



STATE OF NEW MEXICO  
OFFICE OF THE STATE ENGINEER  
AZTEC

Tom Blaine, P.E.  
State Engineer

100 Gossett Drive, Suite A  
Aztec, New Mexico 87410

August 27, 2018

Andrea Felix  
Enduring Resources IV, LLC  
332 Road 3100  
Aztec, NM 87410

**RE: Permit Approval for Exploratory Well, SJ-4301 POD1; Notice of Intention Aquifer Testing; North Escavada Unit 2207-16B WSW, rural Sandoval County, New Mexico**

Dear Ms. Felix:

On July 11, 2018, and as subsequently amended, the New Mexico Office of the State Engineer received an application for a permit and an Artesian Plan of Operations from Enduring Resources IV, LLC (Enduring) for the drilling and testing of a proposed exploratory well at the above referenced location. The proposed exploratory well is associated with a concurrently filed Notice of Intention in which Enduring proposes to divert water pursuant to §§ 72-12-25 through -28, NMSA 1978. A receipt for the fees paid is also attached.

Enclosed is a copy of the above numbered permit that has been approved subject to the conditions set forth on the permit approval page, the approved Artesian Plan of Operations, and in the attached Permit Conditions of Approval. This permit authorizes the diversion of water solely for initial aquifer testing purposes. Prior to diversion of any water for the purposes stated in the associated Notice of Intention filing, additional modeling or interpretation of the initial test results will be necessary to confirm that the proposed diversion described in the NOI can take place. Authorization to divert water as proposed in the NOI may be subject to offsets if NMOSE determines that the proposed diversion would result in impairment or does not meet the requirements of §§ 72-12-25 through -28, NMSA 1978.

Please be aware that there are a number of permit conditions that apply to the drilling and completion of the proposed well. The approval conditions and the incorporated Artesian Plan of Operations (along with its requirements) are attached to the permit and should be reviewed thoroughly prior to proceeding to ensure they are clearly understood. As noted in Condition 14, please contact Blaine Watson at 505-334-4571 (or Doug Rappuhn at 505-383-4018) in advance to coordinate (including travel directions) the required casing, cementing, and pressure-testing inspections.

If you have any questions regarding this permitting action, please feel free to contact me at (505) 334-4571.

Sincerely,

Blaine Watson, P.G.  
District Manager  
Water Rights Division – District V

Enclosures

cc: Aztec Reading (w/o enclosures)  
SJ-4301 File  
WATERS



## OFFICE OF THE STATE ENGINEER/INTERSTATE STREAM COMMISSION - AZTEC OFFICE

OFFICIAL RECEIPT NUMBER: 5 - **6162** DATE: 7-18-18 FILE NO.: SJ-41301  
TOTAL: 25.00 RECEIVED: Twenty-Five DOLLARS ☒ CASH: X CHECK NO.: 3152  
PAYOR: Enduring Resources ADDRESS: 1050 17th St. Ste. 2500  
CITY: Denver STATE: CO ZIP: 80265 RECEIVED BY: MT

INSTRUCTIONS: Indicate the number of actions to the left of the appropriate type of filing. Complete the receipt information. **Original** to payor; **pink** copy to Program Support/ASD; **yellow** copy remains in district office; and **goldenrod** copy to accompany application being filed. If a mistake is made, void the original and all copies and submit to Program Support/ASD as part of the daily deposit.

**A. Ground Water Filing Fees**

1. Change of Ownership of Water Right	\$ 2.00
2. Application to Appropriate or Supplement Domestic 72-12-1 Well	\$ 125.00
3. Application to Repair or Deepen 72-12-1 Well	\$ 75.00
4. Application for Replacement 72-12-1 Well	\$ 75.00
5. Application to Change Purpose of Use 72-12-1 Well	\$ 75.00
6. Application for Stock Well/Temp. Use	\$ 5.00

**B. Surface Water Filing Fees**

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

**C. Well Driller Fees**

1. Application for Well Driller's License	\$ 50.00
2. Application for Renewal of Well Driller's License	\$ 50.00

**D. Reproduction of Documents**

@ 25¢/copy	\$
Map(s)	\$

**E. Certification**

	\$
--	----

**F. \*Credit Card Convenience Fee**

	\$
--	----

**G. Other**

	\$
--	----

**Comments:**

Filing fees for (5) exploratory wells  
POD 4-5

15. Application for Test, Expl. Observ. Well	\$ 5.00
16. Application for Extension of Time	\$ 25.00
17. Proof of Application to Beneficial Use	\$ 25.00
18. Notice of Intent to Appropriate	\$ 25.00

**All fees are non-refundable.**



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:	<input type="checkbox"/> Pollution Control And/Or Recovery	<input type="checkbox"/> Ground Source Heat Pump
<input checked="" type="checkbox"/> Exploratory Well (Pump test)	<input type="checkbox"/> Construction Site/Public Works Dewatering	<input type="checkbox"/> Other(Describe):
<input type="checkbox"/> Monitoring Well	<input type="checkbox"/> Mine Dewatering	

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

<input type="checkbox"/> Temporary Request - Requested Start Date:	Requested End Date:
--	---------------------

