), 60% sand, 40% fines, light brown, 10YR8/3, dry very hard, non plastic	SM	0-5 50%	1
5			Gravelly in interval 7-9 ft	SP	5-10 20%	2
10		Annular grout seal Portland Type I-II 5% bentonite 21.0 ft - 2.0 ft			10-15 30%	3
15			Sand, as above, color trending to reddish yellow	SM		
			Sand, silty, gravelly, 70% sand, 25% fines, 5% gravel , yellowish red 5YR4/6, dry, hard, low plasticity	SP	15-20 50%	4
20		1/4-in bentonite pellet - hydrated 23.0 ft - 21.0 ft	Silt, clayey, sandy, gravelly, 70% fines, 28% sand, 2% gravel, redddish brown, redbed detritus, dry hard, medium plasticity	ML		
			Silt, sandy, 70% fines, 30% sand, greenish grey, grading to sand, fine, silty, friable, dry, hard, non plastic	ML	20-25 70%	5
25	2-inch Sch 40 PVC screen 0.010 slot 35.0 ft - 25.0 ft	20/40 Colorado Silica Sand 35.0 ft - 23.0 ft			25-30 10%	6
30			Shale, siltstone, sandy, maroon, interbedded sandy zones, clayey zones, dry, hard, non plastic	bedrock		
					30-35 90%	7
35			**Total Depth Drilled: 35 ft** Well dry on completion			
40						
45						
50						
55						
60						

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Bernalillo, New Mexico, USA
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Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-3** CP-1692-POD-2

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84)	32°, 26', 37.4" N, 103°, 04', 40.6" W	**Drilled Depth:**	60 ft
L.S. Elevation (feet):		**Cased Depth:**	60 ft
Drill Date	11/16/17	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer		
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0		Concrete 2 ft - 0 ft	Soil, sandy loam, 85% sand, 15% fines, yellowish red, 5YR4/6, slightly moist, loose, non plastic	SM	0-5 70%	10
5			Sand, silty, gravelly, cabonate bound (caliche), 60% sand, 25% fines, 15%gravel, light brown, 10YR8/3 moist, soft, low plasticity	SM	5-10 50%	11
			Sand, silty, caliche laminae, 80% sand, 20% fines, light brown, 10YR8/3, slightly moist, firm, medium plasticity	SM		
10					10-15 30%	12
			Sand, silty, gravelly, carbonate bound (caliche), 75% sand, 15% fines, 10% gravel, light brown, 10YR8/3, moist, firm, medium plasticity	SM		
15					15-20 85%	13
			Sand, silty, gravelly, carbonate bound (caliche), 80% sand, 15% fines, 5% gravel, pinkish brown slightly moist, firm, low plasticity	SM		
20	Blank well casing -2" PVC Sch 40 FJ 46.0 ft below land surface to 3 ft. above grade	Annular grout seal Portland Type I-II 5% bentonite 46.0 ft - 2.0 ft			20-25 30%	14
25			Sand, silty, gravelly, 75% sand, 20% fines, 5% gravel, redbed clasts, reddish brown, 10YR3/6 moist, firm, low plasticity	SM	25-30 65%	15
30			Marl, sandy silt, 50% sand, 50% fines, greenish grey, 5G6/1, slightly moist, hard, low plasticity	ML	30-35 85%	16
35			Sandstone, fine grained, silty, fissile (muscovite partings), olive grey, moist, hard, non plastic	sandstone bedrock	35-40 20%	17
40			Very moist at 40 ft			
			Sandstone, as above		40-45 50%	18
45		1/4-in bentonite pellet - hydrated 48.0 ft - 46.0 ft		sandstone		
			Sandstone, as above		45-50 40%	19
50	2-inch Sch 40 PVC screen 0.010 slot 60.0 ft - 50.0 ft		Sandstone, as above, color darker olive grey			
			Sandstone, as above		50-55 40%	20
55		20/40 Colorado Silica Sand 60.0 ft - 48.0 ft				
					55-60 65%	21
60			Total Depth Drilled: 60 ft Dry upon completion	sandstone		

GORDON ENVIRONMENTAL PSC
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-4** CP-1692-POD-3

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84):	32°, 26', 36.0" N, 103°, 04', 50.9" W	**Drilled Depth:**	25 ft
L.S. Elevation (feet):		**Cased Depth:**	25 ft
Drill Date	11/15/174	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**Water Level -- Date:**	
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0	Blank well casing - 2" PVC Sch 40 FJ 15.0 ft below land surface to 3 ft above grade	Concrete 2 ft - 0 ft	Soil, sandy loam, 80% sand,20% fines, yellowish red, 5YR4/6, slightly moist, loose, non plastic	SM	0-5	23
5		Annular grout seal Portland Type I-II 5% bentonite 11.0 ft - 2.0 ft	Sand, silty, 80% sand,20% fines, yellowish red, 5YR4/6, slightly moist, loose, non plastic	SM	5-10	24
10		1/4-in bentonite pellet - hydrated 13.0 ft - 11.0 ft	Sand, silty, 70% sand, 30% fines, light yellowish red, very moist, loose, low plasticity	SM	10-15	25
WL: 15 ft ▽ 15	2-inch Sch 40 PVC screen 0.010 slot 25.0 ft - 15.0 ft	20/40 Colorado Silica Sand 25.0 ft - 13.0 ft	Sand, silty, 65% sand, 35% fines, light yellowish red, saturated, soft, low plasticity	SM	15-20	26
20			Shale, 100% fines (clay), bright red, hard, high plasticity	Shale bedrock	20-25	27
25			TD Drilled: 25 ft			
30						
35						
40						
45						
50						
55						
60						

GORDON ENVIRONMENTAL PSC
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-5** CP-1692-POD-4

