Appendix B

New Mexico Office of the State Engineer
Plugging Plans of Operation and Plugging Records
(on CD included with this document)

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

Tom Blaine , P.E.
State Engineer

CONCHA ORTIZ Y PINO BLDG.
POST OFFICE BOX 25102
130 SOUTH CAPITOL
SANTA FE, NEW MEXICO 87504-5102
(505) 827-6091
FAX: (505) 827-3806

July 1, 2015

U.S Department of Energy/ Los Alamos National Laboratory
C/O Mark Everett
P.O Box 1663
Los Alamos, NM 87545

Re: Plugging Plan of Operation, LANL Wells

Greetings:

After a review of the Well Plugging Plan of Operations submitted on May 20, 2015, The Office of the Engineer is returning a favorable approval with specific Plugging Conditions and has accepted the Plugging Plans listed below that were submitted for filing:

- RG 95370 POTM3
- RG95371 POTM2
- RG95372 POTM1
- RG95374 MCWBB-6 2A
- RG 95376 MCWB-5
- RG 95377 BH 16P12A
- RG 95378 BH16PO
- RG 95379 BCM1

Please review the conditions and follow in plugging and return a completed Well Plugging Report that itemizes the actual abandonment process and materials used within 20 days after completion of well plugging. In addition, please include a copy of the approved Plugging Conditions enclosed.

Please address any questions via- telephone to Ramona Martinez at 505.827.6120 or via e-mail at Ramona.Martinez2@state.nm.us.

Sincerely,

Kristie A. Kilgore
Office of State Engineer
Water Resources Allocation Program
Statewide Group

Enclosure
cc: file

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. RG 95371

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
POTM-2	2.0	54.0	35°49'44.8"	106°15'16.9"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
POTM-2	2	34	0.74	5.55
POTM-2 (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			6.88	51.45

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: POTM-2

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1639021.8
North: 1757064.4

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Moisture access hole POTM-2 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

6) Depth of the well: 54.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Aluminum

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 5 to 9 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 51.9 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Moisture access hole POTM-2 was drilled in 1991 and is constructed with 54 ft of 2-in. diameter aluminum casing with holes from 5 to 9 ft bgl. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-19-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

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OFFICE OF STATE ENGINEER
SANTA FE NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			54
Theoretical volume of grout required per interval (gallons)			51.9
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. RG 95372

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
POTM-1	2.0	47.0	35°49'47.2"	106°15'33.8"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
POTM-1	2	27	0.59	4.41
POTM-1 (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			6.72	50.31

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

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By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: POTM-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1637636.0
North: 1757306.5

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Moisture access hole POTM-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 47.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Aluminum

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 5 to 9 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 50.8 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 6 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered

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SANTA FE, NEW MEXICO

__X__ mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Moisture access hole POTM-1 was drilled in 1991 and is constructed with 47 ft of 2-in. diameter aluminum casing with holes from 5 to 9 ft bgl. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

2015 MAY 20 AM 9:07

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			47
Theoretical volume of grout required per interval (gallons)			50.8
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Office of the State Engineer 1907–2007
Interstate Stream Commission
A Century of Service to New Mexico

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. RG 95374

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
MCWB-6-2A	2.0	45.5	35°51'42.6"	106°16'20.9"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
MCWB-6-2A	2	25.5	0.56	4.16
MCWB-6-2A (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			6.69	50.06

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: MCWB-6.2a

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1633754.5
North: 1768968.2

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Alluvial well MCWB-6.2a is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

6) Depth of the well: 45.5 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 30.5 to 40.5 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 50.1 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Alluvial well MCWB-6.2a was drilled in 1994 and is constructed with 45.5 ft of 2-in. diameter PVC casing with a screen from 30.5 to 40.5 ft bgl. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			45.5
Theoretical volume of grout required per interval (gallons)			50.1
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified one alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. RG 95376

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
Well MCWB-5	2.0	32	106°16'35.24"	35°51'47.7"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately 0.16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
MCWB-5	2	12	0.26	1.96
MCWB-5 (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			6.40	47.86

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: MCWB-5

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1632578.3
North: 1769484.6

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Alluvial well MCWB-5 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 32.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 17 to 27 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 47.9 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 6 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

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__X__ mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Alluvial well MCWB-5 was drilled in 1994 and is constructed with 32 ft of 2-in. diameter PVC casing with a screen from 17 to 27 ft bgl. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

2015 MAY 20 AM 9:09

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			32
Theoretical volume of grout required per interval (gallons)			47.9
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Interstate Stream Commission
A Century of Service to New Mexico

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as 169.6 feet bgs, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No.RG 95377

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
Borehole 16-P-12A	2	175.4 (video log)	35°50'54.2"	106°19'45.4"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
Borehole 16-P-12A	2	155.4	3.39	25.36
Borehole 16-P-16A (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			9.53	71.26

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: Borehole 16-P-12A

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1616925.0
North: 1764092.3

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Borehole 16-P-12A is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: 169.6 ft bgl
feet below land surface / feet above land surface (circle one)

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SANTA FE, NEW MEXICO

6) Depth of the well: 200 (completion record), 175.4 (recent LANL video log) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Aluminum

9) The well was constructed with:

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

NA a well screen or perforated pipe, state the screened interval(s): _____

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 71.2 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 6 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

2015 MAY 20 AM 9:04

OFFICE OF STATE ENGINEER
SANTA FE NEW MEXICO

__X__ mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Borehole 16-P-12A was drilled in 1987 and is constructed with 175 ft of 2-in. diameter aluminum casing with no screened interval. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

2015 MAY 28 AM 9:04

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			175
Theoretical volume of grout required per interval (gallons)			71.2
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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OFFICE OF STATE ENGINEER
SANTA FE NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Interstate Stream Commission
A Century of Service to New Mexico

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as 119.3 feet bgs, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. 95378

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
Borehole 16-P-O	2	119.9 (video log)	35° 50' 49.4"	106° 19' 50.8"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
Borehole 16-P-O	2	99.9	2.18	16.30
Borehole 16-P-O (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			8.32	62.20

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: Borehole 16-P-0

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1616480.9
North: 1763605.8

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Borehole 16-P-0 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: 119.3 ft bgl
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 135 (completion record), 119.9 (recent LANL video log) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Aluminum

9) The well was constructed with:

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

NA a well screen or perforated pipe, state the screened interval(s): _____

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 62.2 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 6 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

__X__ mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Borehole 16-P-0 was drilled in 1987 and is constructed with 120 ft of 2-in. diameter aluminum casing with no screened interval. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, 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.

Mark Everett — 5-20-15

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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

2015 MAY 20 AM 9:06

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			120
Theoretical volume of grout required per interval (gallons)			62.2
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Office of the State Engineer 1907–2007
Interstate Stream Commission
A Century of Service to New Mexico

DISTRICT 6

Tom Blaine, P.E.

NEW MEXICO STATE ENGINEER

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is reported as dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.
OSE No. RG 95379

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
BCM-1	2	67.8 (video log)	35° 53'20.93"	106°14'57.38"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of the 2" well being plugged to ~20 feet bgs and overdrilled to the determined total depth, the 2" casing shall be terminated at the bottom of the 4 ¼" x 7 ½" auger drill string prior to sealant being placed in the boring.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7

½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
BCM-1	2	47.8	1.04	7.80
BCM-1 (Overdrill - Auger Boring)	7.5	20	6.14	45.90
Totals:			7.18	53.70

6. All surface completions (vaults) will be removed, if applicable. The 2" casing will be terminated ~20 feet bgs and the remaining hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill with grout or fully encapsulated in the annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Witness my hand and official seal this 1 day of July, 2015.

Tom Blaine, P. E.
State Engineer

By: _____
Kristie A. Kilgore,
NMOSE Statewide Group
Water Rights Division

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: BCM-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1640633.6
North: 1778915.6

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: BCM-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

6) Depth of the well: 50 (completion record), 67.8 (recent LANL video log) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Galvanized steel

9) The well was constructed with:

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

NA a well screen or perforated pipe, state the screened interval(s):

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe:

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 52.1 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

BCM-1 was drilled to 94 ft bgl in 1994. The well is constructed with 68 ft of 2-in. diameter galvanized steel casing with no screened interval. All surface appurtenances will be removed from around the well before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — 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.

Witness my hand and official seal this _____ day of _____, _____

Scott A. Verhines, State Engineer

By: _____

2015 MAY 20 AM 9:03

OFFICE OF STATE ENGINEER
SANTA FE NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			67.8
Theoretical volume of grout required per interval (gallons)			52.1
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

2015 MAY 20 AM 9:03

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

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

Tom Blaine , 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 6, 2015

U.S Department of Energy/ Los Alamos National Laboratory
C/O Steve White
P.O Box 1663
Los Alamos, NM 87545

Re: Plugging Plan of Operation, LANL Wells

Greetings:

After a review of the Well Plugging Plan of Operations submitted on May 20, 2015, The Office of the Engineer is returning a favorable approval with specific Plugging Conditions and has accepted the Plugging Plans submitted for filing:

- RG-95351 TA-52NW-1
- RG-95352 TA-52SE-1
- RG-95353 TA-52 TH-1
- RG-95354 TA-52 NE-1
- RG-95355 TA-52 NE-2
- RG-95359 TSWB-6
- RG-95360 BCO-1
- RG-95362 POTO-4
- RG-95363 POTO-5
- RG-95364 R-4
- RG-95365-MCOI-1

Please return a completed Well Plugging Report that itemizes the actual abandonment process and materials used within 20 days after completion of well plugging. In addition, please include a copy of the approved Plugging Conditions enclosed.

Please address any questions via- telephone to Ramona Martinez at 505.827.6120 or via e-mail at ramona.martinez2@state.nm.us.

Sincerely,

Christopher M. Thornburg
Office of State Engineer
Water Rights Division District 6

Enclosure
cc: file

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95351

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested test well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the surface casing and casing strings are cemented in from ground surface to 87-feet. Therefore, TA-52 Test Hole NW-1 will not be overdrilled. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used a part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95351 Test well NW-1 (two wells)	2	97.0	35°51'35.5"	106°17'16.5"

Specific Plugging Conditions of Approval for 1 nested test well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Theoretical volume of sealant required for abandonment of each of the 2-inch (inside) diameter wells inside this nested well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill each well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

TA-52(test Hole) NW-1 (Well 1)	2	97	2	16
TA-52(test Hole) NW-1 (Well 2)	2	97	2	16
Totals:			4	32

3. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

4. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the test well.