Plugging Plan of Operations Submitted? ☐ Yes ☒ No

2018 JUL 11 AM 10:41  
STATE ENGINEER OFFICE  
AZTEC, NEW MEXICO

1. APPLICANT(S)

Name: Enduring Resources IV, LLC	Name: Enduring Resources IV, LLC
Contact or Agent: check here if Agent <input type="checkbox"/> Andrea Felix	Contact or Agent: check here if Agent <input type="checkbox"/> John Conley
Mailing Address: 332 Road 3100	Mailing Address: 511 16th Street
City: Aztec	City: Denver
State: Zip Code: NM 87410	State: Zip Code: CO 80202
Phone: 505-386-8205 <input type="checkbox"/> Home <input checked="" type="checkbox"/> Cell Phone (Work):	Phone: 720-878-3266 <input type="checkbox"/> Home <input checked="" type="checkbox"/> Cell Phone (Work):
E-mail (optional): afelix@enduringresources.com	E-mail (optional): jconley@enduringresources.com

FOR OSE INTERNAL USE		Application for Permit, Form WR-07, Rev 11/17/16	
File No.: SJ-4301 POD1	Trn. No.:	Receipt No.: 5-6162	
Trans Description (optional):			
Sub-Basin:		PCW/LOG Due Date: 8/27/2019	



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 1/10<sup>th</sup> 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
SJ-4301 POD 1	-107 34'34.5973"	36 08'38.6612"	NW/4 NE/4 of Section 16, T22N, R7W

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

Other description relating well to common landmarks, streets, or other:  
48.9 miles South from intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM

Well is on land owned by: New Mexico State Land Office

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): 6,763'

Outside diameter of well casing (inches): 7"

Driller Name: Mote Drilling Inc

Driller License Number: 733

2018 JUL 1 AM 10:41  
STATE ENGINEER OFFICE  
AZTEC, NEW MEXICO

3. ADDITIONAL STATEMENTS OR EXPLANATIONS

Enduring Resources IV, LLC well name: NEU 2207-16B WSW

Received by OCD: 1/7/2024 11:26:50 AM

FOR OSE INTERNAL USE

Application for Permit, Form WR-07

File No.: SJ-4301 POD1

Trn No.:

Page 2 of 3

Released to Imaging: 1/7/2024 11:30:15 AM





**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:

<b>Exploratory:</b> <input checked="" type="checkbox"/> Include a description of any proposed pump test, if applicable.	<b>Pollution Control and/or Recovery:</b> <input type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for the pollution control or recovery operation. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The annual diversion amount. <input type="checkbox"/> The annual consumptive use amount. <input type="checkbox"/> The maximum amount of water to be diverted and injected for the duration of the operation. <input type="checkbox"/> The method and place of discharge.	<b>Construction De-Watering:</b> <input type="checkbox"/> Include a description of the proposed dewatering operation, <input type="checkbox"/> The estimated duration of the operation, <input type="checkbox"/> The maximum amount of water to be diverted, <input type="checkbox"/> A description of the need for the dewatering operation, and, <input type="checkbox"/> A description of how the diverted water will be disposed of.	<b>Mine De-Watering:</b> <input type="checkbox"/> Include a plan for pollution control/recovery, that includes the following: <input type="checkbox"/> A description of the need for mine dewatering. <input type="checkbox"/> The estimated maximum period of time for completion of the operation. <input type="checkbox"/> The source(s) of the water to be diverted. <input type="checkbox"/> The geohydrologic characteristics of the aquifer(s). <input type="checkbox"/> The maximum amount of water to be diverted per annum. <input type="checkbox"/> The maximum amount of water to be diverted for the duration of the operation. <input type="checkbox"/> The quality of the water.
<b>Monitoring:</b> <input type="checkbox"/> Include the reason for the monitoring well, and, <input type="checkbox"/> The duration of the planned monitoring.	<input type="checkbox"/> The method of measurement of water produced and discharged. <input type="checkbox"/> The source of water to be injected. <input type="checkbox"/> The method of measurement of water injected. <input type="checkbox"/> The characteristics of the aquifer. <input type="checkbox"/> The method of determining the resulting annual consumptive use of water and depletion from any related stream system. <input type="checkbox"/> Proof of any permit required from the New Mexico Environment Department. <input type="checkbox"/> 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.	<b>Ground Source Heat Pump:</b> <input type="checkbox"/> Include a description of the geothermal heat exchange project, <input type="checkbox"/> The number of boreholes for the completed project and required depths. <input type="checkbox"/> The time frame for constructing the geothermal heat exchange project, and, <input type="checkbox"/> The duration of the project. <input type="checkbox"/> Preliminary surveys, design data, and additional information shall be included to provide all essential facts relating to the request.	<input type="checkbox"/> The method of measurement of water diverted. <input type="checkbox"/> The recharge of water to the aquifer. <input type="checkbox"/> Description of the estimated area of hydrologic effect of the project. <input type="checkbox"/> The method and place of discharge. <input type="checkbox"/> An estimation of the effects on surface water rights and underground water rights from the mine dewatering project. <input type="checkbox"/> A description of the methods employed to estimate effects on surface water rights and underground water rights. <input type="checkbox"/> Information on existing wells, rivers, springs, and wetlands within the area of hydrologic effect.

#### ACKNOWLEDGEMENT

I, We (name of applicant(s)), Enduring Resources, IV, LLC by Andrea Felix & John Conley

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 27th day of August 20 18, for the State Engineer,

Tom Blaine, P.E.