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84):	32°, 26', 38.9" N, 103°, 05', 0.3" W	**Drilled Depth:**	30 ft
L.S. Elevation (feet):		**Cased Depth:**	30 ft
Drill Date	11/15/17	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer		
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0	Blank well casing -2" PVC Sch 40 FJ 20.0 ft below land surface to 3 ft above grade	Concrete 2 ft - 0 ft	Soil, sandy loam, 90% sand,10% fines, yellowish red, 5YR4/6, dry, loose, non plastic	SW	0-5 60%	28
5		Annular grout seal Portland Type I-II 5% bentonite 16.0 ft - 2.0 ft	Sand, silty, 70% sand, 30% fines, lime bound (caliche), light brown, 10YR8/3, dry, firm, non plastic	SM	5-10 20%	28
10					10-15 10%	29
15		1/4-in bentonite pellet - hydrated 18.0 ft - 16.0 ft	Sand, silty, 65% sand, 35% fines, orange-buff, firm, friable, slightly moist, low plasticity	SM	15-20 5%	30
20	2-inch Sch 40 PVC screen 0.010 slot 30.0 ft - 20.0 ft	20/40 Colorado Silica Sand 30.0 ft - 18.0 ft	Gravel, silty, sandy, 55% gravel, 25% sand, 29% fines, orange-buff, slightly moist, firm, low plasticity	GC		
25			Sand, silty, gravelly, 60% sand, 35% fines, 5% gravel, orange, firm, slightly moist, low plasticity	GC	20-25 15%	31
30			Shale bedrock, 100% fines, bright red, hard, high plasticity	Shale bedrock	25-30 70%	32
35			TD Drilled: 30 ft Dry upon completion			
40						
45						
50						
55						
60						

GORDON ENVIRONMENTAL PSC
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-6** CP-1692-POD-5

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84):	32°, 26', 43.6" N, 103°, 05', 7.8" W	**Drilled Depth:**	23 ft
L.S. Elevation (feet):		**Cased Depth:**	23 ft
Drill Date	11/15/17	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer		
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0	Blank well casing -2" PVC Sch 40 FJ 15.0 ft below land surface to 3 ft above grade	Concrete 2 ft - 0 ft	Soil, sandy loam, 85% sand,15% fines, yellowish red, 5YR4/6, dry, loose, non plastic	SW	0-5	34
5		Annular grout seal Portland Type I-II 5% bentonite 9.0 ft - 2.0 ft	Sand, silty, 80% sand, 20% fines, lime bound (caliche), light brown, 10YR8/3, dry, firm, non plastic	SP	5-10	35
10		1/4-in bentonite pellet - hydrated 11.0 ft - 9.0 ft	Sand, gravelly, 70% sand, 20% gravel (up to 1", rounded, quartzite), 10% fines, lime bound (caliche) reddish grey, hard, slightly moist, non plastic	GP	10-15	36
15	2-inch Sch 40 PVC screen 0.010 slot 23.0 ft - 13.0 ft	20/40 Colorado Silica Sand 23.0 ft - 11.0 ft	Gravel, sandy 80% gravel, 20% sand, pinkish grey, firm, slightly moist, non plastic	GP	15-20	37
20			Silt, carbonaceous, (marl), light grey N7, very firm, slightly moist, low plasticity	MH		
			Shale bedrock, 100% fines, bright red, hard, high plasticity	Shale bedrock	20-23	38
			TD Drilled: 23 ft Dry upon completion			

GORDON ENVIRONMENTAL PSC
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

MONITORING WELL LOG

Well Name: **Monitoring Well VZ-7** CP-1692-POD-6

Site Name:	Sundance Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84):	32°, 26', 57.9" N, 103°, 05', 14.0" W	**Drilled Depth:**	49 ft
L.S. Elevation (feet):		**Cased Depth:**	49 ft
Drill Date	11/14/17	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer		
Drilling Method:	Hollow-Stem Auger		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011617.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details: Casing	WELL Completion Details: Annular Fill	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol	Sample Interval (feet below LS), Percent Recovery	Sample Photo Record Designation
0	Blank well casing -2" PVC Sch 40 FJ 15.0 ft below land surface to 3 ft above grade	Concrete 2 ft - 0 ft	Soil, sandy loam, 75% sand ,25% fines, yellowish red, 5YR4/6, slightly moist, loose, non plastic	SM		
			Sand, fine, silty, 75% Sand, 5% silt, lime bound nodules (caliche) yellowish red 5YR4/6, dry, firm, non plastic	SM	0-5 25%	39
5		Annular grout seal Portland Type I-II 5% bentonite 10.0 ft - 2.0 ft	Sand, fine, silty 75% sand, 25% silt, light brown 10YR8/3, very firm, dry, low plastiicity	SM	5-10 2%	40
10		1/4-in bentonite pellet - hydrated 12.0 ft - 10.0 ft	Sand, fine, silty, gravelly, 70% sand, 15% gravel, 15% fines, light brown 10YR8/3, caliche pebble clasts firm, low to medium plasticity, saturated at 14 ft	SM	10-15 25%	41
15 WL: 17 ft ▽					15-20 25%	42
20			Sand, medium to coarse, 90% sand, 10% fines, reddish brown 10R3/6, saturated, soft, non plastic, flowing sand	SW	20-25 30%	43
25	2-inch Sch 40 PVC screen 0.010 slot 49.0 ft - 14.0 ft				25-30 45%	44
30		20/40 Colorado Silica Sand 49.0 ft - 12.0 ft	Sand, silty, 80% sand, 20% fines, lime bound (caliche), brown, 10YR5/3, hard, non plastic, saturated flowing sand	SM	30-35 25%	45
35					35-40 45%	46
40			Sand, medium to coarse, gravelly, silty, 80% sand, 10% gravel, 10% fines, light brown 10YR8/3 redbed clases in bottom of sampler, firm, wet, non plastic, flowing sand	GM	40-45 70%	47
45			Shale bedrock, 100% fines, bright red, hard, high plasticity	Shale bedrock	45-49 65%	48
50			TD Drilled: 49 ft			
55						
60						

ATTACHMENT D

PHOTO RECORDS OF DRILL CORES, WELL CONSRTRUCTION MATERIALS AND SURFACE COMPLETIONS

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 1.—Core sample: Well VZ-2; 0 ft. (Sample bottoms at photo bottoms)

Photo 2.—Core sample: Well VZ-2; 5 ft. – 10 ft.

Photo 3.—Core sample: Well VZ-2; 10 ft. – 15 ft.

Photo 4.—Core sample: Well VZ-2; 15 ft. – 20 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 5.—Core sample: Well VZ-2; 20 ft. – 25 ft.