5. All surface completions (vaults) will be removed, if applicable. Casing will be terminated 1'- 2' bgs and the remaining hole will be backfilled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plans of Operations dated May 20, 2015, are hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

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(1)

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 11:41:39

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: US DOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	35.5 Seconds	N
Longitude:	106 Degrees	17 Minutes	16.5 Seconds	W

Universal Transverse Mercator Zone: 13N

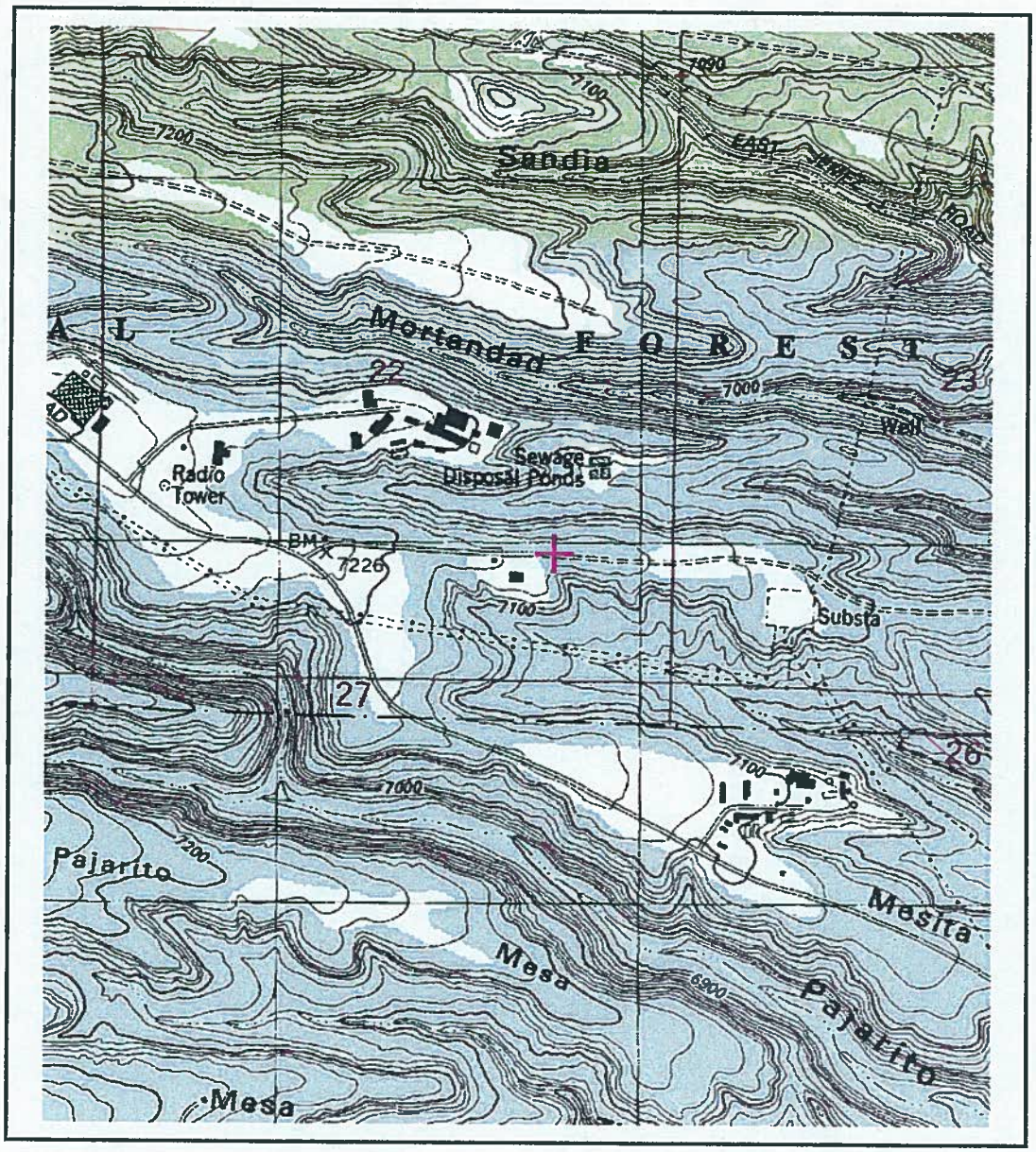
NAD 1983(92) (Meters)	N: 3,969,170	E: 383,714
NAD 1983(92) (Survey Feet)	N: 13,022,187	E: 1,258,903
NAD 1927 (Meters)	N: 3,968,973	E: 383,659
NAD 1927 (Survey Feet)	N: 13,021,540	E: 1,258,722

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 538,965	E: 496,575
NAD 1983(92) (Survey Feet)	N: 1,768,255	E: 1,629,180
NAD 1927 (Meters)	N: 538,951	E: 148,923
NAD 1927 (Survey Feet)	N: 1,768,210	E: 488,590

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:19,887

Northing/Easting: UTM83(92) (Meter): N: 3,969,170 E: 383,714

Northing/Easting: SPCS83(92) (Feet): N: 1,768,255 E: 1,629,180

GW Basin: Rio Grande

Print Date: 05/21/2015

RG-
RN-569619

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TA-52 Test Hole NW-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1629180.3
North: 1768254.8

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: TA-52 Test Hole NW-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 97.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Steel/plastic tubing

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 87 to 97 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe: The borehole has a 6-in. diameter surface casing cemented into the top of tuff.

