

EMID-701871 Rec'd 2/7/22

STATE OF NEW MEXICO OFFICE OF THE STATE ENGINEER District VI Office, Santa Fe, NM

AMMAN, P.E.

MIKE A. HAMMAN, P.E. STATE ENGINEER PO Box 25102 Santa Fe, N.M 87504-5102 (505) 827-6120

February 7, 2022

Los Alamos National Laboratory Attn: Christian Maupin, Agent 600 6th Street Los Alamos, NM 87544

Re: Request for Amendment to Approved [Amended] Well Plugging Plan of Operation Conditions of Approval for RG-98113

Greetings:

The Office of the State Engineer has denied your [draft] proposed amendment to the Revised Plugging and Abandonment of [RG-98113] R-25.

Please find the approved amended well plugging procedure and Conditions of Approval for the revised Well Plugging Plan of Operations for RG-98113 which hereby supersede all previous approvals for the Well Plugging Plan of Operations, approved July 15, 2019, and approved amendment June 19, 2020. Please note Condition of Approval No. 19 requiring a timeline of events to be submitted to the NMOSE within 30 days of receipt of this approval.

Per Condition of Approval No. 18 herein, no deviation from this approved amended Well Plugging Plan of Operations shall be allowed. Additionally, Condition of Approval No. 17 specifically requires all decommissioning activities for RG-98113 shall be witnessed onsite by NMOSE or its authorized agent. LANL/N3B shall contact NMOSE or its authorized agent within 72 hours of all decommissioning activities to schedule witnessing.

Please review all the Conditions of Approval for the approved OSE Revised Well Plugging Plan of Operations for RG-98113 as they require requires further action on your part.

Pursuant to Section 72-2-16, NMSA 1978, if you are aggrieved by this decision, you may submit a request to this office asking for a hearing to be held. The request must be in writing and must be submitted no later than 30 days after receipt of this letter. Failure to request a hearing by such time will waive your right to request a hearing on this decision. In accordance with Subsection B of 19.25.2.10 NMAC, you will be required to pay a hearing fee when the hearing is announced by the OSE Hearings Unit. The State Engineer shall determine the amount of the deposit. Aggrieval of the permit or any of the conditions of approval suspends the permit.

Contact me with any questions or comments.

Sincerety K

Christopher M. Thornburg Upper Pecos Basin Lead Water Rights Division, Santa Fe (505) 827-6120

Conditions of Approval and Approved Procedure for Well Decommission

Location: Los Alamos Nation Laboratory, New Mexico. Approximate well coordinates: See tabulated data (LAT/LONG WGS84).

Well Name	Inside diameter (inches)	Total depth (feet)	Static Water Level	Easting (X)	Northing (Y)
RG-98113	5		0.5 bgs	35°59'58.3"	105°58'56.9"

The following OSE Procedure and Conditions of Approval for this prescribed remedy are approved for use:

OSE Approved Procedure:

- 1. A complete well video log shall be run from ground surface to total depth of the well. The video log shall be witnessed by the NMOSE or its authorized agent. The well video log shall have an operable depth counter. The depth of log shall be visible on the video and shall be recorded throughout the entire well video log run. A copy (on either a jump drive or DVD) of the entire well video log shall be made available to the NMOSE upon completion of said log.
- 2. A neat cement plug shall be placed between 1,252 bgs and 1,220 bgs. The plug shall not contain any additives such as sand or bentonite. The tremie shall be placed as close 1,252 bgs as possible and shall remain under the column of cement throughout the placement process. Upon completion of placement, the cement plug shall be allowed to cure no less than 48-hours and no further plugging activities shall be allowed during this wait time.
- 3. The well casing shall be perforated between 1,220 bgs and 1,184 bgs. No further perforating shall be allowed at this point.
- 4. A packer or some other means of squeezing cement, approved by the OSE, shall be placed in the hole between 1,135 bgs and 1,174 bgs. A pressure test shall be performed to demonstrate the pressure needed to effectively squeeze the sealant into the formation. A cement plug shall be squeezed into place between 1,220 bgs and approximately 1,184 bgs. All pressures and volumes shall be recorded and submitted with the well plugging record. Cement shall be allowed to cure no less than 48-hours after this step and prior to commencement of further decommissioning activities.
- 5. Upon completion of the 48-hour wait period, the total depth of the lower seal interval shall be tagged and recorded on the Well Plugging Record.
- 6. Perforate no less than 4 perforations per foot throughout the entirety of remaining well casing to approximately 55-feet bgs.