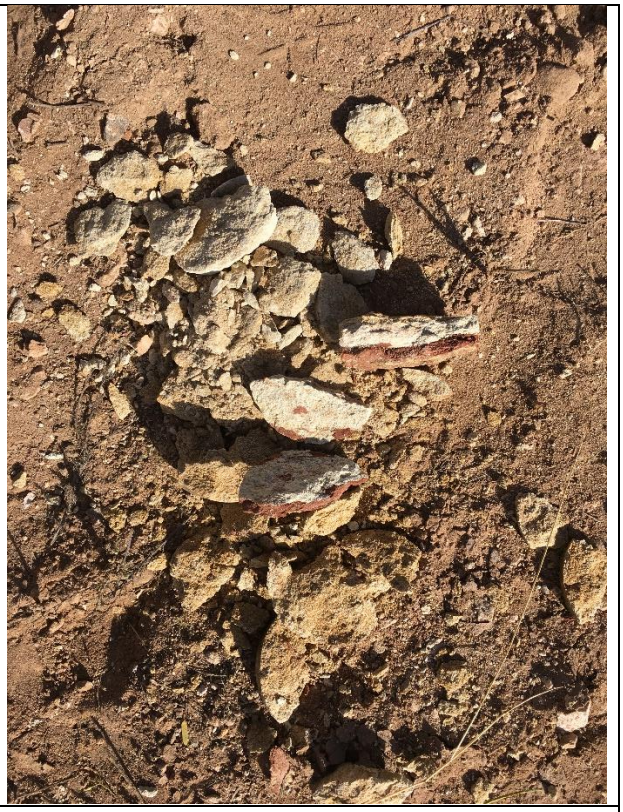

Photo 6.—Core sample: Well VZ-2; 25 ft. – 30 ft.

Photo 7.—Core sample: Well VZ-2; 30 ft. – 35 ft.

Photo 8.—Detail of core sample: Well VZ-2; 33 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 9.—Cumulative core samples: Well VZ-2; 0 ft – 35 ft.

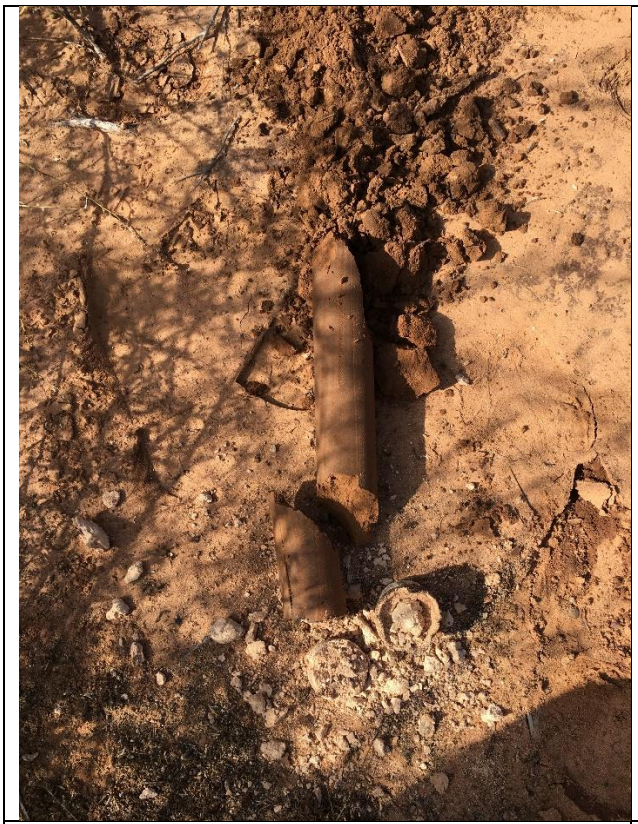

Photo 10.—Core sample: Well VZ-3; 0 ft. – 5 ft.

Photo 11.—Core sample: Well VZ-3; 5 ft. – 10 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

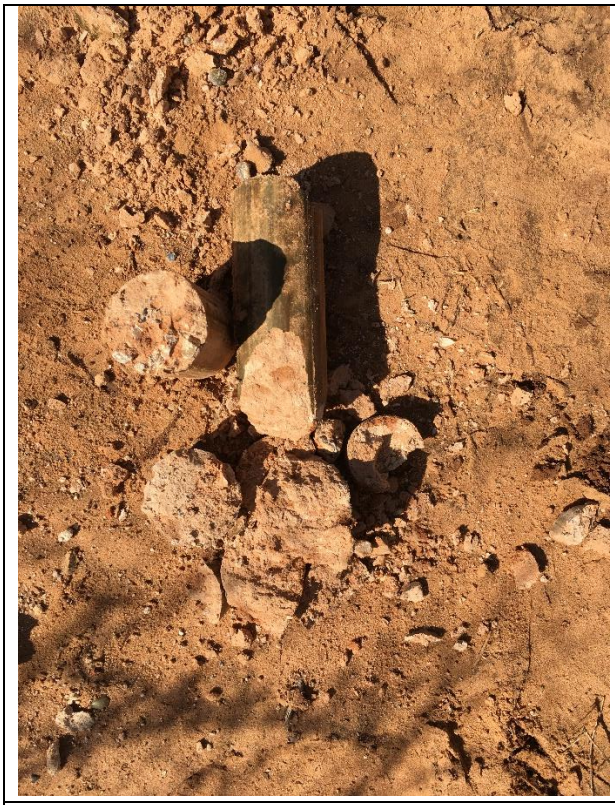

Photo 12.—Core sample: Well VZ-3; 10 ft. – 15 ft.

Photo 13.—Core sample: Well VZ-3; 15 ft. – 20 ft.

Photo 14.—Core sample: Well VZ-3; 20 ft. – 25 ft.

Photo 15.—Core sample: Well VZ-3; 25 ft. – 30 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 16.—Core sample: Well VZ-3; 30 ft. – 35 ft.

Photo 17.—Core sample: Well VZ-3; 35 ft. – 40 ft.

Photo 18.—Core sample: Well VZ-3; 40 ft. – 45 ft.

Photo 19.—Core sample: Well VZ-3; 45 ft. – 50 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 20.—Core sample: Well VZ-3; 50 ft. – 55 ft.

Photo 21.—Core sample: Well VZ-3; 55 ft. – 60 ft.

Photo 22.—Detail of core: Well VZ-3; 50 ft.

