NM1-62

Vadose Zone Well Installation

June 2018

Vadose Zone Monitoring Well Installation Report

SUNDANCE WEST, INC.,
OILFIELD WASTE DISPOSAL SITE
Lea County, New Mexico

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 For:

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

Prepared By:

Gordon Environmental/PSC
333 Rio Rancho Blvd., Suite 400
Rio Rancho, NM 87124
505.867.6990

June 2018

Gordon/PSC Project #: 01011717

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1.0 PROJECT SUMMARY

The Sundance West, Inc., Oilfield Waste Disposal Site (SWI) is an active Facility operating pursuant to its current Permit (NM1-62) tentatively issued by the New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division (NMOCD) on 10/1/2017. A Vadose Zone Monitoring Plan (VZM Plan) for the facility was filed with NMOCD as part of the Application for Permit by SWI on 10/11/2016 and tentative agency approval, with Conditions, was granted in correspondence dated 1/10/2017.

The purpose of the VZM Plan is to comply with the requirements of 19.15.36.8.C(9) and 19.15.36.18 NMAC. The VZM Plan provides plans for the monitoring, recordkeeping, and reporting procedures for the site's vadose zone monitoring system.

Due to the absence of shallow protectable fresh groundwater resources at the facility, the VZM 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 VZM Plan, as well as documentation of installation of the Vadose Zone Monitoring Well network.

2.0 FACILITY DESCRIPTION

The SWI Facility is located directly west and contiguous with, Sundance Services Inc. (SSI), and approximately 1.5 miles east of the intersection of Wallach Ln. and NM highway 18 as shown on **Figure 1**. The SWI site is comprised of a 320-acre ± tract of land located in the South ½ of Section 30, Township 21 South, Range 38 East, Lea County, New Mexico.

Located in the Process Area, 6 Evaporation Ponds have been constructed as the initial component of a new facility, and will eventually be complemented with process equipment, administrative offices, and a landfill. The total double lined project area is currently approximately 15 acres in size with each of the 6 ponds comprising approximately 1.75 acres each, with the remaining double lined acreage comprising the area between and around the ponds as shown on **Figure 2**.

The waste management facility is intended for the permanent disposal of exempt and non-exempt/non-hazardous oil field waste and will eventually include a processing area on 80 acres and a landfill on 180 acres. The landfill will have a waste capacity of approximately 17.4 million cubic yards. The remaining 60 acres of the facility incorporates associated infrastructure and buffer areas.

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 VZM Plan are set forth in Volume II, Section 8, of the Application for Permit, (Gordon, 2016).

The intent of the VZM Plan is to provide for the earliest possible detection of potential fluid releases from the processing area or landfill. 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 SWI Oilfield Waste Disposal Site 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 nearby waste disposal facilities including the WCS Site, LCLF, and LES NEF, which are located immediately to the southeast of the SWI Site as shown on Figure II.8.3 of the VZM Plan. The Chinle terrain map was used to determine the most likely locations where fugitive fluids would be expected to migrate from the facility. Eight Vadose Zone Monitoring Wells (VZM Wells), as well as two existing VZM Wells were proposed as shown in Figure II.8.4 of the VZM Plan.

The NMOCD tentatively approved the Vadose Zone Monitoring Plan (VZM) Plan in correspondence dated 1/10/2017. The final approved locations of the 10 VZM Wells are shown 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, Section 3) included provisions for monitoring schedule and methods, which included initial monitoring of the VZM wells for the presence of fluids, and less frequent inspections thereafter. The NMOCD 1/10/2017 Tentative Permit Approval, Condition 6 specified that VZM Well monitoring should be performed. The VZM wells will be monitored for the presence of free liquids on a monthly basis for a period of 12 months. If the monthly monitoring results continually indicate the absence of fluid, the subject wells will be transitioned to quarterly monitoring. 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, Total Dissolved Solids, Total Petroleum Hydrocarbons in accordance with the VZM Plan (Gordon, 2016, Table II.8.2), and the full list of volatile organic compounds (EPA Method 8260) as specified in Condition 6 of the NMOCD 1/10/2017 Tentative Permit Approval.

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 through VZ-10 were filed on NMOSE Form WR-07. Permits for the wells were issued on April 10, 2009 (VZ-1 and 4), and on October 18, 2017 (VZ 2,3, and 5-10). 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. Notice was made on 2/27/18 of the proposed drilling. 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

Existing Vadose Zone Monitoring Wells VZ-1 (formerly MP-2P) and VZ-4 (formerly MP-4P) were installed by Rodgers & Co., Albuquerque, NM on April 19, 2009 and April 5, 2009 respectively. VZM Wells 2,3, and 5-10 were installed pursuant to completion of the VZM Plan commitments. VZM Wells 2,3, and 5-10 were installed by Talon, LPE Drilling, Amarillo, Texas, between March 6, 2018 and April 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 and water-bearing potential. 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 1-8).

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 9-20.

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 21-28.

5.0 WELL COMPLETIONS, PENETRATED MATERIALS, SATURATED ZONES

The locations of the VZM wells, depths of screens and tops of penetrated zones, are summarized in **Table 1**. None of the wells penetrated saturated sediments above the Chinle Group bedrock. Depths of completed VZ wells 2,3, and 5-10 range from 35 feet to 65 feet. Details of penetrated sediments, saturated intervals and well completions are discussed below (**Attachment E**).

Well VZ-2 was installed on 3/7/2018. The well was drilled to a depth of 50 feet below land surface, penetrating 3 feet of dense red/green and clayey Chinle shale. The well was screened in the estimated interval 40 feet to 50 feet. No fluids were detected in well VZ-2 during drilling or in post completion inspections.

Well VZ-3 was installed on 3/6/2018. The well was drilled to a depth of 45 feet, penetrated 3 feet into sandy Chinle shale, and was screened in the interval 35 to 45 feet below land surface. No fluids were detected in well VZ-3 during drilling or in post completion inspections.

Well VZ-5 was installed on 3/7/2018. The well was drilled to a depth of 35 feet, penetrating 6 feet of red clayey Chinle shale. The well was screened in the interval 25-35 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 4/5/2018. The well was advanced to a depth of 45 feet, penetrating 3 feet of dense, clayey Chinle shale. The well was screened in the interval 35-45 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 4/4/2018. The well was advanced to a depth of 50 feet and penetrated 4 feet into sandy siltstone of the Chinle. The well was screened in the interval 40-50 feet below land surface. No fluids were detected in well VZ-7 during drilling or in post completion inspections.

Well VZ-8 was installed on 3/8/2018. The well was drilled to a depth of 60 feet and penetrated 4 feet of sandstone in the Chinle. The well was screened in the interval 50-60 feet below land surface. No fluids were detected in well VZ-8 during drilling or in post completion inspections.

Well VZ-9 was installed on 4/4/2018. The well was drilled to a depth of 65 feet and penetrated 3 feet of shale in the Chinle. The well was screened in the interval 55-65 feet below land surface. No fluids were detected in well VZ-9 during drilling or in post completion inspections.

Well VZ-10 was installed on 4/2/2018. The well was drilled to a depth of 60 feet and penetrated 4 feet of weathered sandstone in the Dockum (Chinle). The well was screened in the interval 50-60 feet below land surface. No fluids were detected in well VZ-10 during drilling or in post completion inspections.

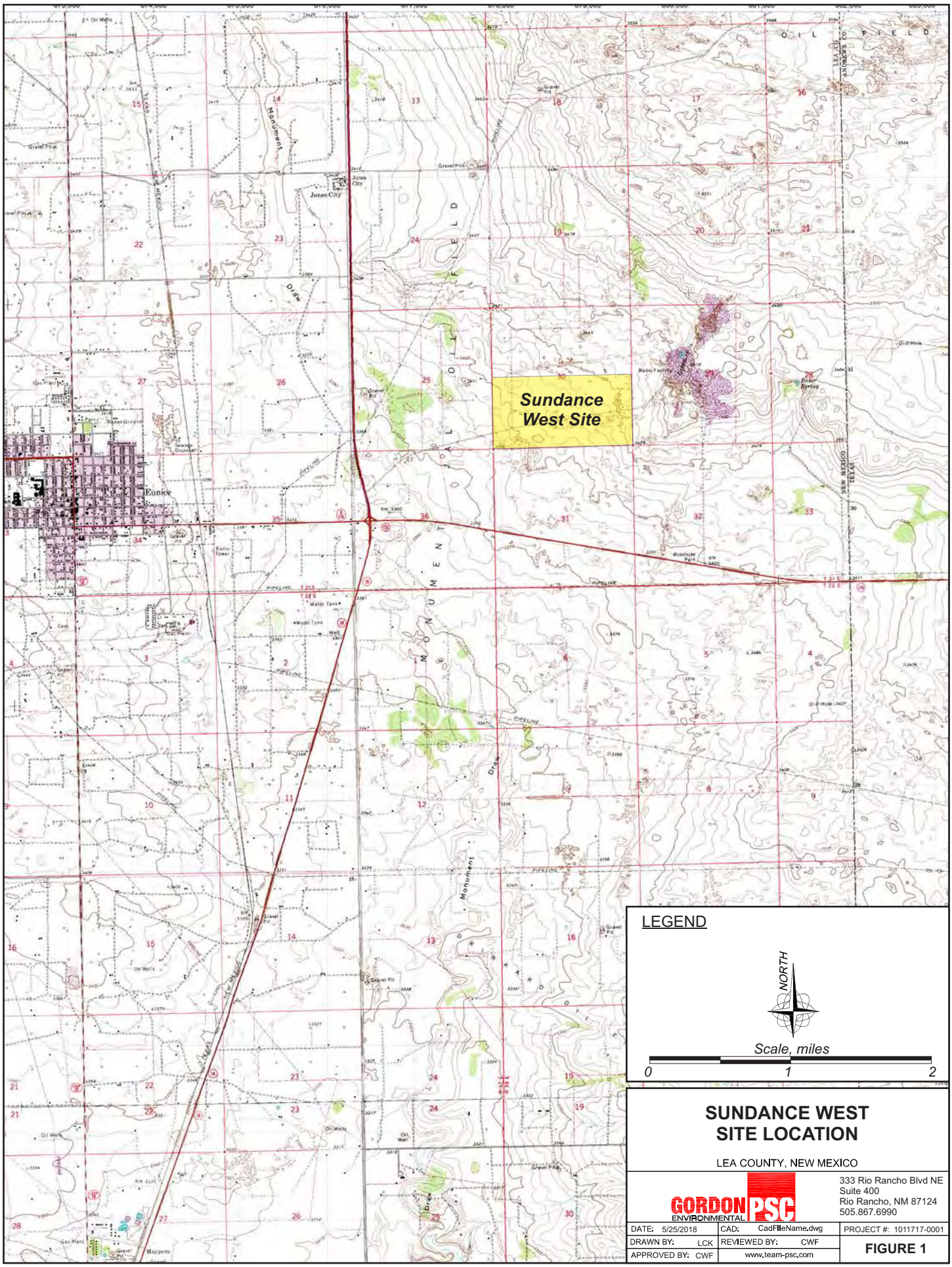
6.0 CONCLUSIONS

This submittal completes the VZM Plan commitments for VZM Well completion and initial monitoring. No subsurface fluid saturations were discovered in any of the newly drilled wells VZM Wells 2, 3, and 5-10.