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The surface casing and casing strings are cemented in place from ground surface to 87 ft. Therefore, TA-52 Test Hole NW-1 will not be overdrilled. The casings will be pressure grouted with neat cement from total depth to surface via tremie pipe. A concrete mound will be emplaced above the existing grade.

2) Will well head be cut-off below land surface after plugging? The surface casing and well head will be cut off before sealing to ground surface.

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: Approximately 31.6 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

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7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

TA-52 test hole NW-1 was drilled in 1964 and is constructed with two casing strings of plastic tubing to 97 ft bgl with perforated holes from 87 to 97 ft bgl and 2-in. diameter steel casing at surface. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett 5-20-15

Signature of Applicant Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

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

Witness my hand and official seal this 6TH day of JULY, 2015

TOM BLAINE P.E.
~~Scott A. Verhines~~, State Engineer

By: [signature]

STATE ENGINEER · STATE OF NEW MEXICO · GREAT SEAL OF THE STATE OF NEW MEXICO · 1912

2015 MAY 20 AM 8:49

OFFICE OF STATE ENGINEER SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			97
Theoretical volume of grout required per interval (gallons)			31.6 ok CT
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95352

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested test well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the surface casing and casing strings are cemented in from ground surface to 87-feet. Therefore, TA-52 Test Hole NW-1 will not be overdrilled. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used a part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95352 Test well SE-1 (two wells)	2	97.0	35°51'35.2"	106°17'16.2"

Specific Plugging Conditions of Approval for 1 nested test well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Theoretical volume of sealant required for abandonment of each of the 2-inch (inside) diameter wells inside this nested well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill each well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
TA-52(test Hole) SE-1 (Well 1)	2	97	2	16
TA-52(test Hole) SE-1 (Well 2)	2	97	2	16
Totals:			4	32

3. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

4. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the test well.

5. All surface completions (vaults) will be removed, if applicable. Casing will be terminated 1'-2' bgs and the remaining hole will be backfilled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

STATE ENGINEER
STATE OF NEW MEXICO
SEAL OF THE STATE OF NEW MEXICO
GREAT SEAL OF THE STATE OF NEW MEXICO 1912

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 13:14:00

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	35.2 Seconds	N
Longitude:	106 Degrees	17 Minutes	16.2 Seconds	W

Universal Transverse Mercator Zone: 13N

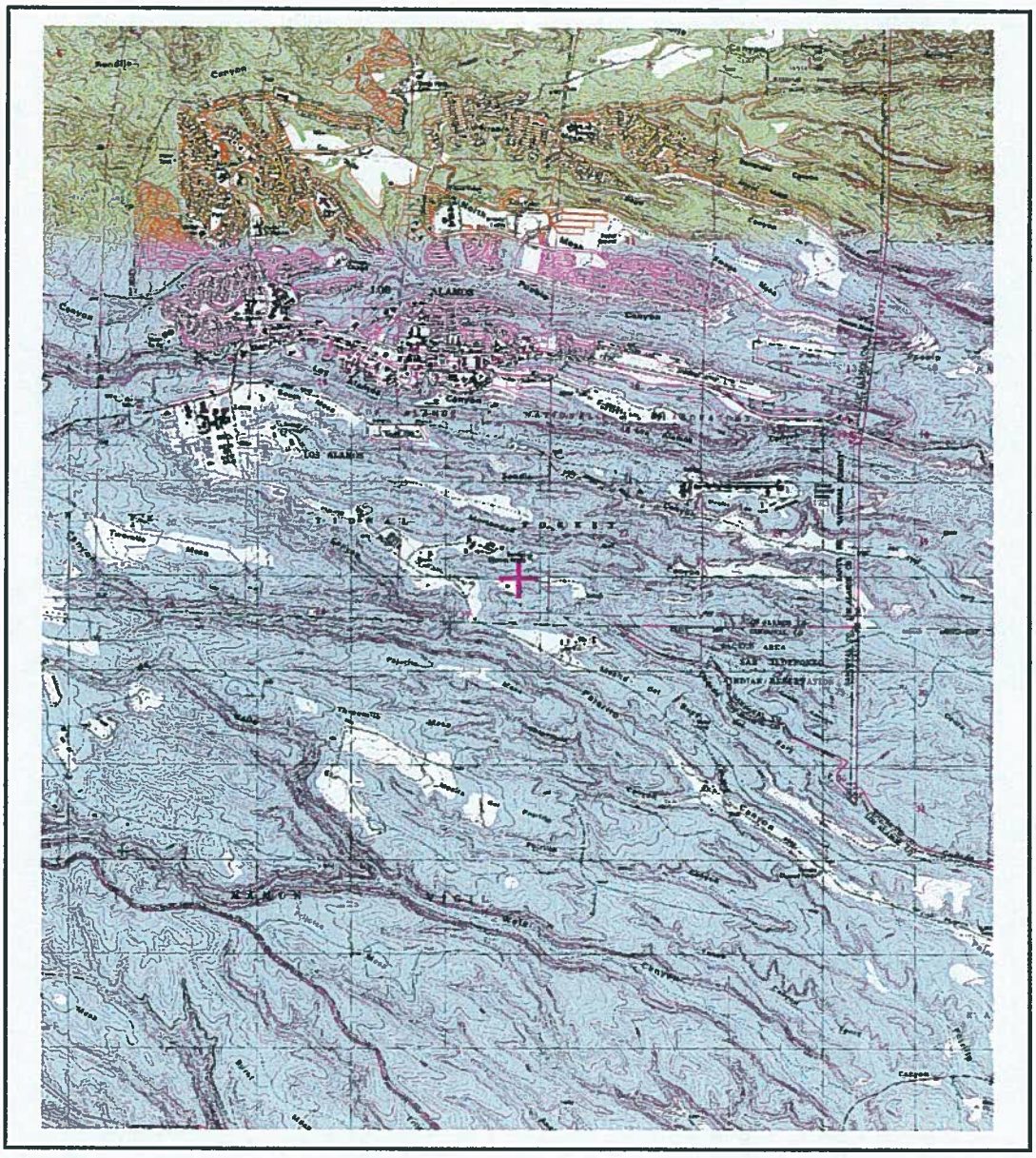
NAD 1983(92) (Meters)	N: 3,969,161	E: 383,723
NAD 1983(92) (Survey Feet)	N: 13,022,156	E: 1,258,932
NAD 1927 (Meters)	N: 3,968,964	E: 383,668
NAD 1927 (Survey Feet)	N: 13,021,510	E: 1,258,750