State Engineer

By: Blaine Watson  
Signature

Print

Blaine Watson

Title: District V Manager  
Print

FOR USE INTERNAL USE

Application for Permit, Form WR-07

File No.: SJ-4301 POD1

Tm No.:





## ARTESIAN WELL PLAN OF OPERATIONS

(for new well construction and repairs)



An Artesian Well Plan of Operations shall be filed with and approved by the Office of the State Engineer prior to commencing the drilling or repairing of an artesian well.

A detailed diagram of the proposed artesian well shall be attached to this plan.

**I. FILING FEE:** There is no filing fee for this form.

**II. GENERAL / WELL OWNERSHIP:**

Office of the State Engineer POD Number (Well Number) for well (if known): SJ-4301 POD 1

Name of well owner: Enduring Resources IV, LLC

Mailing address: 332 Road 3100

City: Aztec State: NM Zip code: 87410

Phone number: 505-386-8205 Andrea Felix E-mail: afelix@enduringresources.com

**III. WELL DRILLER INFORMATION:**

Well Driller contracted to provide drilling services: Mota Drilling Inc.

New Mexico Well Driller License No.: 733 Expiration Date: 6-30-2019

**IV. WELL INFORMATION:**

- 1) Will this well be used for any type of monitoring program? no If yes, please describe in section V; applicant should be familiar with the need for specialty materials or design required for the monitoring program.
- 2) Will the well tap or penetrate brackish, saline, or otherwise poor quality water? Yes If yes, please provide additional detail in section V.
- 3) Depth of top of the anticipated artesian aquifer: 6263 feet below ground level (bgl)
- 4) Is a flowing artesian head anticipated? No
- 5) Will a pitless adapter be installed in the well? No
- 6) GPS Well Location: Latitude: 36 deg, 08 min, 39 sec  
Longitude: -107 deg, 34 min, 35 sec, NAD 83
- 7) Will permanent surface casing be installed? Yes If yes, provide details below. (Note: surface casing is shallow casing generally set above the confining unit overlying the artesian aquifer and is considered optional).
  - a) Diameter of borehole to be drilled for the surface casing: 17.50 inches.
  - b) Proposed surface casing depth: 350 feet below ground level.

Artesian Well Plan of Operations  
Revised October 6, 2017  
Page 1 of 4

STATE ENGINEER OFFICE  
AZTEC, NEW MEXICO

2018 JUN -7 AM 10:14



STATE ENGINEER OFFICE  
AZTEC, NEW MEXICO

2018 AUG -7 AM 10:14

- c) Surface casing material, grade: Steel J55
- d) Inside diameter (ID): 12.615 inches.
- e) Outside diameter (OD): 13.375 inches.
- f) Wall thickness: 0.380 inches.
- g) Casing joint connection type (note whether welded, glued, coupled, etc. If coupled, include outside diameter OD and the length in inches, and also the number of threads per inch.):  
BTC connection, 14.375" OD, 10.625" long, 5 threads per inch
- h) Interval of proposed surface casing annular sanitary seal: 0 to 350 feet below ground level.
- i) Surface casing sanitary seal material:  
Cement

8) Artesian casing (Note: artesian casing shall be set adequately into the confining unit overlying the artesian aquifer; in some designs this may also be the production casing; NMOSE inspection requirements apply to installing, grouting and testing the artesian casing):

- a) Diameter of borehole to be drilled for the artesian casing: 12.25 inches.
- b) Proposed artesian casing depth: 6736 feet below ground level.
- c) Artesian casing material, grade: Steel L80 (HCL-80) @ 26.0 lb/ft
- d) Inside diameter (ID): 6.368 inches. → 6.276 inches
- e) Outside diameter (OD): 7.000 inches.
- f) Wall thickness: 0.317 inches. → 0.362 inches
- g) Casing joint connection type (note whether welded, glued, coupled, etc. If coupled, include outside diameter (OD) and the length in inches, and also the number of threads per inch.)  
LTC connection, 7.875" OD, 9.000" long, 8 threads per inch
- h) Type and spacing of artesian casing centralizers: To be determined DHR  
bow spring, 2 per joint on bottom 3 jts, 1 per joint to 500' above Entrada, 1 every 3 joints to surface
- i) Manufacturer and model of float shoe: Weatherford Sure-Seal 3
- j) Method of annular grout placement: check one Pressure Grout ☐ Tremmie Pipe ☐
- k) Interval of proposed annular grout: 0 to 6,736 feet below ground level.
- l) Proposed annular grout mix: \_\_\_\_\_ gallons of water per 94 pound sack of Portland cement.
- m) Cement type proposed: \_\_\_\_\_
- n) Theoretical volume of annular grout required: \_\_\_\_\_
- o) Will the grout be: ☐ batch-mixed and delivered to the site  
☐ mixed on site
- p) Grout additives requested, and percent by dry weight relative to cement: (See AWWA Standard A100-06 or Halliburton red book; common additives: calcium chloride, bentonite solution, pozzolan ash):

SEE DETAIL  
ON ENDURANCE  
RESOURCES  
DRAWING PLAN  
DHR





## q) Additional notes and calculations:

## 9) Production casing (set through the artesian casing and into the artesian aquifer; may not be necessary if the artesian casing is used as the production casing):

a) Will you be using a production casing within the artesian casing?       No       If yes, provide a description of the following in section V:

- i. Diameter of borehole to be drilled for production casing; casing joint connection type - note whether coupled, welded, glued, etc.; proposed production casing depth; and inside diameter, outside diameter, wall thickness, casing material, and casing material grade of production casing.
- ii. List the proposed screened/ perforated interval(s) if you plan to use well screen or perforated casing.
- iii. List the vertical intervals and seal or fill material if the annulus between the production casing and artesian casing/borehole is to be sealed/ filled.