Photo 23.—Core sample: Well VZ-4; 0 ft. – 5 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

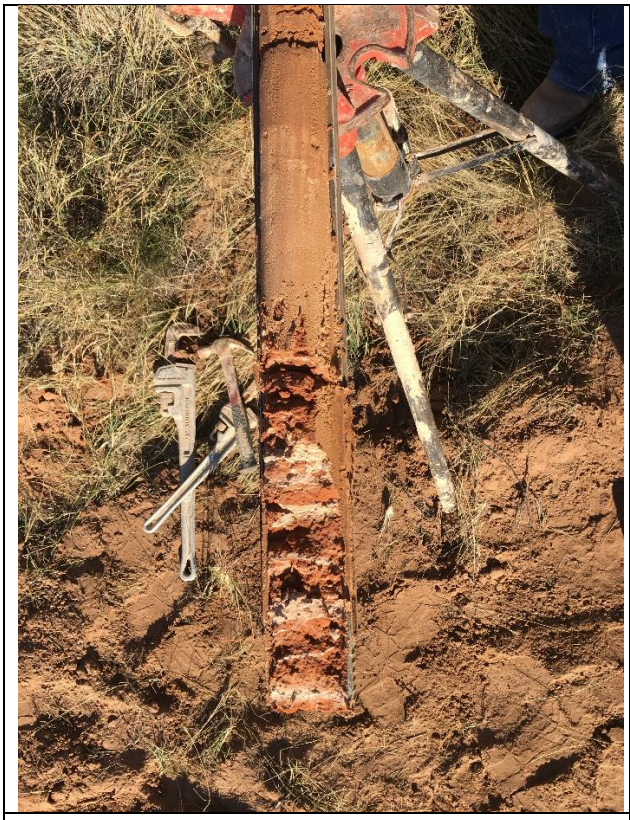

Photo 24.—Core sample: Well VZ-4; 5 ft. – 10 ft.

Photo 25.—Core sample: Well VZ-4; 10 ft. – 15 ft.

Photo 26.—Core sample: Well VZ-4; 15 ft. – 20 ft.

Photo 27.—Core sample: Well VZ-4; 20 ft. – 25 ft.

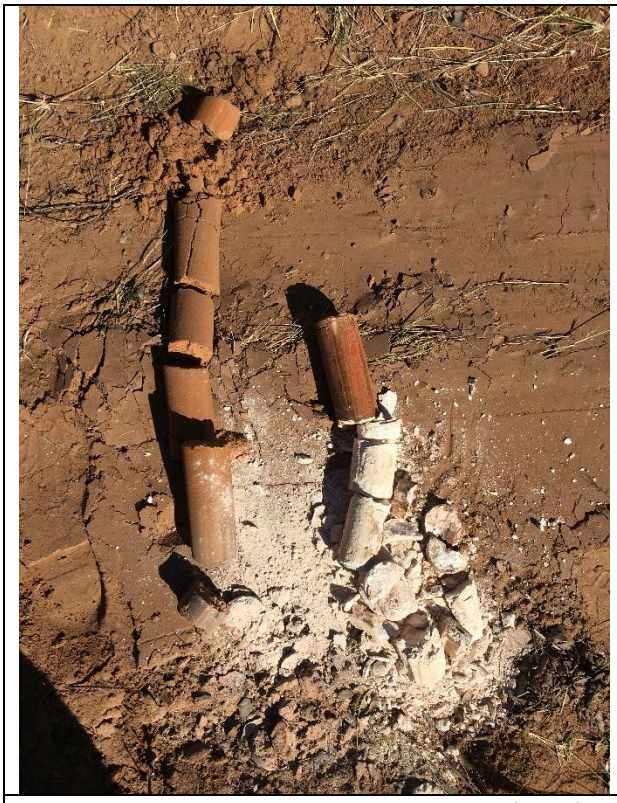	
Photo 28.—Core sample: Well VZ-5; 0– 5 ft., 5 ft. – 10 ft.	Photo 29.—Core sample: Well VZ-5; 10 ft. – 15 ft.
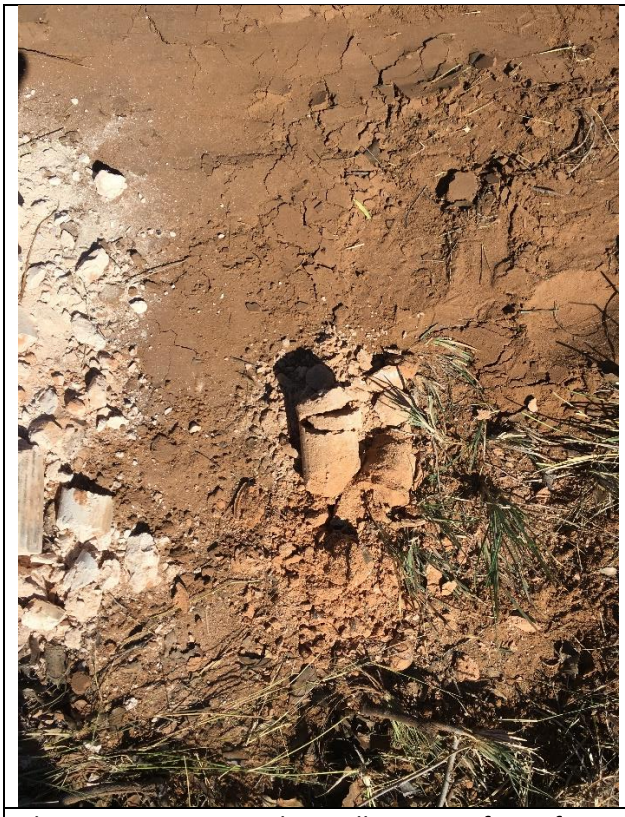	
Photo 30—Core sample: Well VZ-5; 15 ft.-20 ft.	Photo 31—Core sample: Well VZ-5; 20 ft.-25 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 32—Core sample: Well VZ-5; 25 ft.-30 ft.