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 538,956	E: 496,584
NAD 1983(92) (Survey Feet)	N: 1,768,225	E: 1,629,209
NAD 1927 (Meters)	N: 538,942	E: 148,931
NAD 1927 (Survey Feet)	N: 1,768,180	E: 488,619

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:76,536

Northing/Easting: UTM83(92) (Meter): N: 3,969,161 E: 383,723

Northing/Easting: SPCS83(92) (Feet): N: 1,768,225 E: 1,629,209

GW Basin: Rio Grande

Print Date: 05/21/2015

RG-9533 2
TRN-569623

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TA-52 Test Hole SE-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1629209.4
North: 1768225.1
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: TA-52 Test Hole SE-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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SANTA FE, NEW MEXICO

6) Depth of the well: 97.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Steel/plastic tubing

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 87 to 97 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe: The borehole has a 6-in. diameter surface casing cemented into the top of tuff.

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The surface casing and casing strings are cemented in place from ground surface to 87 ft. Therefore, TA-52 Test Hole SE-1 will not be overdrilled. The casings will be pressure grouted with neat cement from total depth to surface via tremie pipe. A concrete mound will be emplaced above the existing grade.

2) Will well head be cut-off below land surface after plugging? The surface casing and well head will be cut off before sealing to ground surface.

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: Approximately 31.6 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

TA-52 test hole SE-1 was drilled in 1964 and is constructed with two casing strings of plastic tubing to 97 ft bgl with perforated holes from 87 to 97 ft bgl and 2-in. diameter steel casing at surface. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett , say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6TH day of JULY, 2015

TOM BLAINE, P.E.
~~Scott A. Verhines~~, State Engineer

By: [signature]

STATE ENGINEER · STATE OF NEW MEXICO · SEAL OF THE STATE OF NEW MEXICO · GRANT OF 1912

2015 MAY 20 AM 8:51

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			97
Theoretical volume of grout required per interval (gallons)			31.6 ok CP
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95353

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested test well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the 6-inch surface casing and 2-inch casing strings are cemented in from ground surface to 87-feet. Therefore, TA-52 Test Hole I will not be overdrilled. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used a part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95353 Test Hole I (two wells)	2	97.0	35°51'35.4"	106°17'16.3"

Specific Plugging Conditions of Approval for 1 nested test well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Theoretical volume of sealant required for abandonment of each of the 2-inch (inside) diameter wells inside this nested well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill each well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
TA-52(Test Hole) I (Well 1)	2	97	2	16
TA-52(Test Hole) I (Well 2)	2	97	2	16
Totals:			4	32

3. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

4. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the test well.