**V. ADDITIONAL INFORMATION:** List additional information below, or on separate sheet(s):

If during the drilling of the well, conditions dictate the need for a cement stage tool, Enduring would intend to install that cement stage tool in the 7" casing at depth to be determined by those conditions. And that determination would be made on a well by well basis and will be coordinated with and approved by the State Engineer. Enduring does not anticipate a stage tool is necessary at this time.

2018 AUG -7 AM 10:14

STATE ENGINEER'S OFFICE  
AZTEC, NEW MEXICO**VI. SIGNATURE:**

I, Enduring Resources W, LLC, say that I have carefully read the foregoing Artesian Well Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Artesian Well Plan of Operations and attachments are true to the best of my knowledge and belief.

  
Signature of Applicant

8-1-2018  
Date

  
Signature of Well driller

8-1-18  
Date

Artesian Well Plan of Operations  
Revised October 6, 2017  
Page 3 of 4

10/1/2023 11:26:50 AM



**VII. ACTION OF THE STATE ENGINEER:**

This Artesian Well Plan of Operations is:

- ☒ Approved subject to the attached conditions. — CONTINUES BELOW
- ☐ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 21<sup>ST</sup> day of AUGUST 2018TOM BLAINE, P.E. State EngineerBy: Douglas H. RapuhnDOUGLAS H. RAPUHN, P.E., HYDROLOGY BUREAU

THIS ARTESIAN WELL PLAN OF OPERATIONS IS APPROVED SUBJECT TO THE CONDITIONS OF THE APPROVED SJ-4301 POD-1 NMOSE WR-07 APPLICATION FOR PERMIT TO DRILL A WELL WITH NO WATER RIGHT. THIS APPROVAL IS BASED ON REVIEW OF INFORMATION PROVIDED IN THIS NMOSE ARTESIAN WELL PLAN OF OPERATIONS, ASSOCIATED ENDURING RESOURCES II LLC SJ-4301 POD-1 DRILLING PLAN, AND RELATED SUBMITTALS PROVIDED TO THE NMOSE REGARDING CASING, CEMENTING, & GENERAL WELL DESIGN.

2018 AUG -7 AM 10:14

STATE ENGINEER OFFICE  
ALBUQUERQUE, NEW MEXICO



2018 AUG 20 AM 10:24



**ENDURING RESOURCES IV, LLC**  
**511 SIXTEENTH STREET, SUITE 700**  
**DENVER, COLORADO 80202**

**DRILLING PLAN:** *Drill, complete, and equip water supply well in the Entrada formation*

**WELL INFORMATION:**

**Name:** North Escavda Unit 2207-16B WSW (SJ-4301 POD1)  
**State:** New Mexico  
**County:** Sandoval

**Surface Elevation:** 6,917 ft ASL (GL) 6,931 ft ASL (KB)  
**Surface Location:** 16-22N-07W Sec-Twn-Rng TBD ft FNL TBD ft FEL  
TBD ° N latitude TBD ° W longitude (NAD 83)  
**BH Location:** 16-22N-07W Sec-Twn-Rng TBD ft FNL TBD ft FWL  
TBD ° N latitude TBD ° W longitude (NAD 83)

**Driving Directions:** From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM: south on 550 for approximately 50 miles to Enduring Gallup fireld Exact directions TBD.

**GEOLOGIC AND RESERVOIR INFORMATION:**

Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,850	81	81	W	normal
	Kirtland	6,630	301	301	W	normal
	Fruitland	6,520	411	411	G, W	sub
	Pictured Cliffs	6,220	711	711	G, W	sub
	Lewis	6,045	886	886	G, W	normal
	Chacra	5,880	1,051	1,051	G, W	normal
	Cliff House	5,495	1,436	1,436	G, W	sub
	Menefee	4,745	2,186	2,186	G, W	normal
	Point Lookout	3,820	3,111	3,111	G, W	normal
	Mancos	3,595	3,336	3,336	O,G	normal
	Gallup	3,395	3,536	3,536	O,G	normal
	Base Greenhorn	1,880	5,051	5,051	G, W	normal
	Dakota	1,830	5,101	5,101	G, W	normal
	Morrison	1,570	5,361	5,361	G, W	normal
	Todilto	750	6,181	6,181	G, W	normal
	Entrada	695	6,236	6,236	O,G,W	normal
	<b>TOTAL DEPTH</b>	<b>195</b>	<b>6,736</b>	<b>6,736</b>	<b>O,G,W</b>	<b>normal</b>

**Surface:** Nacimiento

**Oil & Gas Zones:** Several gas bearing zones will be encountered; target formation is the Entrada

**Pressure:** Normal (0.43 psi/ft) or sub-normal pressure gradient anticipated in all formations

Max. pressure gradient: 0.43 psi/ft Evacuated hole gradient: 0.22 psi/ft

Maximum anticipated BH pressure, assuming maximum pressure gradient: 2,690 psi

Maximum anticipated surface pressure, assuming partially evacuated hole: 1,320 psi