7. The tremie shall be placed as close to the top of the lower sealed interval as possible. Neat Type I/II cement grout containing no more than 6 gallons of fresh water per 94pound sack of Portland cement shall be pumped from the total depth to surface in one continuous lift. The cement shall be placed in one continuous lift and the tremie pipe shall not be pulled above the top of the cementing column, at any time, during placement. No additives shall be permitted for this cement plug.

Conditions of Approval for the procedure as prescribed above:

1. <u>The proposed [draft] remedy (Request for Variance) and amendment to the OSE approved Well Plugging Plan of Operations for RG-98113, as proposed by LANL and its agent N3B, is denied for use.</u>

- 2. Los Alamos National Laboratory shall be held responsible for failure to properly execute the plan as it is prescribed herein, to the maximum extent of over-drilling the entire well and removing all material to properly execute a seal in a manner that will protect the regional aquifer. There will be <u>no exceptions</u>.
- 3. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.
- 4. A complete well video log shall be run from ground surface to total depth of the open hole portion of the well. The video log shall be witnessed by the NMOSE or its authorized agent. The well video log shall have an operable depth counter. The depth counter shall be visible on the video and shall be operable, accurate and recorded recorded throughout the entire well video log run. A copy (on either a jump drive or DVD) of the entire well video log shall be made available to the NMOSE upon completion of said log.
 - 1) Should the well log reflect different well conditions than were previously stated by LANL/N3B, the NMOSE reserves the right to amend this plan and/or provide additional information or direction for well decommissioning.
- 5. The total depth of the well shall be tagged by the Driller to record actual depth of the well prior to decommissioning. The actual depth of the portion of the well being plugged shall be recorded on the Plugging Record prior to submittal.
- 6. Type I/II neat cement plug containing no more than 6.0 gallons of fresh water per 94pound sack.
 - i. No additives may be used.
 - ii. Cement will be allowed to set for no less than 48 hours prior to the commencement of any further plugging activities upon completion of step #1 and step #3 of the approved procedure.

- 7. Four (4) perforations in the 5-inch casing shall be made placed at intervals not to exceed one (1) linear foot and shall be at least 2.5-inches in length per perforation. The prescribed approved procedure above shall be followed during perforation operations.
- 8. All tools used for cement squeezing shall be approved by the OSE prior to use.
- 9. The procedure used by LANL/N3B to pressure test the formation prior to cement squeezing, shall be approved by the OSE prior to use.
- 10. All recorded pressures during the cement squeeze job and all actual cement volumes shall be recorded and submitted with the Well Plugging Record.
- 11. Upon completion of the final lift of cement to surface, LANL/N3B shall be required to monitor the top of the cement in the well and replace any volume of cement lost to slippage in the well during the cement set time.
- 12. The well head and all associated appurtenances shall be removed, and the remaining hole backfilled with concrete to surface.
- 13. To maintain the integrity of the regional aquifer by assuring the plugging of RG-98113 successfully prevented any contaminants from leaking from the intermediate aquifer to the regional aquifer, Los Alamos National Laboratory shall be required to establish and maintain a monitoring program, including the installation of monitoring wells within proximity of RG-98113, as prescribed by the New Mexico Environment Department Hazardous Waste Bureau(NMED/HWB).
- 14. Should the NMED/HWB or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the plugging process.
- 15. The highest and best technology available and best management practices shall be used to the maximum extent practicable.
- Pursuant to section 72-8-1 NMSA, the permittee shall allow the State Engineer and his representative's entry upon private property for the performance of their respective duties.
- 17. A Well Plugging Record (available at: <u>http://www.ose.state.nm.us/STST/Forms/WD-11.pdf</u>) itemizing actual abandonment process and materials used shall be filed with the State Engineer (NMOSE, P.O. Box 25102 407 Galisteo Street Room 102, Santa Fe, NM 87504-5102), within 30 days after completion of well plugging.