5. All surface completions (vaults) will be removed, if applicable. Casing will be terminated 1'- 2' bgs and the remaining hole will be backfilled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Christopher M. Thornburg, NMOSE District 6, Water Rights Division Date: July 6, 2015

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 13:23:32

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	35.4 Seconds	N
Longitude:	106 Degrees	17 Minutes	16.3 Seconds	W

Universal Transverse Mercator Zone: 13N

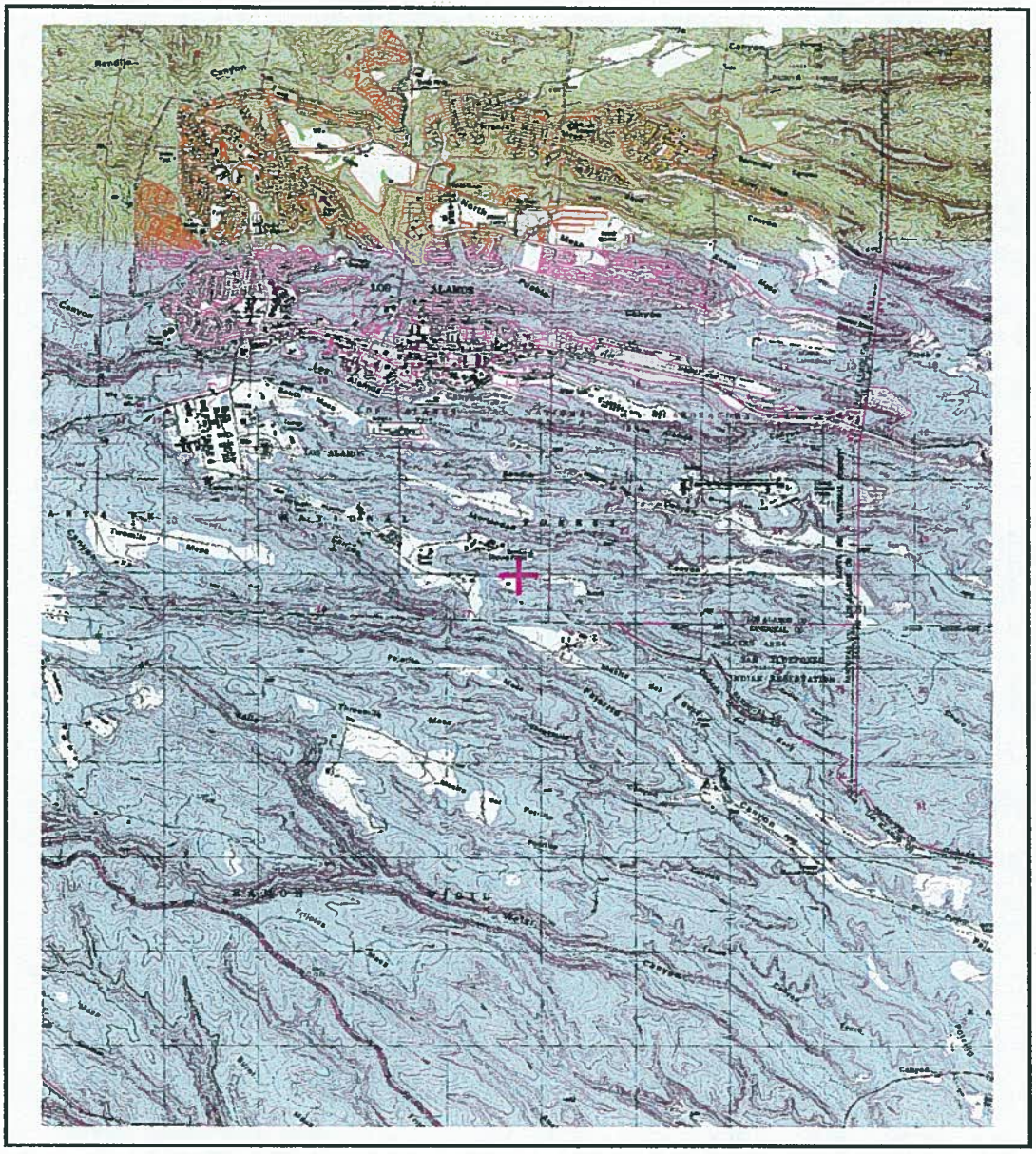
NAD 1983(92) (Meters)	N: 3,969,166	E: 383,720
NAD 1983(92) (Survey Feet)	N: 13,022,173	E: 1,258,921
NAD 1927 (Meters)	N: 3,968,969	E: 383,665
NAD 1927 (Survey Feet)	N: 13,021,526	E: 1,258,739

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 538,961	E: 496,581
NAD 1983(92) (Survey Feet)	N: 1,768,241	E: 1,629,198
NAD 1927 (Meters)	N: 538,947	E: 148,928
NAD 1927 (Survey Feet)	N: 1,768,196	E: 488,608

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:76,536

Northing/Easting: UTM83(92) (Meter): N: 3,969,166 E: 383,720

Northing/Easting: SPCS83(92) (Feet): N: 1,768,241 E: 1,629,198

GW Basin: Rio Grande

Print Date: 05/21/2015

KG-95555
TRN-569624

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TA-52 Test Hole I

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1629198.4
North: 1768240.8

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: TA-52 Test Hole I is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 97.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Steel/plastic tubing

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 87 to 97 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe: The borehole has a 6-in. diameter surface casing cemented into the top of tuff.

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The surface casing and casing strings are cemented in place from ground surface to 87 ft. Therefore, TA-52 Test Hole I will not be overdrilled. The casings will be pressure grouted with neat cement from total depth to surface via tremie pipe. A concrete mound will be emplaced above the existing grade.

2) Will well head be cut-off below land surface after plugging? The surface casing and well head will be cut off before sealing to ground surface.