**Temperature:** Maximum anticipated BHT is 205° F or less

**H<sub>2</sub>S INFORMATION:**

**H<sub>2</sub>S Zones:** Encountering hydrogen-sulfide bearing zones is NOT anticipated.

**Safety:** Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

**LOGGING, CORING, AND TESTING:**

**Mud Logs:** Mud logging and cuttings sampling is planned; geologist will monitor remotely; total gas chromatograph will be run from drillout of 13-3/8" casing to TD



**MWD / LWD:** Gamma Ray from drillout of 13-3/8" casing to TD  
**Open Hole Logs:** Triple-Combo log from TD of 12-1/4" hole to surface  
**Testing:** None planned  
**Coring:** None planned  
**Cased Hole Logs:** CBL on 7" casing from PBTD to surface

#### DRILLING RIG INFORMATION:

**Contractor:** Mo-Te  
**Rig No.:** Aztec 920  
**Draw Works:** TSM-850, 1,000 hp  
**Mast:** 106', 440,000 lbs  
**Top Drive:** Tesco 250 ton  
**Prime Movers:** 2 CAT C-18  
**Pumps:** 2 - RSF-1300 (3,000 psi)  
**BOPE 1:** Double Gate Ram (11" 3,000 psi)  
**BOPE 2:** Annular Preventer (11" 3,000 psi)  
**Choke** 3" x 5,000 psi  
**KB-Gl (ft):** 14

2018 AUG 20 AM 10:23

CALIFORNIA OFFICE  
 AZTEC, NEW MEXICO

#### BOPE REQUIREMENTS:

*See attached diagram for details regarding BOPE specifications and configuration.*

- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2) Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well.
- 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum.
- 3) BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) If the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psi for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally the BOP and casing string will be tested to .22 psi/ft (or 1,500 psi minimum) for 30 and 60 minutes respectively, prior to drilling out 13-3/8". Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.
- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be installed on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when there is no power to the accumulator.

#### FLUIDS AND SOLIDS CONTROL PROGRAM:

- Fluid Measurement:** Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station.
- Closed-Loop System:** A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimize the amount of fluids and solids that require disposal.





**Fluid Disposal:** Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).

**Solids Disposal:** Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products. Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).

**Fluid Program:** See "Detailed Drilling Plan" section for specifics.

#### DETAILED DRILLING PLAN:

**SURFACE:** Drill vertically to casing setting depth, run casing, install wellhead, cement casing to surface.

0 ft (MD)	to	350 ft (MD)	Hole Section Length:	350 ft
0 ft (TVD)	to	350 ft (TVD)	Casing Required:	350 ft

Note: Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud mud

**Hole Size:** 17-1/2"

**Bit / Motor:** Mill Tooth or PDC, no motor

**MWD / Survey:** No MWD, run gyro survey in 100' stations after drilling

**Logging:** None

Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)	
Specs		13.375	54.5	J-55	STC	1,130	2,730	853,000	514,000
Loading						153	1,520	116,634	116,634
Min. S.F.						7.39	1.80	7.31	4.41

Assumptions: Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient

Burst: maximum anticipated surface pressure or maximum test pressure with 9.5 ppg fluid inside casing while drilling production hole and 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 8.4 ppg fluid with 100,000 lbs over-pull

**MU Torque (ft lbs):** Minimum: 3,860 Optimum: 5,140 Maximum: 6,430

**Casing Details:** Guide shoe, single-valve float collar, 1 jt casing, double-valve float collar, landing collar, casing to surface, 11" 5K API-certified wellhead

**Centralizers:** 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 2 jts to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
	Class G	15.8	1.174	5.15	100%	0	414

**Annular Capacity** 0.6946 cuft/ft (17-1/2" hole x 13-3/8" casing annulus)

Calculated cement volumes assume gauge hole and the excess noted in table  
Halliburton HALCEM surface cementing blend

**PRODUCTION:** Drill to TD following directional plan, run casing, cement casing to surface.

350 ft (MD)	to	6,736 ft (MD)	Hole Section Length:	6,386 ft
350 ft (TVD)	to	6,736 ft (TVD)	Casing Required:	6,736 ft

Fluid:	Type	MW (ppg)	FL (mL/30')	PV (cp)	YP (lb/100 ft <sup>2</sup> )	pH	Comments
	KCl Fluid	8.8 - 9.5	20	8 - 14	8 - 14	9.0 - 9.5	

**Hole Size:** 12-1/4"

**Bit / Motor:** PDC w/mud motor

**MWD / Survey:** MWD with GR, inclination, and azimuth (every 100' at minimum)

**Logging:** GR MWD for entire section, mud log for entire section, Triple Combo OH logs

**Procedure:** NU BOPE and test (as noted above); pressure test 13-3/8" casing to 1,500 psi for 30 minutes.





Drill vertically to TD. Steer as needed to keep well vertical. Keep DLS < 2 deg/100' and keep slide length < 10' until when making steering adjustments. Take surveys every 100' at a minimum. After reaching TD, make wiper trip(s) as dictated by hole conditions to condition hole for logs and casing running. TOH. Run OH logs from TD to surface. Run casing as described below. Space out casing as close to TD as possible. Pump cement as detailed below. Note cement volume circulated to surface.