Photo 33— Cumulative core samples: Well VZ-5; 0 ft – 30 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

	
Photo 34—Core sample: Well VZ-6; 0 ft.-5 ft.	Photo 35—Core sample: Well VZ-6; 5 ft.-10 ft.
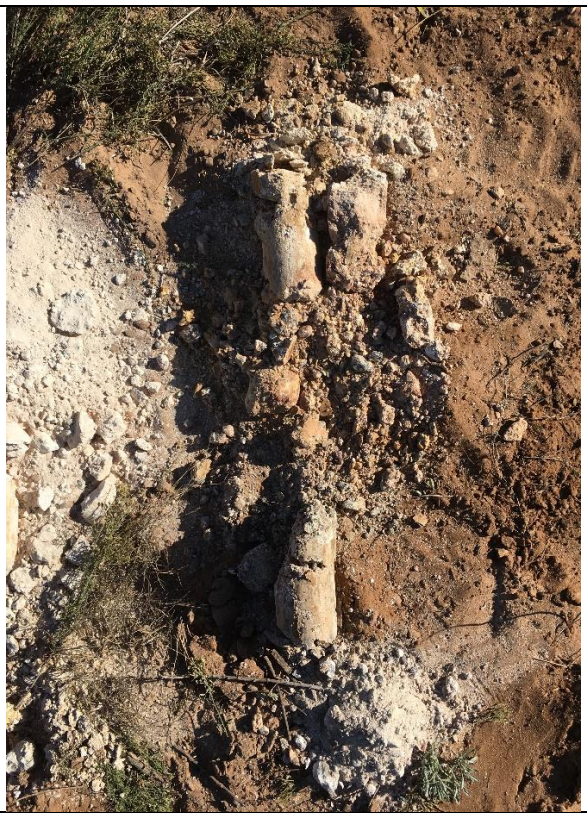	
Photo 36—Core sample: Well VZ-6; 10 ft.-15 ft.	Photo 37—Core sample: Well VZ-6; 15 ft.-20 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 38—Core sample: Well VZ-6; 20 ft.-23 ft.

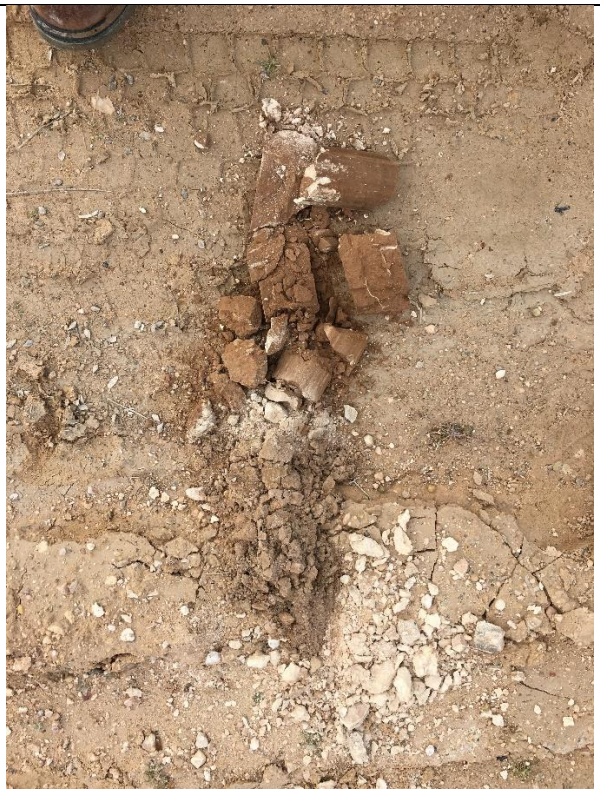

Photo 39—Core sample: Well VZ-7; 0 ft.-5 ft.

Photo 40—Core sample: Well VZ-7; 5 ft.-10 ft.

Photo 41—Core sample: Well VZ-7; 10 ft.-15 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 42—Core sample: Well VZ-7; 15 ft.-20 ft.

Photo 43—Core sample: Well VZ-7; 20 ft.-25 ft.

Photo 44—Core sample: Well VZ-7; 25 ft.-30 ft.

Photo 45—Core sample: Well VZ-7; 30 ft.-35 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 46—Core sample: Well VZ-7; 35 ft.-40 ft.

Photo 47—Core sample: Well VZ-7; 40 ft.-45 ft.

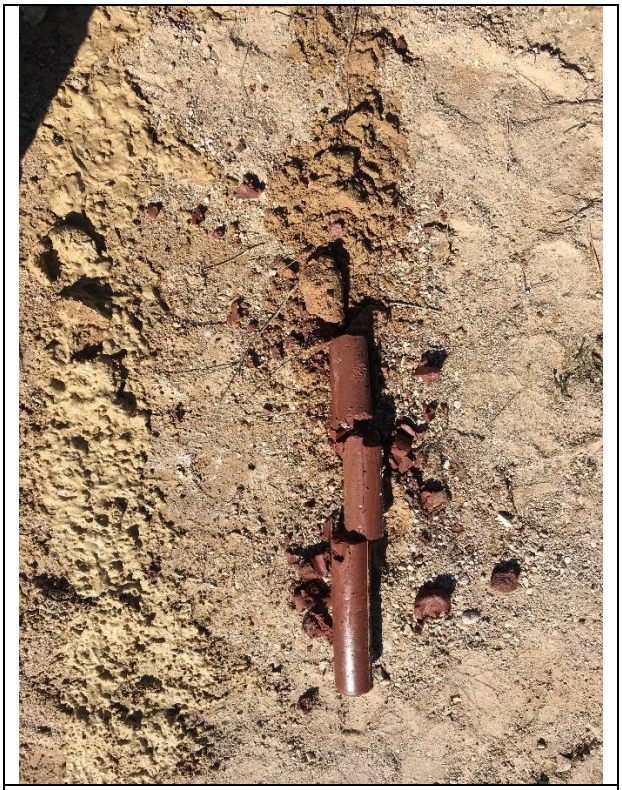

Photo 48—Core sample: Well VZ-7; 45 ft.-49 ft.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 49—Cumulative core samples: Well VZ-7; 0 ft.-49 ft.