- 18. Per §19.27.4.37 NMAC Rules and Regulations, NMOSE witnessing of the plugging and associated activities will be required and shall be facilitated by a NMOSE observed, or an authorized NMOSE agent, onsite by calling the District 6 NMOSE Office at 505-827-6120, at least 72-hours in advance. Witnessing of decommissioning activities by the NMOSE or its authorized agent, shall occur between the hours of 8:00 A.M. and 5:00 P.M., Monday through Friday and shall not occur during any observed holidays. The decommissioning of RG-98113 or any associated activities prior to placing sealant, shall not occur without an observer from the NMOSE present.
- 19. No deviation from this plan shall be acceptable unless submitted to the OSE and NMED/HWB in the form of a written request for variance. All variance requests shall be reviewed by the OSE and NMED/HWB and may not be acted upon by LANL/N3B without express written approval from both the OSE and NMED/HWB.
- 20. LANL/N3B shall be required to submit a timeline of events within 30 days of receipt of this approval. Timeline shall include, but is not limited to, commencement of well plugging operations with respect to mobilization of a New Mexico licensed driller with the equipment and tooling designed to properly execute the approved Procedure and Conditions of Approval prescribed herein.
- 21. The State Engineer shall retain jurisdiction over this permit.

Witness my hand and seal this <u>7th</u> day of <u>February</u>, 2022

MIKE A. HAMMAN, P.E. NEW MEXICO STATE ENGINEER Christopher M. Thornburg Upper Pecos Basin Lead Water Rights Division Christopher Angel By: Christopher E. Angel, PG Hydrologist

OSE Hydrology Bureau



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WELL PLUGGING PLAN OF OPERATIONS



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NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

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

II. GENERAL / WELL OWNERSHIP:

Existing	g Office of the State Engi	ineer POD Numbe	er (Well N	lumber) I	for well to be	plugged: <u>V</u>	Vell was installe	d before 200
Name o	of well owner: Departme	nt of Energy						_
Mailing	address: Mark Everett /	N3B 600 6th St.			HANK TO BE 2			
City: L	os Alamos		State:		NM		Zip code:	87544
Phonen	umber: 505-309-1367			E-mail:	mark.everett(@em-la.doe.	gov	
ID. W	ELL DRILLER INFORM	IATION:						
Well Dr	iller contracted to provide	nlugging services:	Holt Ser	vices				
New M	exico Well Driller License	No. WD-1780			Evoi	ration Date:	June 5, 2020	
146.00 100					DApi	factor bace,		
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IV. WE	ELL INFORMATION:						7	
Note: A	copy of the existing Well	Record for the we	I to be plo	ugged sho	uld be attache	d to this plan	h. (*	
			ana ang kananang ang					
1)	GPS Well Location:	Latitude:	35	deg.	50 min,	53.930284	sec	
		Longitude:	-106	deg,	20 min,	6.642553	sec, WGS84	
					Check	if seconds are	e decimal format	
2)	Reason(s) for plugging we	ell:						· · · · · ·
	Screen #3 and Screen #9 compromised. See the at "Approval with Modificatio	were damaged du tached New Mexic n: Workplan to Plu	ring the w o Environi g and Aba	ell installa nent Depa ndon Wel	tion, repair att artment approv I R-25 Los Ala	empted. The val letter date mos Nationa	e well integrity r ed January 11, Il Laboratory"	nay be 🕃 2013:
3)	Was well used for any typ what hydrogeologic para water, authorization from	e of monitoring pr meters were moni the New Mexico E	ogram? itored. If Environme	yes the well nt Depart	If yes, please was used to ment may be r	e use section monitor cor equired prior	I VII of this fo taminated or p to plugging.	rm to detail 1001 quality
4)	Does the well tap brackis	ih, saline, or other	wise poor	quality w	ater?	If ye	s, provide addit	ional detail,
	including analytical result	s and or laboratory	report(s):				200	THE SECOND
5)	Static water level:see a	attached feet belo	w land su	rface / fee	t above land s	urface (cire	cle one)	⁻ ¹
~	D 4 64 11 1	942						

6) Depth of the well: <u>1942</u> feet

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- 7) Inside diameter of innermost casing: <u>5</u> inches.
- 8) Casing material: Stainless Steel

The well was constructed with:

an open-hole production interval, state the open interval:

a well screen or perforated pipe, state the screened interval(s): 9 screened intervals, see attached

- 10) What annular interval surrounding the artesian casing of this well is cement-grouted? See attached R-25 as-built
- Was the well built with surface casing? <u>yes</u> If yes, is the annulus surrounding the surface casing grouted or <u>otherwise sealed?</u> <u>yes</u> If yes, please describe:
 20-inch borehole to 20 feet below ground surface (bgs).16-inch steel surface casing to 20 feet bgs. Surface casing

annulus was filled with cement grout.

12) Has all pumping equipment and associated piping been removed from the well? <u>No</u> If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well:

See attached description of proposed plugging procedures.