7.0 REFERENCES

1. Gordon Environmental/PSC, October 2016, Vadose Zone Monitoring Plan, Sundance West, Inc. Consultant report prepared for Sundance West, Inc.
2. Barnes, V., 1976, Geologic Atlas of Texas, Hobbs Sheet, Texas Bureau of Economic Geology

FIGURES

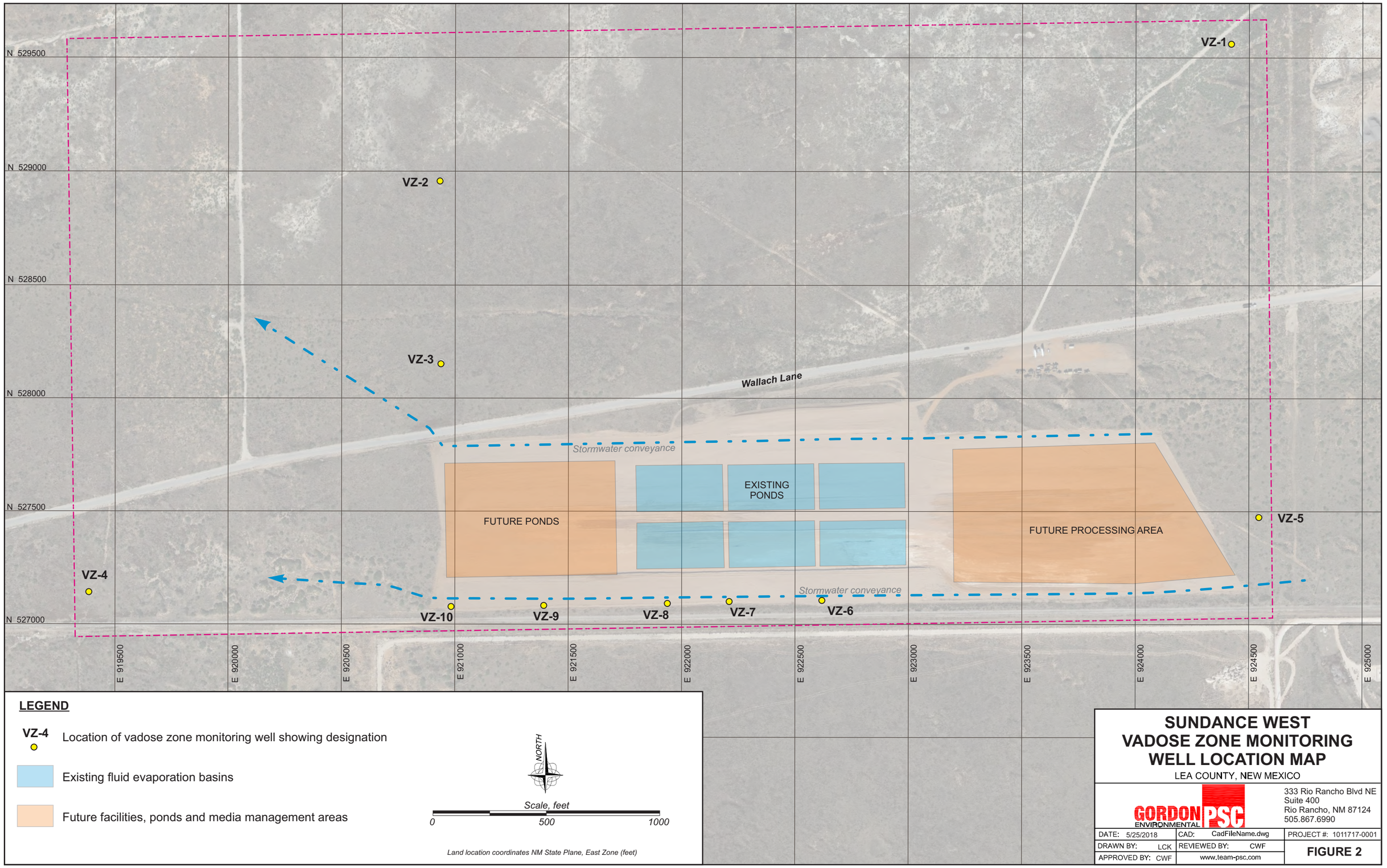


SUNDANCE WEST SITE LOCATION

LEA COUNTY, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd NE
Suite 400
Rio Rancho, NM 87124
505.867.6990

DATE: 5/25/2018	CAD: CadFileName.dwg	PROJECT #: 1011717-0001
DRAWN BY: LCK	REVIEWED BY: CWF	FIGURE 1
APPROVED BY: CWF	www.team-psc.com	



LEGEND

VZ-4 Location of vadose zone monitoring well showing designation

Existing fluid evaporation basins

Future facilities, ponds and media management areas

NORTH

Scale, feet

0 500 1000

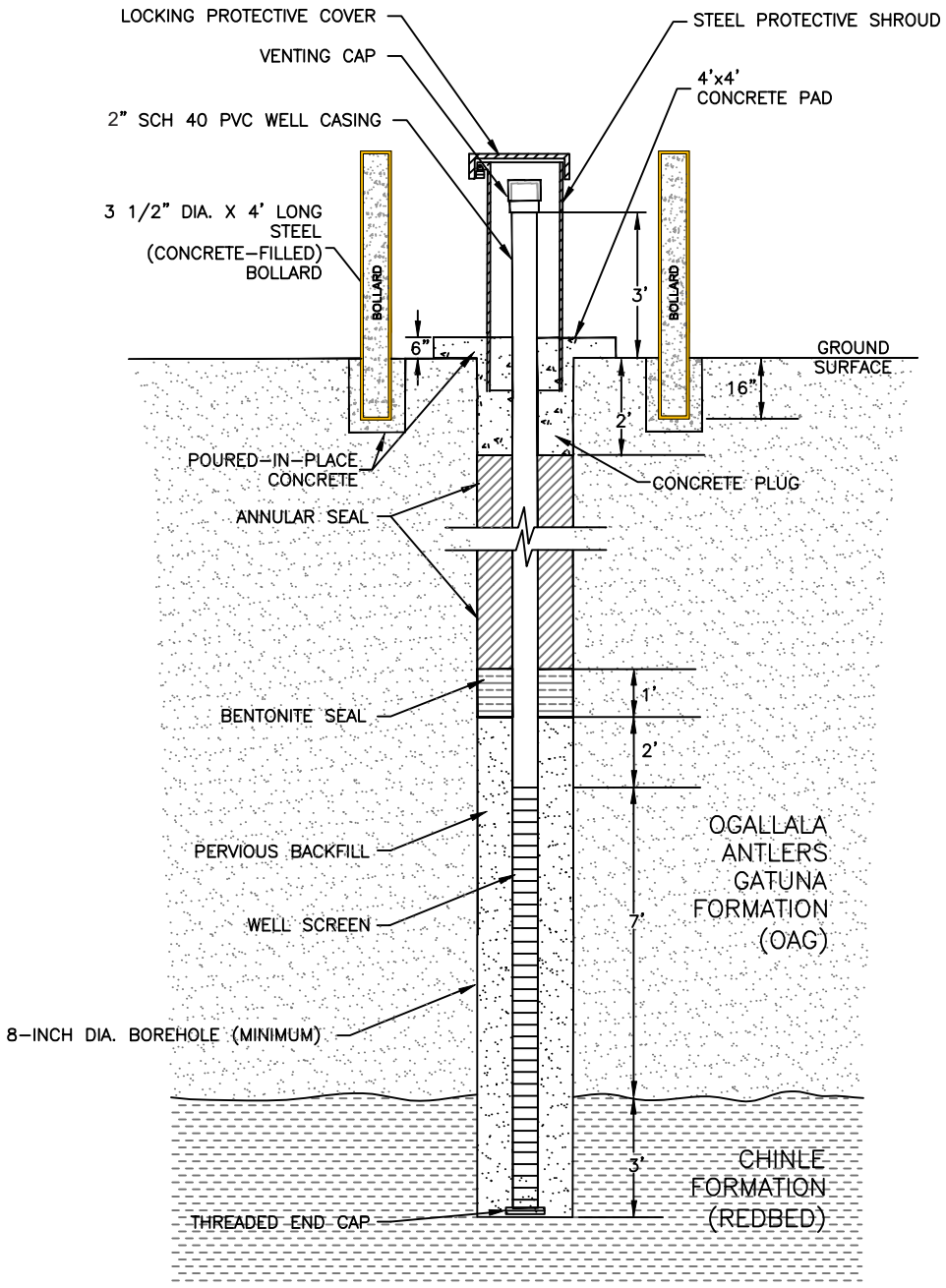
Land location coordinates NM State Plane, East Zone (feet)

SUNDANCE WEST VADOSE ZONE MONITORING WELL LOCATION MAP

LEA COUNTY, NEW MEXICO

GORDON ENVIRONMENTAL PSC
333 Rio Rancho Blvd NE
Suite 400
Rio Rancho, NM 87124
505.867.6990

DATE: 5/25/2018	CAD: CadFileName.dwg	PROJECT #: 1011717-0001
DRAWN BY: LCK	REVIEWED BY: CWF	FIGURE 2
APPROVED BY: CWF	www.team-psc.com	



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

SUNDANCE WEST GENERAL VADOSE ZONE WELL COMPLETION DETAILS

LEA COUNTY, NEW MEXICO

GORDON PSC ENVIRONMENTAL
333 Rio Rancho Blvd NE
Suite 400
Rio Rancho, NM 87124
505.867.6990

DATE: 5/25/2018	CAD: CadFileName.dwg	PROJECT #: 1011717-0001
DRAWN BY: LCK	REVIEWED BY: CWF	**FIGURE 3**
APPROVED BY: CWF	www.team-psc.com	

TABLE 1

LOCATIONS AND COMPLETION DETAILS OF VADOSE ZONE MONITORING WELLS

Table 1.--Locations and Completion Details of Vadose Zone Monitoring Wells
Sundance West, Inc., Oilfield Waste Disposal Site

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	CP-1016	32	26	59.5	103	05	28.6	28	27	23	28	dry	0	Drilled 4/19/09
VZ-2	CP-1694-POD 1	32	26	53.3	103	06	10.1	50	47	40	50	dry	0	
VZ-3	CP-1694-POD 2	32	26	45.4	103	06	10.2	45	42	35	45	dry	0	
VZ-4	CP-1018	32	26	37.4	103	06	26.2	60	45	50	60	dry	0	Drilled 4/24/09
VZ-5	CP-1694-POD 3	32	26	38.3	103	05	28.2	35	29	25	35	dry	0	
VZ-6	CP-1694-POD 4	32	26	34.7	103	05	50.8	45	42	35	45	dry	0	
VZ-7	CP-1692-POD 5	32	26	34.7	103	05	55.6	50	46	40	50	dry	0	
VZ-8	CP-1692-POD 6	32	26	35.0	103	05	58.8	60	56	50	60	dry	0	
VZ-9	CP-1692-POD 7	32	26	35.2	103	06	3.86	65	62	55	65	dry	0	
VZ-10	CP-1692-POD 8	32	26	34.8	103	06	10.0	60	56	50	60	dry	0	

Notes:
All depths, feet below land surface

ATTACHMENT A

NMOSE PERMITS FOR VADOSE ZONE MONITORING WELLS

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: 615134
File Nbr: CP 01694 POD1-8

Oct. 18, 2017

CHARLES FIELDER, PE
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 10/31/2018, 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 10/31/2018.