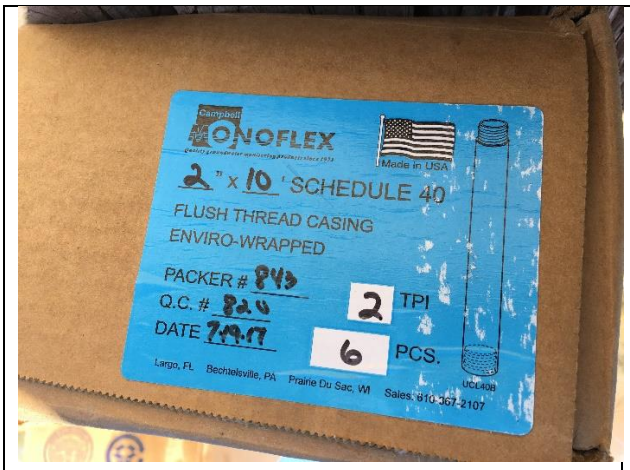

Photo 50—Well blank casing product details.

Photo 51—Well screen product details.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 52—Well casing bottom plug.

Photo 53—Well casing top plug.

Photo 54—Well annular sand pack product.

Photo 55—Well annular sand pack grade.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 56—Well annular seal product.

Photo 57—Well grout Portland product.

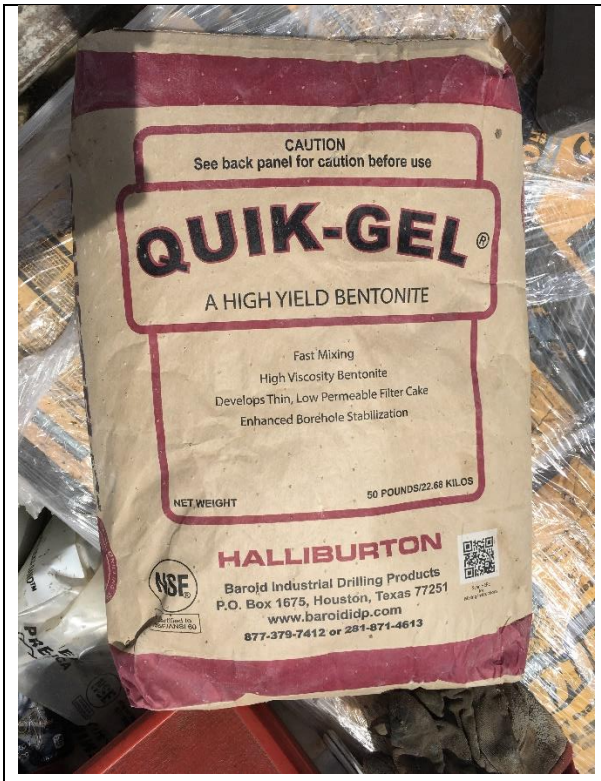

Photo 58—Well grout bentonite amendment.

Photo 59—Well gavel packing.

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

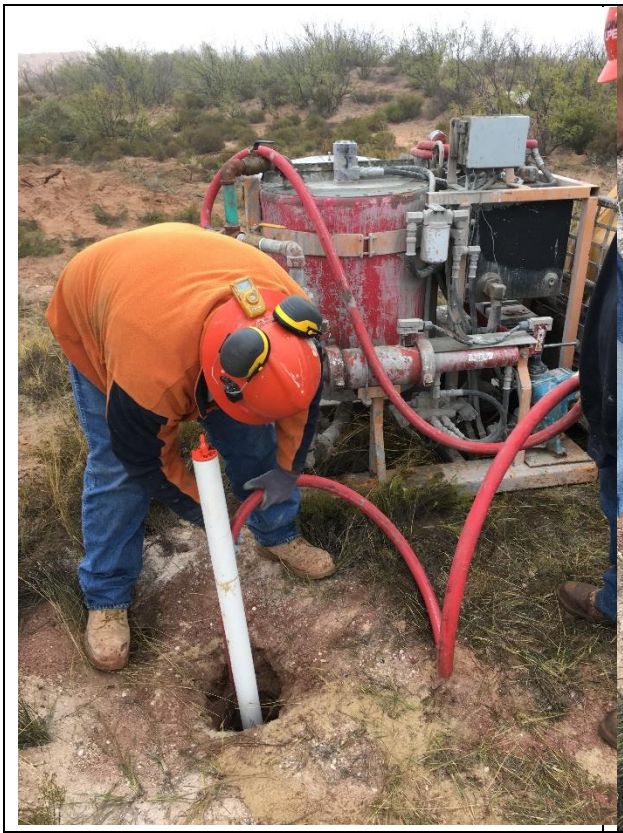

Photo 60—Well grouting 1.

Photo 61—Well grouting 2.

Photo 62—Surface completion, well VZ-2, OSE well permit no. CP-1692-POD-1

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 63—Surface completion, well VZ-3, OSE well permit no. CP-1692-POD-2

Photo 64—Surface completion, well VZ-4, OSE well permit no. CP-1692-POD-3

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 65—Surface completion, well VZ-5, OSE well permit no. CP-1692-POD-4

Photo 66—Surface completion, well VZ-6, OSE well permit no. CP-1692-POD-5

Sundance Services, LLC, Vadose Zone Monitoring Wells VZ-1 through VZ-7 Installation Photo Record.

Photo 67—Surface completion, well VZ-7, OSE well permit no. CP-1692-POD-6

ATTACHMENT E

NMOSE WELL RECORDS FOR VADOSE ZONE WELLS

(DRAFT, FINALS TO BE PROVIDED BY DRILLER)

Sundance Well No VZ-1
page 1

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER):	OSE FILE NUMBER(S): CP 1014
WELL OWNER NAME(S): Sundance Services, Inc./Contact: Mr. Joe Carrillo, Plant Manager	PHONE (OPTIONAL): 575-394-2511
WELL OWNER MAILING ADDRESS: 1001 6th Street	CITY: Eunice; STATE: NM; ZIP: 88231

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	26	54.60	N
LONGITUDE	103	4	25.80	W

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

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS:

2. OPTIONAL

(2.5 ACRE)	(10 ACRE)	(40 ACRE)	(160 ACRE)	SECTION	TOWNSHIP	RANGE
SW ¼	NW ¼	NW ¼	SW ¼	28	21 ☐ NORTH ☑ SOUTH	38 ☑ EAST ☐ WEST

SUBDIVISION NAME	LOT NUMBER	BLOCK NUMBER	UNIT/TRACT
in Lea County			

HYDROGRAPHIC SURVEY	MAP NUMBER	TRACT NUMBER

3. DRILLING INFORMATION

LICENSE NUMBER	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
WD225	John Aguirre	Rodgers & Co., Inc.