Casing Specs:	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	7.000	23.0	HCL-80	LTC	5,650	6,340	532,000	485,000
Loading					2,942	4,981	234,161	234,161
Min. S.F.					1.92	1.27	2.27	2.07

Assumptions: Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient in the annulus  
Burst: 4,000 psi maximum surface treating pressure with 11.2 ppg equivalent mud weight sand laden fluid during fracturing operations with 8.4 ppg equivalent external pressure gradient  
Tension: buoyed weight in 8.8 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Minimum: 3,260 Optimum: 4,350 Maximum: 5,530

Casing Details: Guide shoe, single-valve float collar, 1 jt casing, double valve float collar, 1 jt casing, landing collar, casing to surface with 1 - 20' marker joint at the Dakota top

Centralizers: 2 centralizers per joint stop-banded 10' from each collar on bottom 3 joints, 1 centralizer per joint from TD to 500' above the Entrada top, 1 centralizer per 3 joints to 300' (50' inside surface casing shoe)

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
Lead	G:POZ blend	12.3	1.987	10.16	40%	0	1,387
Tail	G:POZ blend	13.3	1.354	5.94	10%	3,536	1,435

Annular Capacity 0.6007 cuft/ft (13-3/8" casing x 7" casing annulus)

0.5521 cuft/ft (12-1/4" hole x 7" casing annulus)

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton ECONOCEM & EXTENDACEM cementing blend

#### Cementing Stage Tool Contingency

If during the drilling of the well, conditions dictate the need for a cement stage tool, Enduring would intend to install that cement stage tool in the 7" casing at depth to be determined by those conditions. And that determination would be made on a well by well basis and will be coordinated with and approved by the State Engineer. Enduring does not anticipate a stage tool is necessary at this time.

**FINISH WELL:** ND BOP, NU WH with BPV and cap, RDMO.

**Procedure:** ND BOP. Install BPV in WH. Install cap with pressure gauge on WH. Frac stack to be installed at later date. RDMO.

#### **COMPLETION AND PRODUCTION PLAN:**

**Completion:** Pressure test 7" casing to 3000 psig or maximum treating pressure, whichever is higher for 60 minutes. Run CBL to from TD to surface. Perforate Entrada. TIH with packer and break down Entrada perforations. Swab back load water and collect formation water sample. Perform complete water analysis. Perforations may be acidized or fracture stimulated to improve inflow.

**Production:** Well will produce up 3-1/2" production tubing via ESP into water storage facility.

#### **ESTIMATED START DATES:**

Drilling: 9/1/2018  
Completion: 10/1/2018  
Production: 10/31/2018

Prepared by: Alec Bridge 5/4/2018

2018 AUG 20 AM 10:25  
C:\GEO\PROJECTS\NEU\2207-16B\WELL\NEU2207-16B-001.DWG



COOPER, J. E. 1973. The



**NMOSE Permit to Explore Underground Water – Conditions of Approval  
SJ-4301 (POD1)**

The New Mexico Office of the State Engineer (NMOSE) has determined that existing water rights will not be permanently impaired by this activity. This application is approved without publication 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. This application approval (i.e., permit) is further subject to the following conditions of approval.

1. This permit is approved as follows:

Permittee(s): Enduring Resources IV, LLC  
Attn: Andrea Felix  
332 CR 3100  
Aztec, NM 87410

File Number: SJ-4301 POD1

Application File Date: July 11, 2018, as amended

Priority: N/A

Source: San Juan Underground Water Basin

Point(s) of Diversion: One point of diversion (POD), SJ-4301 POD1, is proposed. The proposed well will be located on land owned by the State of New Mexico (NM State Land Office) in Sandoval County, New Mexico. The well will be located within the NW/4 NE/4 of Section 16, Township 22 North, Range 7 West, NMPM, at the following approximate point location (Long/Lat, WGS84).

POD Number and (Owner's Well Name)	Casing: Diameter (inches) and Depth (feet)		Longitude (deg/min/sec)	Latitude (deg/min/sec)
SJ-4301 POD1 (NEU 2207-16B WSW)	7	6736	107° 34' 34.5973" W	36° 08' 38.6612" N

Purpose of Use: Aquifer testing related to Notice of Intention process

Place of Use: N/A

Amount of Water: Aquifer testing only, not to exceed 10 cumulative days in length

2. The temporary appropriation of water authorized by this permit does not establish a water right.
3. No water shall be diverted from the well(s)/boreholes(s) except for aquifer testing and water quality sampling purposes.
4. This permit authorizes the drilling and completion of a well for purposes of temporary diversion of groundwater to conduct aquifer testing and water sampling needed to determine the suitability for future use of the well to appropriate water in accordance with Deep Non-Potable Water statutes at §§ 72-12-25 through -28, NMSA 1978.