2) Will well head be cut-off below land surface after plugging? ______ Well head will be cut-off at surface of the concrete pad.

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant

- 1) For plugging intervals that employ cement grout, complete and attach Table A.
- 2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface: 1884 gal

- 4) Type of Cement proposed: Portland Type I/II
- 5) Proposed cement grout mix: 5.5-6 gallons of water per 94 pound sack of Portland cement.
- 6) Will the grout be: _____batch-mixed and delivered to the site

X mixed on site

27

Grout additives requested, and percent by dry weight relative to cement: 7)

8)

N/A

Additional notes and calculations:

Total interval plugged by cement - 1884 ft. Total gallons of cement for 1884 ft of 4.95-inch I.D. casing is approximately 1884 gallons. Total casing depth 1934ft =1884 ft cemented interval, plus 50 ft sand plug at Screen 1 per NMED modifications to the approved workplan.

Note: All calculations for cement volumes were calculated based on 4.95-inch ID casing using the Halliburton e-Redbook Version 3.0.24.

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

See the attached sheets.

VIII. SIGNATURE:

Mark Evereti _, say that I have carefully read the foregoing Well Plugging 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 Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

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3-12-19

Signature of Applicant

Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

_____ Approved subject to the attached conditions. Not approved for the reasons provided on the attached letter.

19 Witness my hand and official seal this day of D'Antonio John Tom Blaine PE , New Mexico State, Engineer Well Plugging Plan 67 Version 06/30/2017 Page 3 of 5

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	interval 2	Interval 3 - most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)	770 feet	0 ft ground level	N/A
Bottom of proposed interval of grout placement (ft bgl)	1934 feet	720 feet	N/A
Theoretical volume of grout required per interval (gallons)	1164 gallons based on 4.95-in ID casing and 1164 ft total interval	720 gallons based on 4.95-in ID casing and 720 ft total interval	N/A
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement	5.5-6 gallons per sack	5.5-6 gallons per sack	N/A
Mixed on-site or batch- mixed and delivered?	mixed on-site	mixed on-site	N/A
Grout additive 1 requested	N/A	N/A	N/A
Additive 1 percent by dry weight relative to cement	N/A	N/A	N/A
Grout additive 2 requested	N/A	N/A	N/A
Additive 2 percent by dry weight relative to cement	N/A	N/A	N/A

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TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

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	Interval 1 – deepest	Interval 2	Interval 3 - most shallow	
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.	
Top of proposed interval of sealant placement (ft bg!)	None proposed in original workplan or specified by NMED In modification to include the sand plug 720-770 ft bgl	None proposed in original workplan or specified by NMED in modification to include the sand plug 720-770 ft bgl	N/A	
Bottom of proposed sealant of grout placement (ft bgl)	None proposed in original workplan or specified by NMED in modification to include the sand plug 720-770 ft bgl	None proposed in original workplan or specified by NMED in modification to include the sand plug 720-770 ft bgl	N/A	
Theoretical volume of sealant required per interval (gallons)	N/A	N/A	N/A	
Proposed abandonment sealant (manufacturer and trade name)	N/A	N/A	N/A	



STATE OF NEW MEXICO OFFICE OF THE STATE ENGINEER DISTRICT VI-SANTA FE

John R. D'Antonio Jr., P.E. State Engineer BATAAN MEMORIAL BUILDING POST OFFICE BOX 25102 SANTA FE, NEW MEXICO 87504-5102 (505) 827-6120 FAX: (505) 827-6682

July 15, 2019

Los Alamos National Laboratory Attn: Mark Everett N3B 600 6th St. Los Alamos, NM 87544

Re: Plugging Plan of Operations for RG-98113 (R-25)

Greetings:

The Office of the Engineer is returning a favorable approval with specific plugging conditions and has accepted the Well Plugging Plan of Operations submitted March 13, 2019, for filing for the following wells:

• RG-98113 (R-25)

Please return a completed Well Plugging Report that itemizes the actual abandonment process, materials used and total volume of material used within 30 days after completion of well plugging.

Please do not hesitate to contact our office with any questions regarding these plans.

Sincerely,

Lorraine A. Garcia Office of State Engineer Water Rights Division District VI

Enclosure cc: file

NEW MEXICO OFFICE OF THE STATE ENGINEER PERMIT FOR MONITORING WELL CONDITIONS OF APPROVAL

This application proposes the pluggin of an existing LANL monitor well, constructed prior to NMOSE administration of monitor well permitting. Upon submission of this application, a NMOSE file number has been assigned to the well for permitting and tracking. As currently configured, the multi-zone monitoring well is screened into ten separate zones, including five zones in an intermediate aquifer and five zones in the regional, as identified by the paperwork submitted by the applicant. The ten aquifer zones are currently kept segregated outside the well casing with intervals of annular sealant, and segregated inside the casing via the installation of a Westbay Multi-packer Sampling System.