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4/12/09	4/12/09	22	22	Unknown

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): N/A

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

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

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	17	7.25	PVC casing	Flush thread joint	2	Sch 40 PVC	
17	22	7.25	PVC screen	Flush thread joint	2	Sch 40 PVC	0.020

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)
16	22	6	Sand; silty v. fine to fine; reddish yellow to med. tan; moist	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA	TOTAL ESTIMATED WELL YIELD (GPM)
N/A	N/A

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO
2009 MAY 22 A 10: 34

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

602257

FILE NUMBER CP-1014	POD NUMBER	TRN NUMBER ~~423003~~
LOCATION 21.38.28.3113		PAGE 1 OF 2

Monitor

Sundance Well No VZ-1
page 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	13	7.25	Cement/bentonite	3.3	Tremie
	13	15	7.25	Bentonite pellets	.5	Tremie
	15	22	7.25	10/20 silica sand	1.8	Tremie

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	16	16	Fill, fine sand, variable gravel and silt, mixed caliche; dry to s. moist	☐ YES ☐ NO
16	22	6	Sand: silty v. fine to fine; reddish yellow to med. tan; moist	☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ YES ☐ NO
				☐ 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:

PGI-8.

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:

John Aguirre ITG — SIGNATURE OF DRILLER

05/20/09 — DATE

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

FILE NUMBER CP-1014	POD NUMBER	TRN NUMBER ~~428003~~
LOCATION 21.38.28.3113		PAGE 2 OF 2

Monitor

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-1	VZ-2	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	41.2	N
	LONGITUDE	103	0	26.7	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

T. 21 S. R. 38 E. S. 29.4442

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/17/2017	11/17/2017	35	35	Dry (Vadose Zone MW)

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): Dry (Vadose Zone MW)

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	25	7 7/8	PVC	Flush joint	2	Schedule 40	blank
25	35	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	21	7 7/8	Grout, portland neat cement with 5% bentonite powder	5.7	tremmied from bottom
21	23	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
23	35	7 7/8	20/40 grade silica sand	3.6	poured in auger, tagged

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 1 OF 2

Sundance Well No VZ-2
page 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	3	3	Soil, sandy loam, yellowish red, 5YR4/6, dry, loose, non plastic	Y ✓ N	
3	16	13	Caliche, silty gravelly sand, lt brown, 10YR8/3, dry, hard, non plastic	Y ✓ N	
16	19	3	Sand, silty, gravelly, yellowish red 5YR4/6, dry, hard, low plasticity	Y ✓ N	
19	21.5	2.5	Silt, clayey, sandy, gravelly, reddish brown, redbed detritus, hard, med. plasticity	Y ✓ N	
21.5	29	7.5	Silt, sandy, light greenish grey, grades down to sand, loose, dry, hard, non plastic	Y ✓ N	
29	35	5	Dockum Group Shale, maroon, interbedded sandy, silty, dry hard, non plastic	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	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 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: Dry hole, completed as a vadose zone monitoring well.

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME _____ DATE _____

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 2 OF 2

Sundance Well No. VZ-3
page 1

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-2	VZ-3	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	37.4	N
	LONGITUDE	103	04	40.6	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
T. 21 S. R. 38 E. S. 29.4432

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/16/2017	11/16/2017	60	60	Dry (Vadose Zone MW)

COMPLETED WELL IS: ☐ ARTESIAN ☑ DRY HOLE ☐ SHALLOW (UNCONFINED)
STATIC WATER LEVEL IN COMPLETED WELL (FT): Dry (Vadose Zone MW)

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	50	7 7/8	PVC	Flush joint	2	Schedule 40	blank
50	60	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	46	7 7/8	Grout, portland neat cement with 5% bentonite powder	13.2	tremmied from bottom
46	48	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
48	60	7 7/8	20/40 grade silica sand	3.6	poured in auger, tagged

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 1 OF 2

Sundance Well No VZ-3
page 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	5	5	Soil, sandy loam, yellowish red, 5YR4/6, slightly moist, loose, non plastic	Y ✓ N	
5	8	3	Caliche, sand, silty, gravelly, lt brown 10YR8/3, moist, soft, low plasticity	Y ✓ N	
8	13	5	Sand, silty, caliche laminae, lt brown, 10YR8/3, sl moist, firm, med. plasticity	Y ✓ N	
13	19	6	Caliche, sand, silty, gravelly, lt brown 10YR8/3, moist, firm, med. plasticity	Y ✓ N	
19	26	7	Caliche, sand, silty, gravelly, pink-brown, moist, firm, low. plasticity	Y ✓ N	
26	32	6	Sand, silty, gravelly, redbed clasts, red-brown 10YR3/6, moist, firm, low plast	Y ✓ N	
32	36	4	Marl, sandy silt, green-grey 5G6/1, sl. moist, hard, low plasticity	Y ✓ N	
36	60	24	Sandstone, fine, silty, fissile, mica-parting, olive grey, moist@40, hard, non plas	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): 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: Moisture observed in upper portion of indurated sandstone at 40 ft. Well dry upon completion.

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME _____ DATE _____

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

Sundance Well No. VZ-4
page 1

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-3	VZ-4	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	36.0	N
	LONGITUDE	103	04	50.9	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

T. 21 S. R. 38 E. S. 29.4332

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/15/2017	11/15/2017	25	25	14.5

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): 4

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	15	7 7/8	PVC	Flush joint	2	Schedule 40	blank
15	25	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	11	7 7/8	Grout, portland neat cement with 5% bentonite powder	2.7	tremmied from bottom
11	13	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
13	25	7 7/8	20/40 grade silica sand	3.6	poured in auger, tagged

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 1 OF 2

Surface Well No. VZ-24

page 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
0	3	3	Soil, sandy loam, yellowish red, 5YR4/6, slightly moist, loose, non plastic	Y ✓ N	
3	8	5	Sand, silty, yellowish red 5YR4/6, sl. moist, loose, non plastic	Y ✓ N	
8	14.5	6.5	Sand, silty, lt yellow-red, very moist, loose, low plasticity	Y ✓ N	
14.5	22	7.5	Sand, silty, lt yellow-red, saturated, loose, low plasticity	✓ Y N	0.75
22	25	3	Dockum Group Shale, (clay), bright red, hard, high plasticity	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	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☑ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 0.75