5. Pursuant to 72-8-1 NMSA 1978, the Permittee shall allow the State Engineer and his representative entry upon private property for the performance of their respective duties.
6. The well shall be constructed, maintained, and operated to prevent inter-aquifer exchange of water and to prevent loss of hydraulic head between geologic zones.
7. Lithologic samples ("drill cuttings") shall be collected during drilling and preserved for submission to the New Mexico Bureau of Geology upon completion of the well. Samples shall be collected and labeled, at a minimum, with well/POD identification information, collection date, and sample depth. Approximate half-pint samples are required, collected at twenty-foot intervals through drilled depth for this well.
8. Water samples shall be collected for purposes of conducting the necessary laboratory analyses to determine initial conditions of the target formation water with regard to status as 'nonpotable'. At a minimum, laboratory analyses shall include the following: pH, specific conductance, total dissolved solids, and major cations/anions. Analyses shall be conducted by an accredited analytical laboratory and laboratory analytical results shall be provided to NMOSE along with originals or copies of the full laboratory report. Field measurement of sample pH, temperature, and specific conductance is also required.
9. Groundwater diverted during the aquifer testing may be used by the applicant, if suitable, or it may be stored for later use or disposal. If no use is anticipated, the water may be disposed in accordance with applicable local, state, and federal requirements. Prior to placing any aquifer testing water to use or disposing of the water, the permittee shall notify the NMOSE in writing of the specific method of use (or disposal). No notification is required for interim treatment and storage of the water.
10. The total volume of water diverted and discharged shall be determined and reported to the NMOSE District V office in Aztec no later than 10 days following the completion of the aquifer testing and sampling. The report shall also include the final method of disposal of all water diverted. The NMOSE District V mailing address is 100 Gossett Drive, Suite A, Aztec, NM 87410. A reporting form (WR-26) is available for use, and can be found at the following web address: <http://www.ose.state.nm.us/Meter/index.php>.
11. Water well drilling and well drilling activities, including well plugging, are regulated under NMOSE Regulations 19.27.4 NMAC. These regulations apply, and provide both general and specific direction regarding the drilling of wells in New Mexico. Note that the construction of any well that allows groundwater to flow uncontrolled to the land surface or to move appreciably between hydrogeologic units is prohibited.
12. In accordance with Subsection A of 19.27.4.29 NMAC, on-site supervision of well drilling/plugging by the holder of a New Mexico Well Driller License or a NMOSE-registered Drill Rig Supervisor is required. The New Mexico licensed Well Driller shall ensure that well drilling activities are completed in accordance with 19.27.4.29, 19.27.4.30 19.27.4.31, and 19.27.4.33 NMAC. While conducting the well drilling activities, the Well Driller shall maintain a copy of the approved permit, conditions, and Artesian Plan of Operations on site and available for inspection upon request.

13. The permittee has submitted an Artesian Plan of Operations concurrently with this permit application. The approved Artesian Plan provides specific approved methods, materials, and drilling approaches that shall be followed by the permittee for the drilling and completion of this well. All rules and regulations pertaining to the drilling, casing and plugging of artesian wells provided for in 19.27.4.29, 19.27.4.31, and 19.27.4.33 NMAC shall be followed.
14. The pre-installation inspection of well casing set to / into artesian aquifers, witnessing of the annular cementing of well casing set to / into artesian aquifers, and testing of casing set to / into artesian aquifers shall be attended by an authorized representative of the State Engineer. Please contact Blaine Watson at 505-334-4571 (or Doug Rappuhn at 505-383-4018) to coordinate the required inspections, and allow reasonable lead time for NMOSE representatives to schedule staff and arrive at remote locations. Alternatives to onsite witnessing may be utilized at the discretion of the State Engineer.
15. Integration of stage-cementing tools in the well casing may be requested by the applicant upon substantiation of downhole conditions warranting its use. The determination of installation or deployment of stage-cementing tools shall be coordinated with and approved by the State Engineer.
16. Downhole pressure differentials created by the placement of cement slurries may collapse casing pipe and related tubing in unbalanced wells. NMOSE approval of Artesian Plan of Operations does not imply NMOSE responsibility for the improper balancing of fluids or over-pressurization of casing or tubing in drilling or cementing operations, or during testing.
17. Cement bond logging of the proposed 7-inch artesian casing is required to verify adequate placement and bonding of the annular cement.
18. The State Engineer may require additional comprehensive data filings related to well construction, testing, and sampling to assess applicant assertions the well complies with §§ 72-12-25 through -28, NMSA 1978, and relevant portions of 19.27.4. NMAC. These include, but are not limited to driller daily logs, detailed lithologic descriptions recorded, geophysical logs, cementing reports, water chemistry analyses, and test-pumping records. Provision of periodic lithologic log updates and prompt submittal of geophysical logs and cementing reports will be required.
19. If this permit expires and the permittee has not either applied for or obtained a separate permit or authorization to use water from the well, the NMOSE may require the well to either be permanently plugged or capped. In the event a permit or authorization to use water has been applied for before this permit expires and is then denied after this permit would otherwise have expired, the NMOSE may require the well to be permanently plugged or capped.
20. A Well Record shall be filed for the completed well in accordance with Subsection N of 19.27.4.29 NMAC. **Well Records shall be filed with the State Engineer (NMOSE District V, 100 Gossett Drive, Suite A, Aztec, NM, 87410) within 30 days after completion of the well(s).**
21. Should permanent decommissioning of the well be required, plugging shall be performed under the supervision of a New Mexico licensed Well Driller. Due to the existence of artesian conditions, the well shall be plugged pursuant to Subsection K of 19.27.4.31 NMAC. A Well

Plugging Plan of Operations shall be submitted, and NMOSE approval obtained, *prior* to the initiation of *any* well plugging activities involving artesian wells.