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

Sincerely,

for Juan Hernandez
(575)622-6521

Enclosure

explore

File No. CP-1694

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:

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

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 West, Inc.	Name: Charles Fiedler, P.E., 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: ☐ Home ☐ Cell Phone (Work):	Phone: 505-750-3164 ☐ Home ☒ Cell Phone (Work):
E-mail (optional):	E-mail (optional):

2017 OCT - 5 AM 9:56

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO

FOR OSE INTERNAL USE

Application for Permit, Form WR-07, Rev 11/17/16

File No.: CP-1694	Trn. No.: 615134	Receipt No.:
Trans Description (optional): POD 1-8		
Sub-Basin: CP	PCW/LOG Due Date: 10-31-18	

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
CP1694 POD 1 VZ-2	103D 06M 10.1S	32D 26M 53.3S	T21S R38E S30.3233
POD 2 VZ-3	103D 06M 10.1S	32D 26M 45.3S	T21S R38E S30.3413
POD 3 VZ-5	103D 05M 28.2S	32D 26M 38.29S	T21S R38E S30.4442
POD4 VZ-6	103D 05M 47.8S	32D 26M 35.34S	T21S R38E S30.4344
POD5 VZ-7	103D 05M 33.13S	32D 26M 35.3S	T21S R38E S30.4334

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 2

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-1694 Trn No.: 615134

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
CP1694 POD6 VZ-8	103D 05M 58.7S	32D 26M 35.21S	T21S R38E S30.3444
POD7 VZ-9	103D 06M 3.9S	32D 26M 35.2S	T21S R38E S30.3443
POD8 VZ-10	103D 06M 9.8S	32D 26M 35.3S	T21S R38E S30.3343

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** 3

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

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If yes, how many________

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FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: CP-1694	Trn No.: 615134

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.	☐ 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.	☐ 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.	**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)), Charles Fiedler, P.E., 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

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 18th day of October 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-1694 Trn No.: 615134

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 10/31/2018.

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

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

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-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.

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

SPECIFIC CONDITIONS OF APPROVAL (Continued)

LOG The Point of Diversion CP 01694 POD1 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD2 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD3 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD4 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD5 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD6 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD7 must be completed and the Well Log filed on or before 10/31/2018.

LOG The Point of Diversion CP 01694 POD8 must be completed and the Well Log filed on or before 10/31/2018.

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.

NEW MEXICO STATE ENGINEER OFFICE
PERMIT TO EXPLORE

ACTION OF STATE ENGINEER

Notice of Intention Rcvd: Date Rcvd. Corrected:
Formal Application Rcvd: 10/05/2017 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 18th day of Oct A.D., 2017

Tom Blaine, P.E., State Engineer

By: Juan Hernandez

Trn Desc: CP 01694 POD1-8 File Number: CP 01694
Trn Number: 615134

File Number: _____
(For OSE Use Only)

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

2-26830
05

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): MP-2

A. NE 1/4 NE 1/4 SE 1/4 Section: 30 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 59.5 s Longitude: 103 d 5 m 28.6 s

D. East 679418 (m), North 3591905 (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.

POD Renumbered
From: CP-1014
To: CP-1016 POD 1

STATE ENGINEER OFFICE
2011 APR 11 A 11:32

Do Not Write Below This Line L02337

File Number: CP-1016 Trn Number: ~~438017~~
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/~~XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ 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 Mall
Kenneth M. Fresquez, District II Manager

STATE ENGINEER OFFICE
2009 APR -7 A 11:32

Do Not Write Below This Line L002237

File Number: CP-1016 Trn Number: 428017

Form: wr-07 page 2 of 2

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-1016 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

CP-1016

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

MP-2

Locator Tool Report

General Information:

Application ID: 28 Date: 04-02-2009 Time: 10:42:31

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):

NE 1/4 of NE 1/4 of NE 1/4 of SE 1/4 of Section 30, Township 21S, Range 38E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	59.5 Seconds	N
Longitude:	103 Degrees	5 Minutes	28.6 Seconds	W

Universal Transverse Mercator Zone: 13N

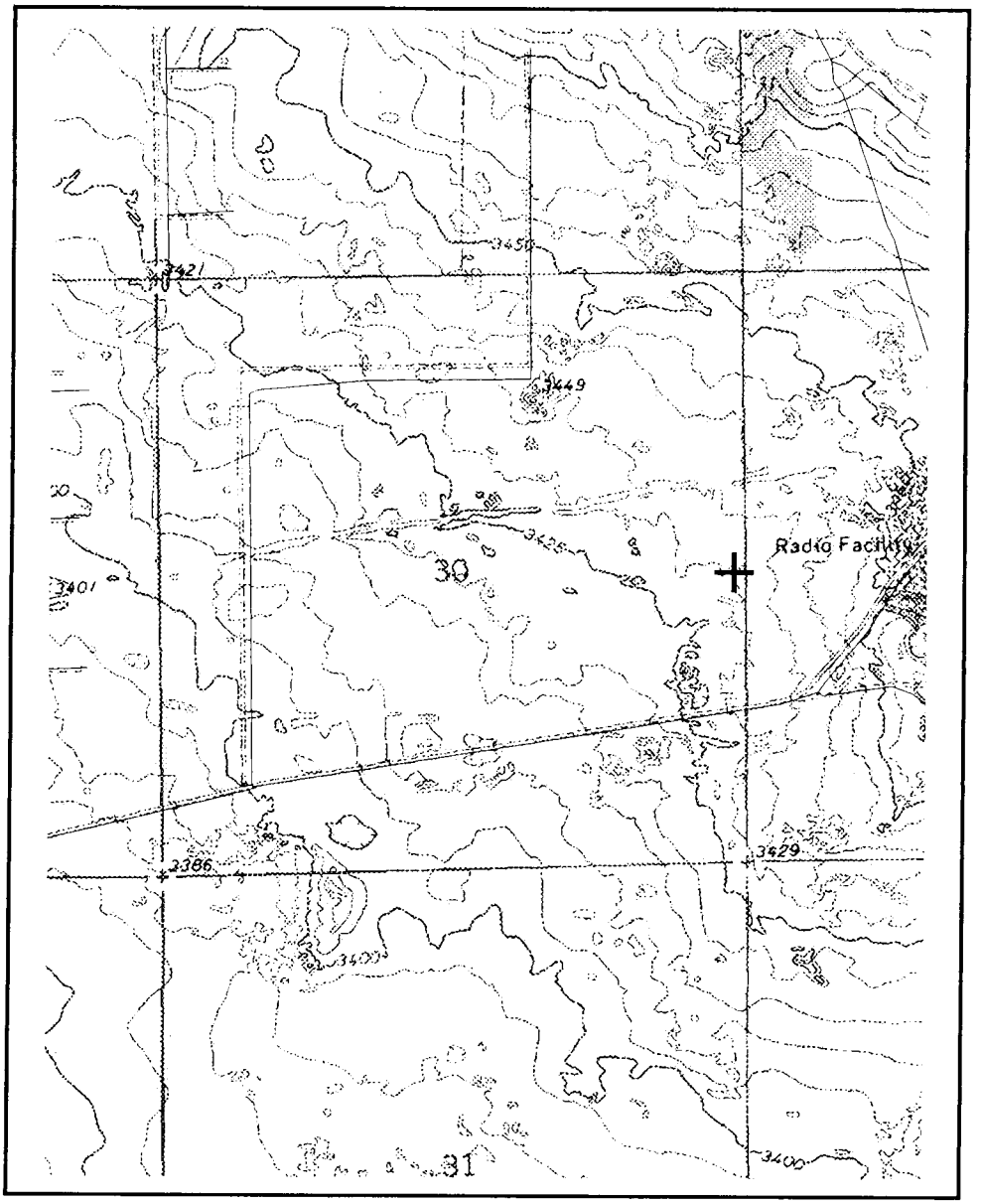
NAD 1983(92) (Meters)	N: 3,591,905	E: 679,418
NAD 1983(92) (Survey Feet)	N: 11,784,441	E: 2,229,057
NAD 1927 (Meters)	N: 3,591,729	E: 679,378
NAD 1927 (Survey Feet)	N: 11,783,865	E: 2,228,925

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 161,428	E: 281,783
NAD 1983(92) (Survey Feet)	N: 529,618	E: 924,483
NAD 1927 (Meters)	N: 161,436	E: 269,142
NAD 1927 (Survey Feet)	N: 529,646	E: 883,009

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: CP Scale: 1:20,678

Northing/Easting: UTM83(92) (Meter): N: 3,591,905 E: 679,418

Northing/Easting: SPCS83(92) (Feet): N: 529,618 E: 924,483

GW Basin: Capitan

Print Date: 04/02/2009

File Number: _____
(For OSE Use Only)

2-26830
CP-1018

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): MP-4

A. SW 1/4 SW 1/4 SW 1/4 Section: 30 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 37.4 s Longitude: 103 d 6 m 26.2 s

D. East 677925 (m), North 3591197 (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.

~~POD Renumbered~~

From: 1018

To: 1018 POD 1

RECEIVED
2007 APR -1 A 11:32
STATE ENGINEER OFFICE

Do Not Write Below This Line 602342

File Number: CP-1018 Trn Number: ~~425022~~
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/xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx 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: _____
Kenneth M. Fresquez, District II Manager

STATE ENGINEER OFFICE
2009 APR -1 A 11:32

Do Not Write Below This Line L02342

File Number: CP-1018 Trn Number: ~~428022~~

Form: wr-07

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-1018 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

RODGERS & CO., INC.

July 2, 2009

Office of the State Engineer
1900 West Second Street
Roswell, NM 88201

Re: File numbers CP 1016 and CP1018

To Whom It May Concern:

Please find enclosed, in triplicate, amended Well Records for the above-mentioned file numbers. Both bore hole depths were incorrectly marked and are corrected herein. Additionally, the geologic logs in Section 6 have been amended to reflect the deeper bore hole depths. All other information remains the same.