The applicant states that screens 3 and 9 were damaged during installation and the well integrity may be compromised, therefore the well needs to be plugged. Permittee proposes plug and abandon the well by completely removing the Westbay sampling system components, back-plugging the well with 1884 gallons of Portland Type I/II cement. At screen 1 a 50 foot sand plug will be placed as required by the New Mexico Environment Department, and the 16-inch well casing will be filled with cement grout to 20 feet below ground surface.

Permittee states the NMED has approved the proposed reconfiguration of this well. The NMOSE therefore approves this application 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 following conditions of approval:

Permittee:	Los Alamos National Laboratory Agent: Mark Everett
Permit Number:	RG-98113-POD 1
Application File Date:	March 13, 2019
Points of Diversion:	RG-98113-POD1, AKA LANL R-25 (WGS84)

OSE File Number	OSE Tag No.	Applicant Well Number	Northing (Y)	Easting (X)
RG-98113	N/A	RG-98113-POD 1	-106 [°] 20° 6.642553"	35" 50' 53.930284"
	Well will be located in Sec	tion 29 Townshin 19 North Rac	Re 06 East NMPM	

Purpose of Use: Monitoring

Specific Plugging Conditions of Approval for 1 Well for Los Alamos National Laboratory within Los Alamos County, New Mexico

- 1. Water well drilling and well drilling activities, including well plugging, are regulated under 19.27.4 NMAC, which requires any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the New Mexico Office of the State Engineer (NMOSE). Therefore, the firm of a New Mexico licensed Well Driller shall perform the well plugging.
- Theoretical volume of sealant required for abandonment of the 4.95-inch wellbore is 0.99 gallons per foot. Total theoretical volume of sealant required to fill the overdrilled portion of the hole is tabulated below. Total minimum amount of required sealant will be based on the sounding depth once the 5-inch casing has been removed.

NEW MEXICO OFFICE OF THE STATE ENGINEER PERMIT FOR MONITORING WELL CONDITIONS OF APPROVAL

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
RG-98113-POD1	4.95	1942	259.52	1941
Total:		1942	259.52	1941

- 3. The 5-inch casing shall be removed from within the auger drill string prior to sealant being placed in the boring.
- 4. Sealant shall be kept up inside the augers during placement. The augers shall be pulled out of the hole in such a manner that allows the sealant to remain inside the auger at all times, thus providing displacement to prevent borehole collapse. The augers may not be pulled out of the hole prior to the sealant being placed.
- 5. All surface completions shall be removed, if applicable. The top of the casing shall be terminated ~3-feet bgs and the remaining hole shall be backfilled with concrete to surface.
- Should the NMED, or another regulatory agency sharing jurisdiction of the project authorize, or by regulation require a more stringent well plugging procedure than herein acknowledged, the more-stringent procedure should be followed. This, in part, includes provisions regarding pre-authorization to proceed, contaminant remediation, inspection, pulling/perforating of casing, or prohibition of free discharge of any fluid from the borehole during or related to the reconfiguration process.

The NMOSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's reconfiguration intentions address known or surmised concerns regarding potential contaminant pathways. The reconfiguration method proposed addresses the NMOSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by partial back-plugging the well casing and packer installation.

- 6. NMOSE witnessing of the plugging will not be required, but shall be facilitated if a NMOSE observer is onsite. NMOSE witnessing may be requested during normal work hours by calling the District 6 NMOSE Office at 505-827-6120, at least 48-hours in advance. NMOSE inspection will occur dependent on personnel availability.
- A Well Plugging Record (available at: <u>http://www.ose.state.nm.us/STST/Forms/WD-11.pdf</u>) itemizing actual abandonment process and materials used shall be filed with the State Engineer (NMOSE, P.O. Box 25102 - 407 Galisteo Street - Room 102, Santa Fe, NM 87504-5102), <u>within 30 days after completion of well plugging</u>. Please attach a copy of these plugging conditions.

The NMOSE Well Plugging Plan of Operation, dated March 13, 2019, as annotated, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and seal this 15 day of JULY, 2019.

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

Lorraine A. Garcia Water Resource Professional- District VI