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: Approximately 31.6 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

TA-52 test hole I was drilled in 1964 and is constructed with two casing strings of plastic tubing to 97 ft bgl with perforated holes from 87 to 97 ft bgl and 6-in. diameter steel casing at surface. All surface appurtenances will be removed from around the casing before it is abandoned. 6-3N

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — 5-20-15

Signature of Applicant — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

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

Witness my hand and official seal this 6TH day of July, 2015

TOM BLAINE, P.E.
~~Scott A. Verhines~~, State Engineer

By: [signature]

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			97
Theoretical volume of grout required per interval (gallons)			31.6 ok CT
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95354

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested test well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the 6-inch surface casing and 2-inch casing strings are cemented in from ground surface to 150-feet. Therefore, TA-52 Test Hole NE-1 will not be overdrilled. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95354 Test Hole NE-1 (two wells)	2	170 & 291	35°51'35.5"	106°17'16.2"

Specific Plugging Conditions of Approval for 1 nested test well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Theoretical volume of sealant required for abandonment of each of the 2-inch (inside) diameter wells inside this nested well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill each well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
TA-52(Test Hole) NE-1 (Well 1)	2	170	4	28
TA-52(Test Hole) NE-1 (Well 2)	2	291	6	47
Totals:			10	75

3. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

4. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the test well.

5. All surface completions (vaults) will be removed, if applicable. Casing will be terminated 1'- 2' bgs and the remaining hole will be backfilled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thomburg, NMOSE District 6, Water Rights Division

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Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 13:41:57

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	35.5 Seconds	N
Longitude:	106 Degrees	17 Minutes	16.2 Seconds	W

Universal Transverse Mercator Zone: 13N

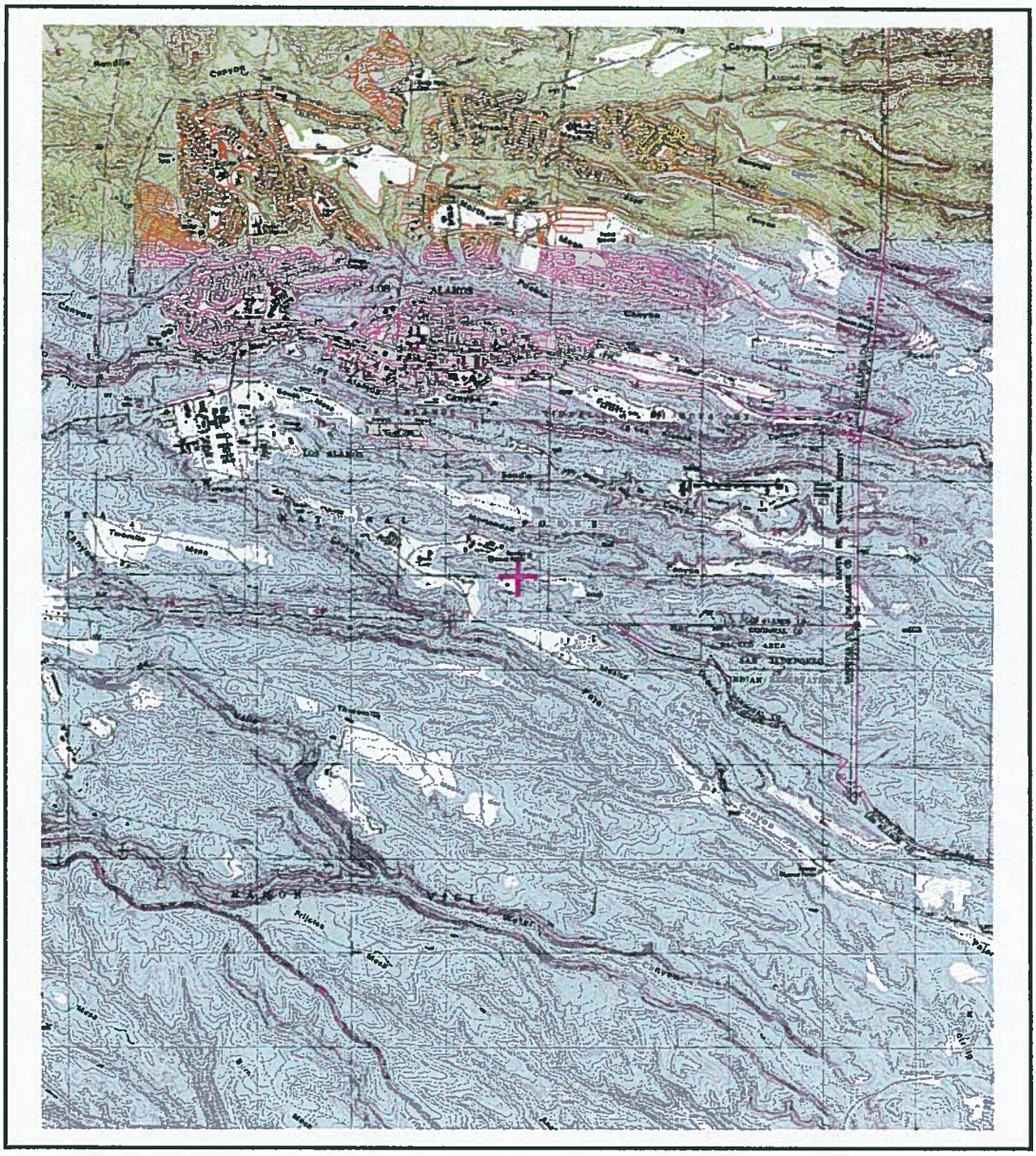
NAD 1983(92) (Meters)	N: 3,969,172	E: 383,723
NAD 1983(92) (Survey Feet)	N: 13,022,190	E: 1,258,932
NAD 1927 (Meters)	N: 3,968,975	E: 383,668
NAD 1927 (Survey Feet)	N: 13,021,544	E: 1,258,751