Sincerely,
Rodgers & Co., Inc.

Becky Gabaldon

Enclosures

STATE ENGINEER OFFICE
ROSWELL, NEW MEXICO
2009 JUL -6 A 11:45

2615 Isleta Blvd. SW ▪ Albuquerque., NM 87105 ▪ 505-877-1030, Fax: 505-877-1105

CP-1015

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

MP-4

Locator Tool Report

General Information:

Application ID: 28 Date: 04-02-2009 Time: 10:47:21

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):

NW 1/4 of SW 1/4 of SW 1/4 of SW 1/4 of Section 30, Township 21S, Range 38E.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	26 Minutes	37.4 Seconds	N
Longitude:	103 Degrees	6 Minutes	26.2 Seconds	W

Universal Transverse Mercator Zone: 13N

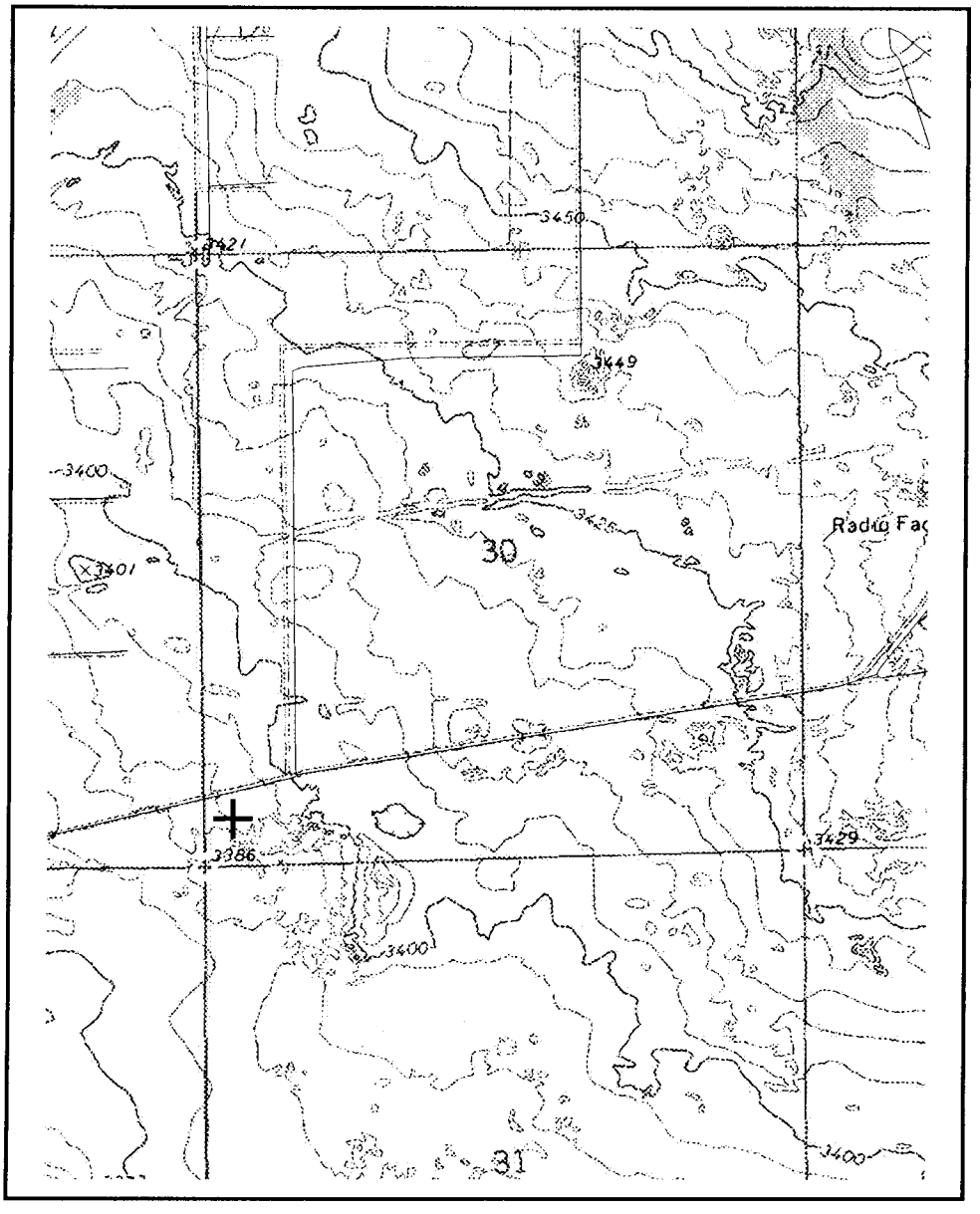
NAD 1983(92) (Meters)	N: 3,591,197	E: 677,925
NAD 1983(92) (Survey Feet)	N: 11,782,118	E: 2,224,160
NAD 1927 (Meters)	N: 3,591,021	E: 677,885
NAD 1927 (Survey Feet)	N: 11,781,542	E: 2,224,027

State Plane Coordinate System Zone: New Mexico East

NAD 1983(92) (Meters)	N: 160,729	E: 280,286
NAD 1983(92) (Survey Feet)	N: 527,326	E: 919,571
NAD 1927 (Meters)	N: 160,738	E: 267,644
NAD 1927 (Survey Feet)	N: 527,354	E: 878,097

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: CP Scale: 1:20,224

Northing/Easting: UTM83(92) (Meter): N: 3,591,197 E: 677,925

Northing/Easting: SPCS83(92) (Feet): N: 527,326 E: 919,571

GW Basin: Capitan

Print Date: 04/02/2009

ATTACHMENT B

DOCUMENTATION OF NM811 UNDERGROUND UTILITY CLEARANCE

NM811 LOCATE REQUEST

TICKET NUMBER:	18FE270504	Update of:	
Ticket Type:	Standard Locate		
Creation Date:	02/27/18 AT 12:24		

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:	5058676990	Alternate Contact:	Don Gray
Company Fax:		Alternate Contact Phone:	505-401-8628
Main Contact:	Clay Kilmer	Alternate Contact Email:	dgray@team-psc.com

Work Information

State:	NM	Work To Begin:	03/01/18 AT 12:15
County:	LEA	Expire Date	03/15/18 AT 12:15
Place:	RURAL LEA		
Address:	S Wallach LN		
Intersection:	NM-18		
Latitude:	32.442063	Longitude:	-103.105377
Secondary Lat:	32.449028	Secondary Long:	-103.090572
Work Type:	Bore-Auger - Water Well	Working For:	Sundance West
Pre-marked:	YES	Mechanical Boring:	NO
Contact Prior to Locating:	NO	Contact After Locating:	YES

Location Information (Driving Directions)

From the inter of NM-18 & Wallach Ln, drive east on Wallach Lane 2.1 miles.

Location Information (Spotting Instructions)

Exact locations where wells are to be drilled are marked with stakes and white flagging. Please spot any UG utilities within 10 feet of well locations

Location Information (Remarks)

8 monitoring well locations are staked with white flagging at the following coordinates: 103D 06M 10.1S; 32D 26M 53.3S 103D 06M 10.1S; 32D 26M 45.3S 103D 05M 28.2S; 32D 26M 38.29S 103D 05M 47.8S; 32D 26M 35.34S 103D 05M 33.13S; 32D 26M35.3S 103D 05M 58.7S; 32D 26M 35.21S 103D 06M 3.9S; 32D 26M 35.2S 103D 06M 9.8S; 32D 26M 35.3S No Hazards - Open Access

TRSQ: [W8T21SR38ES30SE] [W8T21SR38ES30SW] [W8T21SR38ES31NE] [W8T21SR38ES31NW]

Utilities Notified:

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

Response Status As Of Wednesday, May 16, 2018 1:15 PM

Status	Code	Name	Facilities
Closed	COEUN	CITY OF EUNICE • **March 01, 2018 12:26 PM by AutoClose**: No Response Provided Closed by the system process for excessive age.	Water, Waste Water - Sewer
Closed	TCO2	TRINITY PIPELINE GP LLC • **February 27, 2018 1:42 PM by onecall@trinityco2.com**: UFO Cleared Trinity CO2 is approx. 150' due east of easternmost GPS.	Pipeline
Closed	WNDSTRM	WINDSTREAM COMMUNICATIONS • **February 27, 2018 4:59 PM by NMKORTERRA**: UFO Cleared	Phone
Closed	XCEH	XCEL- HOBBS SERVICE CENTER	Electric

- **February 27, 2018 3:40 PM by USICLLC**: UFO Cleared

ATTACHMENT C

LITHOLOGIC LOGS AND CONSTRUCTION DETAILS, VADOSE ZONE WELLS

GORDON ENVIRONMENTAL PSC
333 Rio Rancho Blvd. NE,
Suite 400
Rio Rancho, NM 87124
P: 505.867.6990
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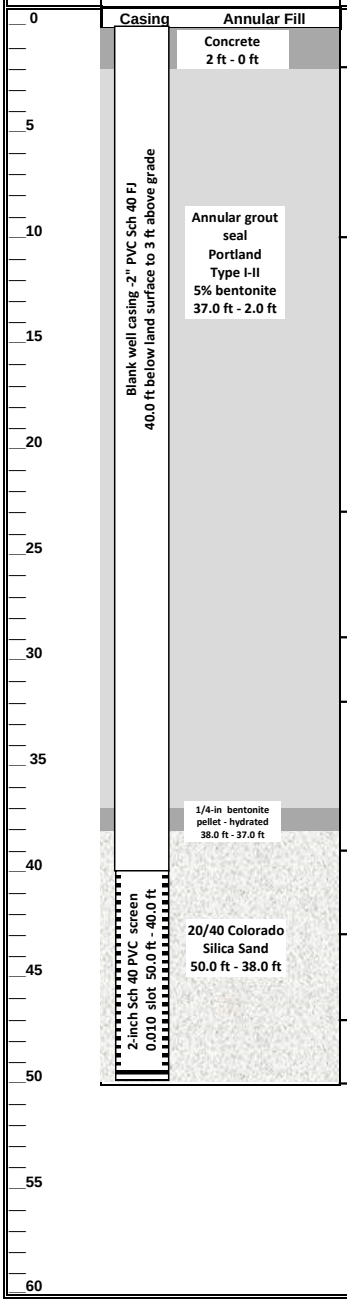
MONITORING WELL LOG