22. Within 30 days after completion of well plugging, a complete Plugging Record shall be filed with the State Engineer in accordance with Subsection K of 19.27.4.31 NMAC. The Well Plugging Record(s) shall be filed with the State Engineer at the NMOSE District V Office, 100 Gossett Drive, Suite A, Aztec, NM 87410. The required well plugging record form (WD-11) is available at <http://www.ose.state.nm.us/STST/wdForms.php>
23. Should another regulatory agency sharing jurisdiction of the project have additional requirements than those stated herein, the approval granted herein does not relieve the permittee from any such requirements.
24. Pursuant to 72-12-3 NMSA 1978, the applicant may or may not have provided written documentation with the application, which the applicant claims as confirmation that access has been granted for the aforementioned well(s) to be located on property owned by someone other than the well owner/applicant. NMOSE approval of this permit in no way implies the right of access to land not owned by the well owner/applicant.
25. The State Engineer retains jurisdiction of this permit.
26. **This permit shall automatically expire one year from the date of approval.**

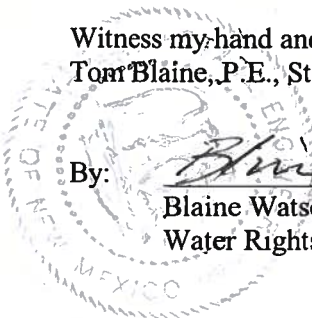
This application to explore groundwater, submitted on July 11, 2018, and as subsequently amended, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and seal this 27<sup>th</sup> day of August, A.D. 2018.

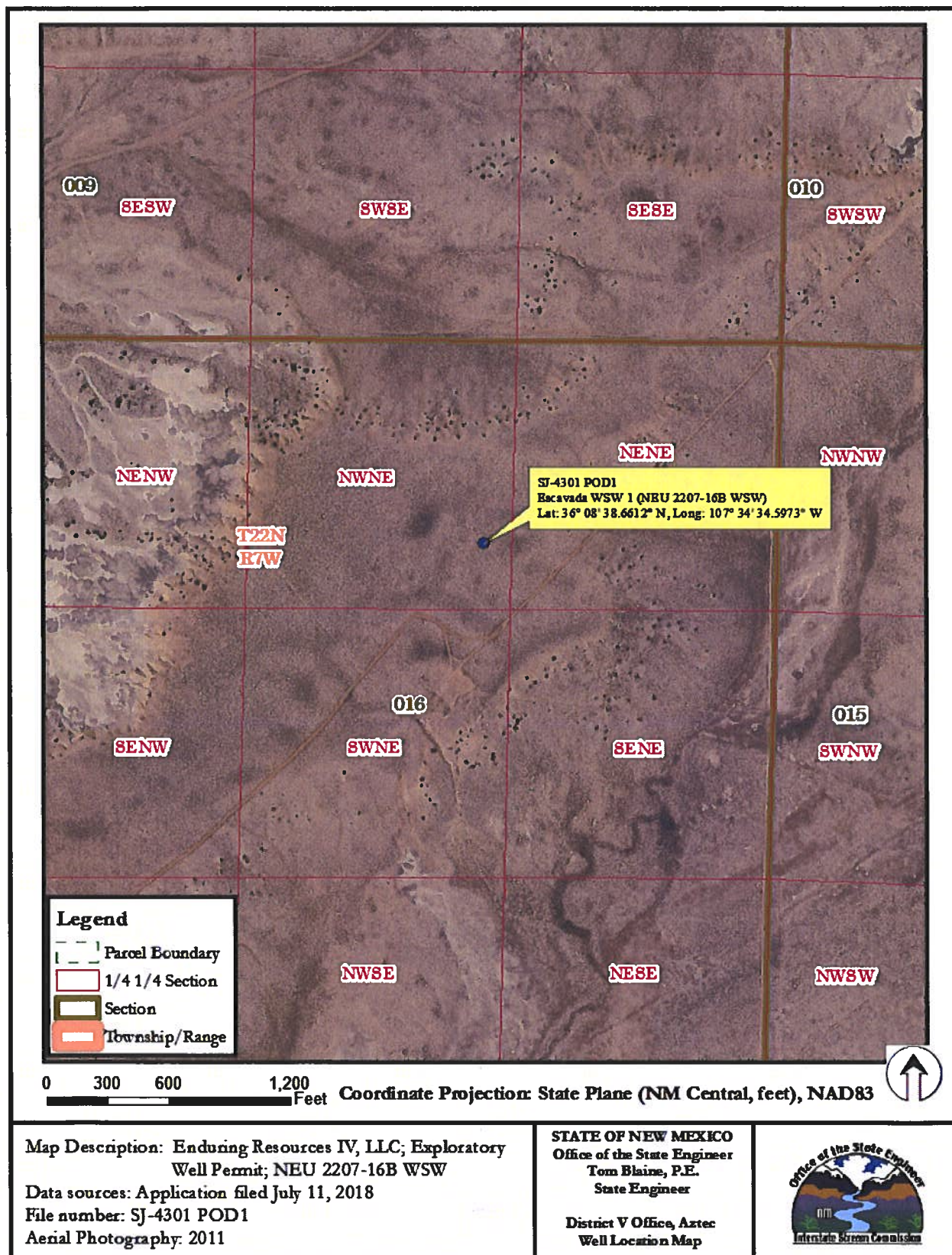
Tom Blaine, P.E., State Engineer

By:

  
Blaine Watson, Manager  
Water Rights Division, District V









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

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

CONDITIONS  
  
Action 300677

CONDITIONS

Operator: NEW MEXICO ENERGY MINERALS & NATURAL RESOURCE 1220 S St Francis Dr Santa Fe , NM 87504	OGRID: 264235
	Action Number: 300677
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
pgoetze	None	1/7/2024