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME _____ DATE _____

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-4	VZ-5	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	38.9	N
	LONGITUDE	103	05	0.3	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

T. 21 S. R. 38 E. S. 29.3441

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/15/2017	11/15/2017	30	30	Dry (Vadose Zone MW)

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): Dry (Vadose Zone MW)

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	20	7 7/8	PVC	Flush joint	2	Schedule 40	blank
20	30	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	16	7 7/8	Grout, portland neat cement with 5% bentonite powder	4.2	tremmied from bottom
16	18	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
18	30	7 7/8	20/40 grade silica sand	3.6	poured in auger, tagged

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 1 OF 2

Sundance Well No VZ-5
page 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	7	7	Soil, sandy loam, yellowish red, 5YR4/6, dry, loose, non plastic	Y ✓ N	
7	17	10	Caliche, sand, silty, lt brown 10YR8/3, dry, firm, non plastic	Y ✓ N	
17	19	2	Sand, silty, orange-buff, firm, friable, sl moist, low plasticity	Y ✓ N	
19	23	4	Gravel, silty, sandy, ornge-buff, sl moist, firm, low plasticity	Y ✓ N	
23	27	4	Sand, silty, gravelly, orange, firm, slightly moist, low plasticity	Y ✓ N	
27	30	3	Dockum Group Shale, clayey, red, hard, high plasticity	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): 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: Dry hole, completed as vadose zone monitoring well.

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME _____ DATE _____

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

Sundance Well No. VZ-6
page 1

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-5	VZ-6	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	43.6	N
	LONGITUDE	103	05	7.8	W

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

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

T. 21 S. R. 38 E. S. 29.3413

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/17/2017	11/17/2017	35D 18M 41.6S	35D 18M 41.6S	Dry (Vadose Zone MW)

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): Dry (Vadose Zone MW)

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	13	7 7/8	PVC	Flush joint	2	Schedule 40	blank
13	23	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	9	7 7/8	Grout, portland neat cement with 5% bentonite powder	2.1	tremmied from bottom
9	11	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
11	23	7 7/8	20/40 grade silica sand	3.6	poured in auger, tagged

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	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	3	3	Soil, sandy loam, yellowish red, 5YR4/6, dry, loose, non plastic	Y ✓ N	
3	9	6	Caliche, sand, silty, lt brown 10YR8/3, dry, firm, non plastic	Y ✓ N	
9	16	7	Caliche, sand, gravelly, reddish-grey, hard, slightly moist, non plastic	Y ✓ N	
16	18	2	Gravel, sandy, pink-grey, firm, slightly moist, non plastic	Y ✓ N	
18	20	20	Marl, silty, light grey N7, very firm, slightly moist, low plasticity	Y ✓ N	
20	23	3	Dockum Group Shale, clayey, bright red, hard, high plascitity	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	
				Y N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:

☐ PUMP ☐ AIR LIFT ☐ BAILER ☐ OTHER – SPECIFY:

TOTAL ESTIMATED WELL YIELD (gpm): 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: Dry hole completed as a vadose zone monitoring well.

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME _____ DATE _____

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

page 1

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
CP-1692-POD-6	VZ-7	

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance Services, Inc.	

WELL OWNER MAILING ADDRESS	CITY	STATE	ZIP
PO Box 1737	Eunice	NM	88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	57.9	N
	LONGITUDE	103	05	14.0	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

T. 21 S. R. 38 E. S. 29.3124

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
		Talon LPE Drilling

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
11/14/2017	11/14/2017	49	49	14

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

STATIC WATER LEVEL IN COMPLETED WELL (FT): 16

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

DRILLING METHOD: ☐ ROTARY ☐ HAMMER ☐ CABLE TOOL ☑ OTHER – SPECIFY: Hollow-stem auger

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 (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
0	14	7 7/8	PVC	Flush joint	2	Schedule 40	blank
14	49	7 7/8	PVC	Flush joint	2	Schedule 40	0.010

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	2	7 7/8	Concrete, poured with surface apron at surface	0.6	poured
2	10	7 7/8	Grout, portland neat cement with 5% bentonite powder	2.4	tremmied from bottom
10	12	7 7/8	1/4-inch bentonite pellets, hydrated in place	0.6	poured in auger, tagged
12	49	7 7/8	20/40 grade silica sand	11.1	poured in auger, tagged

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.
LOCATION	WELL TAG ID NO.	PAGE 1 OF 2

Sundance Well No VZ-7
page 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	3	3	Soil. sandy loam, yellowish red, 5YR4/6, slightly moist, loose, non plastic	Y ✔ N	
3	6	3	Caliche, sand, silty, yellowish red 5YR 4/6, dry, firm, non plastic	Y ✔ N	
6	8	2	Sand, fine, silty, lt brown, 10YR8/3, very firm, dry, low plasticity	Y ✔ N	
8	14	6	Sand, silty gravelly, lt brown 10YR8/3 caliche clasts, moist, firm, med plasticity	Y ✔ N	
14	22	8	Sand, as above, saturated at 14 ft, flowing into augers	✔ Y N	
22	29	7	Sand, med-coarse, red-brown 10R3/6, soft, non plastic, saturated. flowing	✔ Y N	1.00
29	40	11	Caliche, sand, silty. l brown 10YR8/3. hard, non plastic, sat flowing sand	✔ Y N	
40	47	7	Sand, gravelly, silty, lt brown 10YR8/3, redbed clasts in lower. firm, wet n-plast	✔ Y N	2.00
47	49	2	Dockum Group Shale bedrock, bright red, hard, high plasticity	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): 3.00

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: Bailed 18 gal from well in 30 minutes with 1 ft wl drawdown.

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 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME — DATE

FOR OSE INTERNAL USE — WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

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 125073

CONDITIONS

Operator:	OGRID:
SUNDANCE SERVICES, INC. P.O. Box 1737 Eunice, NM 88231	149972
	Action Number: 125073
	Action Type: [C-137] Non-Fee SWMF Submittal (SWMF NON-FEE SUBMITTAL)

CONDITIONS

Created By	Condition	Condition Date
bjones	None	7/13/2022