Well Name: Monitoring Well VZ-2

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 53.3" N, 103°, 06', 10.1" W	**Drilled Depth:**	50 ft
L.S. Elevation (feet):		**Cased Depth:**	50 ft
Drill Date	3/7/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-2) CP-1694 POD1
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
Soil, sandy loam, 95% sand, 5% fines, orange, 5YR 5/6, fine grained, friable, non-plastic, dry	SW
Sand, fine to medium, 75% sand, 25% fines, silty, 2.5YR 4/8, firm, low plasticity, slightly moist	SM
Caliche, silty, pink-white, 85% sand, 15% fines, 2.5YR 8/2, hard, non-plastic, dry	SM
Sand, Silty, fine to medium, 75% sand, 25% fines, yellowish-white, 10YR 8/2, minor gravel, up to 1/3 inch, quartzite (MARL?), hard, non-plastic, dry	SM
Sand, AA. Gravel up to 1 inch, 75% sand, 25% fines, pink-white 5YR 8/2, hard, non-plastic, dry	SM
Sand, fine toned, silty, pink, 75% sand, 25% fines, 5YR 8/3, minor gravel 1/8" sub-rounded, quartzite, soft, non-plastic, dry	SM
Gravel, fine to 1/2", sandy, silty, pink-yellow, 7.5YR 7/4, 60% gravel, 30% sand, 10% fines, firm, non-plastic, dry	GM
Sand, fine to medium, silty, orange, 2.5YR 5/8, 80% sand, 20% fines, firm, low-plasticity, slight moisture	SM
Shale, clayey, variegated red/green, 2.5YR 3/6 to 10YR 5/2, hard, high plasticity, dry, 2.5 YR 4/1 to 10 YR 8/1 7.5R 4/1 to 10GY 8/1 Total Depth Drilled: 50 ft Well dry at total depth	

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MONITORING WELL LOG

Well Name: Monitoring Well VZ-3

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 45.35" N, 103°, 06', 10.15" W	**Drilled Depth:**	45 ft
L.S. Elevation (feet):		**Cased Depth:**	45 ft
Drill Date	3/6/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-3) CP-1694 POD 2
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details	Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
0	Casing / Annular Fill		
	Concrete 2 ft - 0 ft		
5		Soil, sandy, well sorted, 95% sand, 5% fines, orange, 5YR 6/6, fine grained, friable, non-plastic, dry	SW
			SC
	Annular grout seal Portland Type I-II 5% bentonite 32.0 ft - 0.0 ft	Sand, fine to medium, 70% sand, 30% fines, silty, 5YR 6/6, firm, medium plasticity, moist	
10		Sand, with caliche, 75% sand, 25% fines, hard, buff to white, 2.5YR 8/2, firm, low placticity, moist	SM
		Sand, silty, red, 5YR 5/6, 75% sand, 25% fines, firm, low plasticity, moist	SM
15	Blank well casing -2" PVC Sch 40 FJ 35.0 ft below land surface to 3 ft above grade		
20		Caliche, sand, fine to medium grained, buff-pink, 5YR 8/3, 80% sand, 20% fines, firm, non-plastic, dry	SM
25		Caliche as above, fine to medium gravel, mixed igneous, 80% sand, 20% fines, hard, non-plastic, dry	SM
30		Sand, fine, caliche cement, pink-buff, 5YR 8/3, 75% sand, 25% fines, friable non-plastic, dry	SM
	1/4-in bentonite pellet - hydrated 33.0 ft - 32.0 ft		
35	2-inch Sch 40 PVC screen 0.010 slot 46.0 ft - 36.0 ft	Sand, fine, silty, orange, 5 YR 7/8, 80% sand, 20% fines, friable non-plastic, dry Drilling hard, redbed clasts	SM
	20/40 Colorado Silica Sand 45.0 ft - 33.0 ft		
40			
		Shale, sandy, maroon, 2.5YR 3/6, hard, 25% sand, 75% fines, NP, dry	
45		Total Depth Drilled: 45 ft Well dry at total depth	
50			
55			
60			

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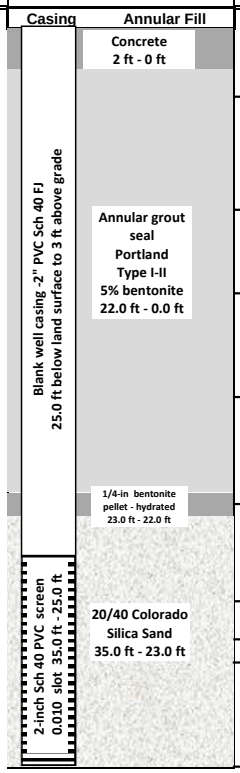
MONITORING WELL LOG

Well Name: Monitoring Well VZ-5

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 38.29" N, 103°, 05', 28.2" W	**Drilled Depth:**	35 ft
L.S. Elevation (feet):		**Cased Depth:**	35 ft
Drill Date	3/7/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-5) CP-1694 POD 3
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Depth (ft) Below Land Surface	Lithologic Descriptions (Drill notes, moisture content, water-bearing properties, etc.)	Unified Soil Classification System Symbol
0	Soil, sandy loam, brown, 5YR 7/4, 95% sand, 5% fines, friable, non-plastic, dry	SW
5	Sand, fine, silty, orange, 5YR 7/4, 95% sand, 5% fines, friable, non-plastic	SW
10	Caliche, bound sand, orange as above, 80% sand, 20% fines, firm, non-plastic, dry	SM
15	Sand, fine to medium grained, silty, pink, 5YR 8/4, less caliche cement 85% sand, 15% fines, firm, non-plastic, dry	SM
20	Sand, fine, silty, light pink, minor gravel to pebbles, 5YR 8/2, 85% sand, 15% fines, firm, non-plastic	SM
25	Sand, A.A., darker pink, 2.5 YR 7/6, 85% sand, 15% fines, friable, non-plastic, dry	SM
30	Sand, silty, pebbly, mottled green to orange caliche in vertical fractures, 85% sand, 15% fines firm, low plasticity, slightly moist Shale, fractured, weathered, red to green	SM
35	Shale, red, clayey, sandy, 7.5 YR 4/4 Total Depth Drilled: 35 ft Well dry at total depth	
40		
45		
50		
55		
60		

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MONITORING WELL LOG

Well Name: Monitoring Well VZ-6

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84)	32°, 26', 34.7" N, 103°, 05', 50.8" W	**Drilled Depth:**	45 ft
L.S. Elevation (feet):		**Cased Depth:**	45 ft
Drill Date	4/5/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-6) CP-1694 POD 4
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		

Depth (ft) Below Land Surface	WELL Completion Details	Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
0	Casing / Annular Fill Concrete 2 ft - 0 ft	Soil, sandy loam, orange brown, 5YR 6/4, 85% sand, 15% fines, friable, non-plastic, dry	SM
5	Blank well casing -2" PVC Sch 40 FJ 35.0 ft below land surface to 3 ft above grade		
10	Annular grout seal Portland Type I-II 5% bentonite 32.0 ft - 0.0 ft	Sand, silty, minor gravel, mottled orange to grey, 5YR 6/6 to 5YR 7/1, chaliche in vertical joints and laminae 80% sand, 20% fines, firm, low plasticity, slightly moist	SM
15			
20		Sand, fine, orange, 7.5YR 6/6, with caliche laminae, 90% sand, 10% fines, friable, non-plastic, dry	SP-SM
25		Caliche, sand, fine, silty, pink-white, 5YR 8/1, 80% sand, 20% fines, friable, non-plastic, dry	SM
30		Sand, fine, silty, mottled orange to green, 7.5YR 7/4 to 2.5 GY 8/0, 80% sand, 20% fines, non-plastic, dry	SM
35	1/4-in bentonite pellet - hydrated 33.0 ft - 32.0 ft 2-inch Sch 40 PVC screen 0.010 slot 45.0 ft - 35.0 ft	Sand, fine, silty, orange-brown, 7.5 YR 7/4, gravel up to 1/6-in, subrounded igneous mixed (quartzite) 15% gravel, 80% sand, 5% fines, hard, non-plastic, dry	SM
40	20/40 Colorado Silica Sand 45.0 ft - 33.0 ft	Gravel, sandy, (gravel up to 1.25 in, well rounded, quartzite, red, 7.5 YR 4/1 50% gravel, 35% sand, 15% fines, non-plastic, dry	GP
45		Red bed, maroon shale, clayey with green laminae and spherical inclusions 5% sand, 95% fines, hard, high plasticity, slightly moist	
50		Total Depth Drilled: 45 ft Well dry at total depth	
55			
60			

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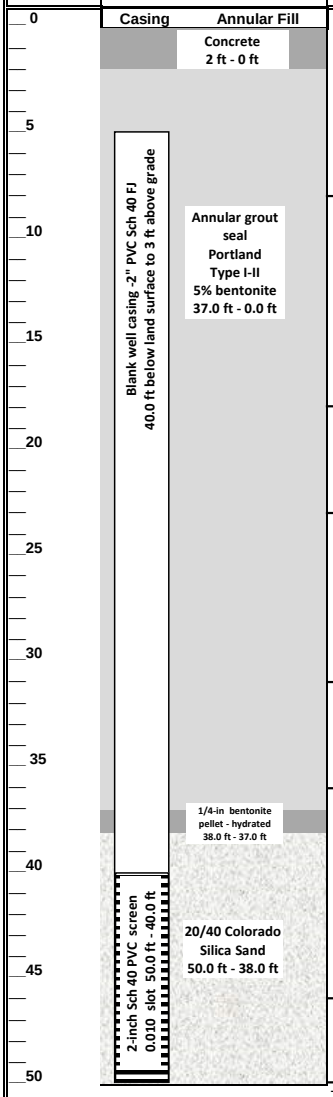
MONITORING WELL LOG

Well Name: Monitoring Well VZ-7

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 34.7" N, 103°, 05', 55.6" W	**Drilled Depth:**	50 ft
L.S. Elevation (feet):		**Cased Depth:**	50 ft
Drill Date	4/4/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-7) CP-1694 POD 5
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
Soil, sandy loam, brown, 5YR 5/1, 95% sand, 5% fines, friable, non-plastic, dry	SP
Sand, silty, orange, 5YR 5/6, 85% sand, 15% fines, firm, low plasticity, slightly moist Gravelly from 13' to 15', (up to 1/4 in diameter, subrounded, mixed igneous)	SM
Sand, as above, white caliche in vertical joints, orange to greyish white, 5YR 7/6 to 10YR 8/1	SP-SM
Caliche, sandy, grayish white, 10YR 8/1, 90% sand, 10% fines, firm, non-plastic, dry	SP-SM
Caliche, sand, laminated, pink, 5YR 8/2, 85% sand, 15% fines, firm, non-plastic, dry	SM
Gravel, fine to medium, up to 1/2 in, subrounded, mixed igneous lithology, red, 10R 5/6 50% gravel, 30% sand, 20% fines, hard, non-plastic, dry	GM
Chinle siltstone, sandy, micaceous, variegated maroon to green, 10R 4/3 to 5G 7/1	
Total Depth Drilled 50 ft Well dry at total depth	

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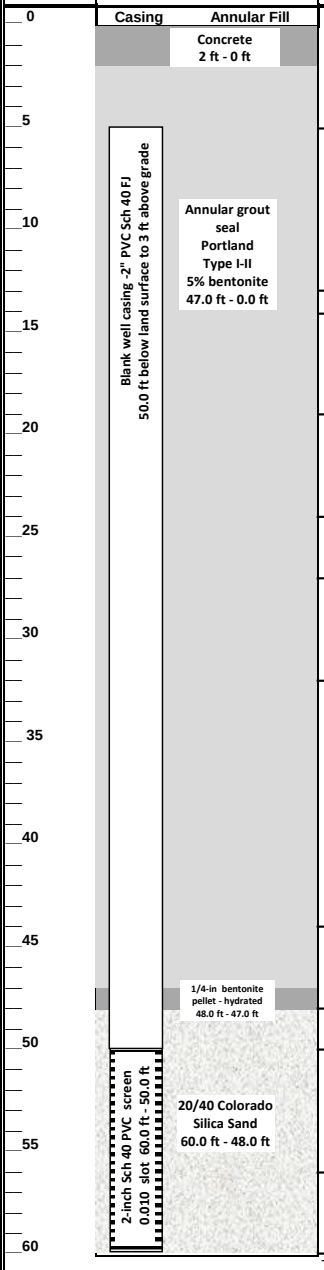
MONITORING WELL LOG

Well Name: Monitoring Well VZ-8

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 34.95" N, 103°, 05', 58.8" W	**Drilled Depth:**	60 ft
L.S. Elevation (feet):		**Cased Depth:**	60 ft
Drill Date	3/8/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-8) CP-1694 POD 6
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
Sand, silty, fine to medium, brown, 7.5 YR 8/6, 90% sand, 10% fines, friable, non-plastic, dry	SW-SM
Sand, fine, silty, orange, 10R 5/8, 85% sand, 15% fines, firm, low plasticity, slightly moist	SM
Gravel, sandy, up to 3/8 in, rounded, pink, 2.5 YR 7/4, 45% gravel, 40% sand, 15% fines, hard, NP, dry	GM
Caliche, sandy, fine to medium, white, 5YR 8/2, 85% sand, 15% fines, friable, non-plastic, dry	SM
Sand, fine, silty, buff, 5YR 7/6, 85% sand, 15% fines, friable, non-plastic, dry	SM
Caliche, fine silty sand, white, 7.5 YR 8/2, 80% sand, 20% fines, friable, non-plastic, dry	SM
Caliche, fine, sand, silty, reddish pink, 2.5 YR 7/6, 80% sand, 20% fines, firm, non-plastic, dry	SM
Gravel, coarse, up to 2 in, well rounded, sandy, silty, red-brown, 2.5 YR 6/6 65% gravel, 20% sand, 15% fines, hard, non-plastic, dry	GM
Sand, caliche, clasts of light green limestone, enmarl, fine grained maroon sandstone 25% gravel, 60% sand, 15% fines, hard, non-plastic, dry	SM
Sand, fine, silty, red, 5YR 5/6	
Sand, gravelly, caliche, green limestone clasts, 10% gravel, 75% sand, 15% fines, hard, non-plastic, dry	SM
Sandstone, fine, silty, clayey, maroon, 2.5 YR 2.5/4, micaceous 70% sand, 30% fines, hard, non-plastic, dry	
Total Depth Drilled 60 ft Well dry at total depth	

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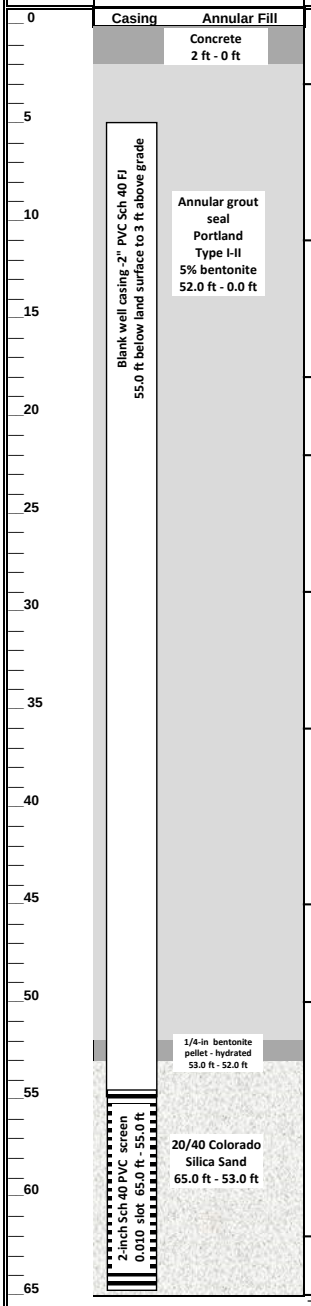
MONITORING WELL LOG

Well Name: Monitoring Well VZ-9

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 35.2" N, 103°, 06', 3.86" W	**Drilled Depth:**	65 ft
L.S. Elevation (feet):		**Cased Depth:**	65 ft
Drill Date	4/3/18 to 4/4/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-9) CP-1694 POD 7
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
Soil, sandy, loam, brown, 5YR 5/2, 95% sand, 5% fines, friable, non-plastic, dry	SP
Sand, fine to medium grained, orange, 7.5 YR 7/8, 95% sand, 5% fines, friable, non-plastic, dry	SP
Sand, fine, light orange, 5YR 7/6, 95% sand, 5% fine, friable, low plasticity, slightly moisty	SP
Sand, silty, fine, mottled orange to green-white, caliche cement 90% sand, 10% fines, firm, non-plastic, dry	SP-SM
Caliche, bound sand, silty, 85% sand, 15% fines, hard, non-plastic, dry	SM
Sand, fine, silty, very light pink, 10YR 8/2, carbonate cement 80% sand, 20% fines, firm, non-plastic, dry	SM
Sand, fine, silty, mottled red-white (caliche), 2.5 in green quartzite cobble at 45' 80% sand, 20% fines, firm, low plasticity, dry	SM
Gravel, sandy, up to 1 in, mixed igneous, 45% gravel, 35% sand, 20% fines, hard, non-plastic, dry	GM
Sand, fine to medium, silty, red 10R 5/4, with gravelly zones, 85% sand, 15% fines, hard, non-plastic, dry	SM
Transitioning to 20% sand, 80% fines, hard, low plasticity, dry	
Shale, silty, clayey (Chinle), variegated red-green, Variegated red-green, 2.5 YR 5/4 to 5G 7/1, micaceous	
Total Depth Drilled 65 ft Well dry at total depth	

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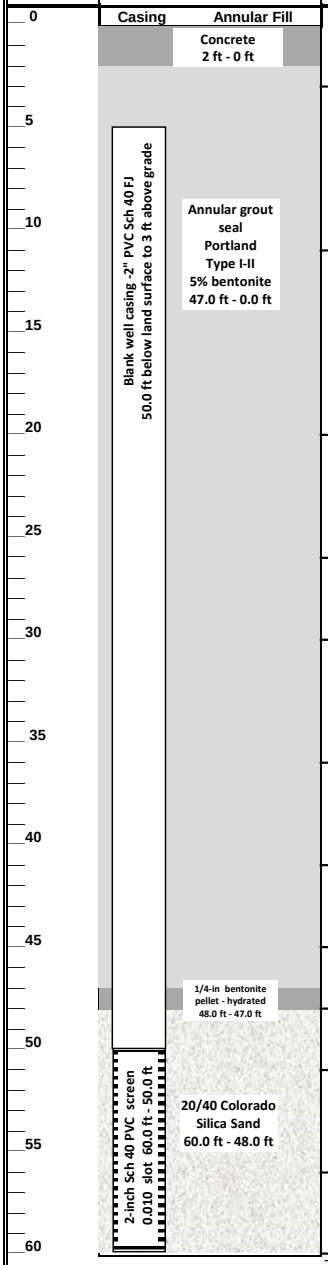
MONITORING WELL LOG

Well Name: Monitoring Well VZ-10

Site Name:	Sundance West Services Site Closure	**Sampling Method:**	Auger Cuttings - 3-inch x 5 ft lead auger split spoon core barrel
Well Location (WGS-84	32°, 26', 34.8" N, 103°, 06', 10" W	**Drilled Depth:**	60 ft
L.S. Elevation (feet):		**Cased Depth:**	60 ft
Drill Date	4/2/18	**Drilling Contractor:**	Talon LPE, Amarillo Texas
Logged By:	Clay Kilmer	**OSE POD NO. (Well No.):**	(VZ-10) CP-1694 POD 8
Drilling Method:	Hollow-Stem Auger (HSA)		
Hole Diameter:	7 7/8-inch		
Project Number:	Gordon|PSC Project No.: 1011717.00-0001		



Lithologic Descriptions Drill notes, moisture content, water-bearing properties, etc.	Unified Soil Classification System Symbol
Soil, sandy loam, brown, 7.5 YR 6/3, 95% sand, 5% fines, friable, non-plastic, dry	SP
Sand, well sorted, orange, 7.5YR 7/8, 95% sand, 5% fines, friable, non-plastic, dry	SW
Sand, silty, yellow orange, 10YR 6/6, caliche in vertical joints, 14'-20' 85% sand, 15% fines, firm, low plasticity, slightly moist	SM
Sand, fine, silty, yellow-orange, 10YR 7/6, caliche in horizontial laminae 85% sand, 15% fines, firm, non-plastic, dry	SM
Caliche, sand, fine, white-pink, 10YR 8/8, 80% sand, 20% fines, firm, non-plastic, dry	SM
Caliche as above, harder, well cemented, 80% sand, 20% fines, hard, non-plastic, dry	SM
Caliche, sandy, gravelly (subrounded, up to 1/2 in, quartz), pale orange, 5YR 8/3 25% gravel, 55% sand, 20% fines, hard, non-plastic, dry	SM
Gravel, coarse (up to 1.5 in, mixed igneous), 75% gravel, 15% sand, 10% fines, hard, non-plastic, dry	GP-GM
Clayey shale inclusions in lower (red) pink, 2.5 YR 7/4 Gravel, coarse, sandy, (up to 1/2 in, rounded), maroon, 7.5R 4/1 75% gravel, 15% sand, 10% fines, hard, non-plastic, dry	GP-GM
Sand, medium to fine, red, 10R 4/4, 85% sand, 15% fines, hard, non-plastic, slightly moist	SM
Sand, as above, with minor gravel (up to 1/2 in, well rounded) 10% sand, 80% gravel, 10% fines, hard, non-plastic, dry	SP-SM
Sandstone, weathered, maroon, 10R 5/4, (Dockum), 95% sand, 5% fines, hard, non-plastic, dry	
Total Depth Drilled 60 ft Well dry at total depth	

ATTACHMENT D

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

Photo 1.—Core samples from well VZ-2

Photo 2.—Core samples from well VZ-3

Photo 3.—Core samples from well VZ-5

Photo 4.—Core samples from well VZ-6

Photo 5.—Core samples from well VZ-7

Photo 6.—Core samples from well VZ-8

Photo 7.—Core samples from well VZ-9

Photo 8.—Core samples from well VZ-10

Photo 9.—Hollow stem auger drill equipment and crew

Photo 10.—Blank well casing

Photo 11.—Well screen

Photo 12.—Well bottom cap

Photo 13.—Well top plug

Photo 14.—Annular gravel pack

Photo 15.—Bentonite pellet annular seal

Photo 16.—Well grout

Photo 17.—Surface concrete mix

Photo 18.—Well gravel packing

Photo 19.—Well grouting

Photo 20.—Well grouting 2

Photo 21.—Completed well VZ-2

Photo 22.—Completed well VZ-3

Photo 23.—Completed well VZ-5

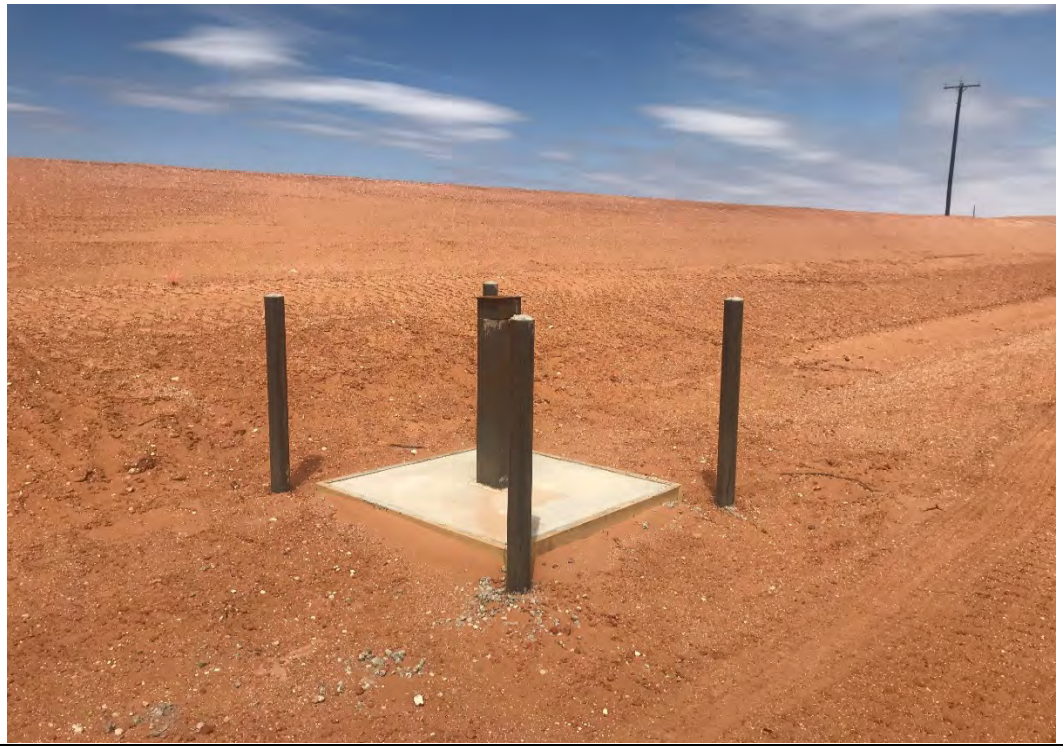


Photo 24.—Completed well VZ-6

Photo 25.—Completed well VZ-7

Photo 26.—Completed well VZ-8

Photo 27.—Completed well VZ-9

Photo 28.—Completed well VZ-10

ATTACHMENT E

NMOSE WELL RECORDS FOR VADOSE ZONE WELLS

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER AMENDED

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
VZ-1	CP 1016
WELL OWNER NAME(S)	**PHONE (OPTIONAL)**
Sundance Services, Inc.; Contact Mr. Joe Carrillo, Plant Manager	545-394-2511
WELL OWNER MAILING ADDRESS	**CITY / STATE / ZIP**
1001 6th Street	Eunice / NM / 88231

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	59.50	N
	LONGITUDE	103	5	28.60	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
NE ¼	NE ¼	NE ¼	SE ¼	30	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)
4/19/09	4/19/09	28	150	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	23	7.25	PVC casing	Flush thread joint	2	Sch 40 PVC	
23	28	7.25	PVC screen	Flush thread joint	2	Sch 40 PVC	0.010

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)
13	27	14	Sand; v. fine to fine; lt. tan	
27	28	1	Claystone to siltstone; dry	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: N/A

TOTAL ESTIMATED WELL YIELD (GPM): N/A

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2009 JUL -6 A 11:45

L 02337

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

FILE NUMBER	CP-1016	POD NUMBER		TRN NUMBER	~~428017~~
LOCATION	21.38.30.4222				PAGE 1 OF 2

Monitor

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	19	7.25	Cement/bentointe	4.9	Tremie
	19	21	7.25	Bentonite pellets	.5	Tremie
	21	28	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	8	8	Sand; v. fine to fine; med. rust/tan; dry to s. moist	☐ YES ☐ NO
8	13	5	Caliche; white to light tan	☐ YES ☐ NO
13	27	14	Sand; v. fine to fine; lt. tan	☐ YES ☐ NO
27	28	1	Claystone to siltstone; dry	☐ 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:

MP-2.

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 JR — SIGNATURE OF DRILLER

05/20/09 — DATE

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

FILE NUMBER	CP-1016	POD NUMBER		TRN NUMBER	~~428017~~
LOCATION	21.38.30.4222				PAGE 2 OF 2

Monitor

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER AMENDED

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

POD NUMBER (WELL NUMBER)	OSE FILE NUMBER(S)
VZ-4	CP 1018
WELL OWNER NAME(S)	**PHONE (OPTIONAL)**
Sundance Services, Inc.; Contact: Mr. Joe Carrillo, Plant Manager	575-394-2511
WELL OWNER MAILING ADDRESS	**CITY / STATE / ZIP**
1001 6th Street	Eunice / NM / 88231

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
LATITUDE	32	26	37.40	N
LONGITUDE	103	6	26.20	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
NW ¼	SW ¼	SW ¼	SW ¼	30	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)
4/24/09	4/24/09	60	150	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	50	10.75	PVC casing	Flush thread joint	2	Sch 40 PVC	
50	60	10.75	PVC screen	Flush thread joint	2	Sch 40 PVC	0.010

STATE ENGINEER OFFICE ROSWELL, NEW MEXICO 2009 JUL -6 A 11:45

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)
45	60	15	Claystone to siltstone; dry	

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

L 02342

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

FILE NUMBER CP-1018	POD NUMBER	TRN NUMBER 128022
LOCATION 21.38.30.3331		PAGE 1 OF 2

Monitor

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	46	10.75	Cement/bentonite	27.5	Tremie
	46	48	10.75	Bentonite pellets	1.2	Tremie
	48	60	10.75	silica sand	7.2	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	45	45	Sand; silty v. fine to fine; lt. buff to pinkish tan; dry	☐ YES ☐ NO
45	150	105	Claystone to siltstone; dry	☐ 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:

MP-4.
Test bore grouted back to ground level and a 2-in. monitor well constructed adjacent

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 III — SIGNATURE OF DRILLER

07/02/09 — DATE

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

FILE NUMBER	CP-1018	POD NUMBER		TRN NUMBER	428022
LOCATION	21.38.30.3331				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).
(VZ-2) CP-1694 POD 1		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	53.3	N
	LONGITUDE	103	06	10.1	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3-7-18	3-7-18	50	50	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	40	7 7/8	PVC	Flush Joint	2	Schedule 40	blank
40	50	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	37	7 7/8	Grout, portland neat cement with 5% bentonite powder	11.1	tremmied
37	38	7 7/8	1/4 inch bentonite pellets	0.3	poured
38	50	7 7/8	20/40 grade silica sand	3.6	poured

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		Soil, Sandy, Non-plastic, Dry, Orange, 5YR 5/6, Fine grained	Y ✓N	
3	10		Sand, Fine to Med, Silty, Moist, 2.5YR 4/8	Y ✓N	
10	23		Caliche (sand), Silty, Non-plastic, Dry, Pink-white, 2.5YR 8/2	Y ✓N	
23	29		Sand, Solty, Fine to Med, Non-plastic, Dry, Minor gravel, up to 1/3", Yellowish-	Y ✓N	
29	32		Sand, Gravel up to 1", Non-plastic, Dry, Pink-white, 5YR 8/2	Y ✓N	
32	39		Sand, Fine toned, Silty, Minor gravel 1/8 sub-rounded, Non-plastic, Dry, Pink 5Y	Y ✓N	
39	43		Gravel, Fine to 1/2", Sandy, Silty, Non-plastic, Dry, Pink-yellow, 7.5YR 7/4	Y ✓N	
43	47		Sand, Fine to Med, Silty, Orange, 2.5YR 5/8	Y ✓N	
47	50		Clayey, Moist, Red/green, 2.5YR 3/6	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:

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

Ronnie Rodriguez

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:

Shane Currie — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

5/22/2018 — 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).
(VZ-3) CP-1694 POD 2		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	45.35	N
	LONGITUDE	103	06	10.15	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3-6-18	3-6-18	45	45	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	35	7 7/8	PVC	Flush Joint	2	Schedule 40	blank
35	45	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	32	7 7/8	Grout, portland neat cement with 5% bentonite powder	9.6	tremmied
32	33	7 7/8	1/4 inch bentonite pellets	0.3	poured
33	45	7 7/8	20/40 grade silica sand	3.6	poured

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	8		Soil, Sandy, Fine, Well sorted, Friable, Non-plastic, Dry, Orange, 5YR 6/6	Y ✓N	
8	10		Sand, Fine to Med, Silty, Stiff, Moist, Orange 5YR 6/6	Y ✓N	
10	12		Sand with caliche, Hard, Moist, buff to white, 2.5YR 8/2	Y ✓N	
12	14		Sand, Silty, Moist, Red 5YR 5/6	Y ✓N	
14	25		Caliche, Sand, Fine to Med, Non-plastic, Dry, buff-pink, 5YR 8/3	Y ✓N	
25	29		Caliche, AA, Minor fine to med gravel, Mixed, Non-plastic, Dry	Y ✓N	
29	32		Sand fine, Caliche, Non-plastic, Dry, pink-buff, 5YR 8/3	Y ✓N	
32	41		Sand, Fine, Non-plastic, Dry, Orange, 5YR 7/8	Y ✓N	
41	45		Sandy, Non-plastic, Dry, Maroon, 2.5YR 3/6, Hard	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:

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

Ronnie Rodriguez

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:

Shane Currie — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

5/22/2018 — 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

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1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
(VZ-5) CP-1694 POD 3		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	38.29	N
	LONGITUDE	103	05	28.2	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3-7-18	3-7-18	35	35	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	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	22	7 7/8	Grout, portland neat cement with 5% bentonite powder	6.6	tremmied
22	23	7 7/8	1/4 inch bentonite pellets	0.3	poured
23	35	7 7/8	20/40 grade silica sand	3.6	poured

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		Soil, Sandy, Non-plastic, Dry, Brown, 5YR 7/4	Y ✓ N	
3	9		Sand, Fine, Silty, Non-plastic, Dry, Orange, 5YR 6/8	Y ✓ N	
9	13		Caliche sand, Non-plastic, Dry, Orange	Y ✓ N	
13	18		Sand, Fine to med, Silty Non-plastic, Dry, Pink, 5YR 8/4, Less caliche cement	Y ✓ N	
18	23		Sand, Fine, Silty, Gravel to pebbles, Non-plastic, Dry, Light pink, 5YR 8/2	Y ✓ N	
23	28		Sand, Non-plastic, Dry, A.A darker pink, 2.5YR 7/6	Y ✓ N	
28	30		Sand, Silty, Pebbly, Moist, Green 10YR 5/2 to orange 2.5YR 4/8, Caliche in vert	Y ✓ N	
30	32		29' shale, weathered, Moist, Red to green	Y ✓ N	
32	35		30-shale, Moist, Clayey, Sandy, red 7.5YR 4/4	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:

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

Ronnie Rodriguez

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:

Shane Currie — 5/22/2018

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).
(VZ-6) CP-1694 POD 4		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	34.7	N
	LONGITUDE	103	05	50.8	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4-5-18	4-5-18	45	45	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	35	7 7/8	PVC	Flush Joint	2	Schedule 40	blank
35	45	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	32	7 7/8	Grout, portland neat cement with 5% bentonite powder	9.6	tremmied
32	33	7 7/8	1/4 inch bentonite pellets	0.3	poured
33	45	7 7/8	20/40 grade silica sand	3.6	poured

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	4		Soil, Sandy, Non-plastic, Dry, Orange-brown, 5YR 6/4	Y ✓N	
4	15		Sand, Silty, Minor gravel, Orange to gray 5YR 6/6 to 5YR 7/1, Caliche	Y ✓N	
15	23		Sand, Fine, Non-plastic, Dry, Orange 7.5YR 6/6, with caliche laminae	Y ✓N	
23	28		Caliche, Sand, Fine, Silty, Non-plastic, Dry, Pink-white 5YR 8/1	Y ✓N	
28	33		Sand, Fine, Silty, Non-plastic, Dry, Orange to green 7.5YR 7/4 to 2.5GY 8/0	Y ✓N	
33	37		Sand, Fine, Silty, Non-plastic, Dry, Orange-brown, 7.5YR 7/4, Gravel up to 1/4"	Y ✓N	
37	42		Gravel, Sandy (gravel up to 1.25"), Well rounded, Non-plastic, Dry, Red 7/5YR	Y ✓N	
42	45		Red bed, Maroon shale, Clayey with green laminae & spherical inclusions	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:

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

Ronnie Rodriguez

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:

Shane Currie — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

5/22/2018 — 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).
(VZ-7) CP-1694 POD 5		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	34.7	N
	LONGITUDE	103	05	55.6	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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4-4-18	4-4-18	50	50	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	40	7 7/8	PVC	Flush Joint	2	Schedule 40	blank
40	50	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	37	7 7/8	Grout, portland neat cement with 5% bentonite powder	11.1	tremmied
37	38	7 7/8	1/4 inch bentonite pellets	0.3	poured
38	50	7 7/8	20/40 grade silica sand	3.6	poured

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	8		Soil, Sandy, Lean, Non-plastic, Dry, Brown 5YR 5/1	Y ✓N	
8	18		Sand, Silty, Moist, Orange 5YR 5/6, Gravely, 13'15' (up to 1/4", sub-rounded)	Y ✓N	
18	23		Sand, As above, with caliche in vertical joints, Non-plastic, Dry, Orange to grayi	Y ✓N	
23	31		Caliche, Sandy, Non-plastic, Dry, Grayish-white 10YR 8/1	Y ✓N	
31	36		Caliche, Sand, Laminated, Non-plastic, Dry, Pink 5YR 8/2	Y ✓N	
36	45		Gravel, Fine, up to 1/2", Sub-rounded, Non-plastic, Dry, Red 10YR 5/6	Y ✓N	
45	50		Siltstone, Sandy, Moist, Maroon to green 10YR 4/3 to 5G 7/1	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:

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

Ronnie Rodriguez

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:

Shane Currie — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

5/22/2018 — 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).
(VZ-8) CP-1694 POD 6		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	34.95	N
	LONGITUDE	103	05	58.8	W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
3-8-18	3-8-18	60	60	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	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	47	7 7/8	Grout, portland neat cement with 5% bentonite powder	14.1	tremmied
47	48	7 7/8	1/4 inch bentonite pellets	0.3	poured
48	60	7 7/8	20/40 grade silica sand	3.6	poured

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	5		Sand, Silty, Fine to Med, Non-plastic, Dry, Brown 7.YR 8/6	Y ✓N	
5	13		Sand, Fine, Silty, Moist, Orange, 10YR 5/8	Y ✓N	
13	15		Gravel, Sandy, Up to 3/8", Rounded, Non-plastic, Dry, Pink, 2.5YR 7/4	Y ✓N	
15	19		Caliche, Sandy, Fine to Med, Non-plastic, Dry, White 5YR 8/2	Y ✓N	
19	24		Sand, Fine, Silty, Non-plastic, Dry, Buff, 5YR 7/6	Y ✓N	
24	28		Caliche, Fine, Silty, Sand, Non-plastic, Drry, White 7.5YR 8/2	Y ✓N	
28	32		Caliche, Fine, Silty, Non=plastic, Dry, Reddish-pink 2.5YR 7/6	Y ✓N	
32	45		Gravel, Coarse, up to 2", Well rounded, Sandy, Silty, Non-plastic, Dry, Red-brov	Y ✓N	
45	48		Sand, Caliche, Non-plastic, Dry, Clasts of lt. green limestones, Fine grained sand	Y ✓N	
48	50		Sand, Fine, Silty, Red 5YR 5/6	Y ✓N	
50	56		Sand, Gravelly, Caliche, Non-plastic, Dry, Green L.S. clasts	Y ✓N	
56	60		Sandstone, Fine, Silty, Clayey, Dry, Maroon 2.5YR 2.5/4	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:

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

Ronnie Rodriguez

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:

Shane Currin — 5/22/2018

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).
(VZ-9) CP-1694 POD 7		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	35.2	N
	LONGITUDE	103	06	3.86	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4-3-18	4-4-18	65	65	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	55	7 7/8	PVC	Flush Joint	2	Schedule 40	blank
55	65	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	3	7 7/8	Concrete, poured with surface apron at surface	0.9	poured
3	52	7 7/8	Grout, portland neat cement with 5% bentonite powder	14.7	tremmied
52	53	7 7/8	1/4 inch bentonite pellets	0.3	poured
53	65		20/40 grade silica sand	3.6	poured

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	4		Soil, Sandy, Loam, Non-plastic, Dry, Brown 5YR 5/2	Y ✓N	
4	11		Sand, Fine, Non-plastic, Dry, Orange, 7.5YR 7/8	Y ✓N	
11	18		Sand, Fine, Low-plasticity, Moist, Light orange 5YR 7/6	Y ✓N	
18	23		Sand, Silty, Fine, Non-plastic, Dry, Orange to green-white, Caliche cement	Y ✓N	
23	30		Caliche, Sand, Silty, Non-plastic, Dry	Y ✓N	
30	36		Sand, Fine, Silty, Non-plastic, Dry, Pink 10YR 8/2	Y ✓N	
36	45		Sand, Fine, Silty, Low-plasticity, Dry, Red-white (caliche), 2 1/2" green pebble	Y ✓N	
45	50		Gravel, Sandy, up to 1", Mixed igneous, Non-plastic, Dry	Y ✓N	
50	62		Sand, Fine to Med, Silty, Low-plasticity, Dry, Red 10YR 5/4 with gravely zones	Y ✓N	
62	65		Shale, Silty, Clayey, Green-red 2.5YR 5/ to 5G 7/1	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:

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

Ronnie Rodriguez

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:

Shane Currie — 5/22/2018

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

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1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
(VZ-10) CP-1694 POD8		

WELL OWNER NAME(S)	PHONE (OPTIONAL)
Sundance West Inc.	

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

WELL LOCATION (FROM GPS)		DEGREES	MINUTES	SECONDS	
	LATITUDE	32	26	34.8	N
	LONGITUDE	103	06	10	W

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

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

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER	NAME OF WELL DRILLING COMPANY
1575	Shane Currie	Talon/LPE

DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
4-2-18	4-2-18	60	60	Dry

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

DRILLING FLUID: ☐ AIR ☐ MUD ADDITIVES – SPECIFY:

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

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)
-3	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	47	7 7/8	Grout, portland neat cement with 5% bentonite powder	13.5	tremmied
47	48	7 7/8	1/4 inch bentonite pellets	0.3	poured
48	60		20/40 grade silica sand	3.6	poured

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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		Soil, Sandy loam, Non-plastic, Dry, Brown 7.5YR 6/3	Y ✓ N	
3	11		Sand, Non-plastic, Dry, Orange, 7.5YR 7/8	Y ✓ N	
11	20		Sand, Silty, Low-plasticity, Moist, Yellow-orange 10YR 6/2, Caliche in vertical	Y ✓ N	
20	26		Sand, Fine, Silty, Non-plastic, Dry, Yellow-orange 7/6, Caliche in horizontal lan	Y ✓ N	
26	30		Caliche, Sand, Fine, Non-plastic, Dry, White-pink 10YR 8/8	Y ✓ N	
30	36		Caliche, Hard, Well cemented, Non-plastic, Dry	Y ✓ N	
36	41		Caliche, Sandy, Gravely (sub-rounded, up to 1/2", quartz), Orange 5YR 8/3	Y ✓ N	
41	45		Gravel, Coarse (up to 1.5", mixed igneous), Non-plastic, Dry, Pink 2.5YR 7/4	Y ✓ N	
45	48		Grave, Coarse, Sandy (up to 1/2" rounded) Maroon 7.5YR 4/1	Y ✓ N	
48	51		Sand, Med to Fine, Non-plastic, Moist, Red 10YR 4/4	Y ✓ N	
51	56		Same as above, with more gravel (to 1/2" well rounded), Non-plastic, Dry	Y ✓ N	
56	60		Sandstone, Weathered, Non-plastic, Dry, Maroon 10YR 5/4	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:

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

Ronnie Rodriguez

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:

Shane Currie — SIGNATURE OF DRILLER / PRINT SIGNEE NAME

5/22/2018 — DATE

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