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 538,966	E: 496,584
NAD 1983(92) (Survey Feet)	N: 1,768,259	E: 1,629,209
NAD 1927 (Meters)	N: 538,953	E: 148,931
NAD 1927 (Survey Feet)	N: 1,768,214	E: 488,619

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:76,536

Northing/Easting: UTM83(92) (Meter): N: 3,969,172 E: 383,723

Northing/Easting: SPCS83(92) (Feet): N: 1,768,259 E: 1,629,209

GW Basin: Rio Grande

Print Date: 05/21/2015

KG-11334
TRN-569625

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TA-52 Test Hole NE-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1629208.7
North: 1768259.4

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: TA-52 Test Hole NE-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 170.0 and 291.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Steel/plastic tubing

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 160 to 170 ft bgl, and 272 to 291 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe: The borehole has a 6-in. diameter surface casing cemented into the top of tuff.

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The surface casing and casing strings are cemented in place from ground surface to 150 ft. Therefore, TA-52 Test Hole NE-1 will not be overdrilled. The casings will be pressure grouted with neat cement from total depth to surface via tremie pipe. A concrete mound will be emplaced above the existing grade.

2) Will well head be cut-off below land surface after plugging? The surface casing and well head will be cut off before sealing to ground surface.

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: Approximately 27.7 and 47.4 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

TA-52 test hole NE-1 was drilled in 1964 and is constructed with two casing strings of plastic tubing to 170 and 291 ft bgl with perforated holes from 160 to 170 ft bgl and 272 to 291 ft bgl, respectively, and ~~2~~ 6 in. diameter steel casing at surface. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6TH day of JULY, 2015

TOM BLAWE P.E.
~~Scott A. Verhines,~~ State Engineer

By: [signature]

STATE ENGINEER · STATE OF NEW MEXICO · SEAL OF THE STATE OF NEW MEXICO

2015 MAY 20 AM 8:59

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			170 and 291
Theoretical volume of grout required per interval (gallons)			27.7 and 47.4 ok CT
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95355

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested test well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the 6-inch surface casing and 2-inch casing strings are cemented in from ground surface to 87-feet. Therefore, TA-52 Test Hole NE-2 will not be overdrilled. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used a part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95355 Test Hole NE-2 (two wells)	2	97.0	35°51'35.5"	106°17'16.0"

Specific Plugging Conditions of Approval for 1 nested test well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Theoretical volume of sealant required for abandonment of each of the 2-inch (inside) diameter wells inside this nested well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill each well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
TA-52(Test Hole) NE-2 (Well 1)	2	97	2	16
TA-52(Test Hole) NE-2 (Well 2)	2	97	2	16
Totals:			4	32

3. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

4. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the test well.

5. All surface completions (vaults) will be removed, if applicable. Casing will be terminated 1'- 2' bgs and the remaining hole will be backfilled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

Date: July 6, 2015

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 13:53:37

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	35.5 Seconds	N
Longitude:	106 Degrees	17 Minutes	16.0 Seconds	W

Universal Transverse Mercator Zone: 13N

NAD 1983(92) (Meters)	N: 3,969,170	E: 383,727
NAD 1983(92) (Survey Feet)	N: 13,022,186	E: 1,258,943
NAD 1927 (Meters)	N: 3,968,973	E: 383,671
NAD 1927 (Survey Feet)	N: 13,021,540	E: 1,258,762

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 538,965	E: 496,587
NAD 1983(92) (Survey Feet)	N: 1,768,255	E: 1,629,220
NAD 1927 (Meters)	N: 538,951	E: 148,935
NAD 1927 (Survey Feet)	N: 1,768,210	E: 488,630

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

RG-95355
TRN-569639

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TA-52 Test Hole NE-2

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1629219.7
North: 1768254.8
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: TA-52 Test Hole NE-2 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 97.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: Steel/plastic tubing

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 87 to 97 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? Yes If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? Yes If yes, please describe: The borehole has a 6-in. diameter surface casing cemented into the top of tuff.

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The surface casing and casing strings are cemented in place from ground surface to 87 ft. Therefore, TA-52 Test Hole NE-2 will not be overdrilled. The casings will be pressure grouted with neat cement from total depth to surface via tremie pipe. A concrete mound will be emplaced above the existing grade.

2) Will well head be cut-off below land surface after plugging? The surface casing and well head will be cut off before sealing to ground surface.

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: Approximately 31.6 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

TA-52 test hole NE-2 was drilled in 1964 and is constructed with two casing strings of plastic tubing to 97 ft bgl with perforated holes from 87 to 97 ft bgl and 2-in. diameter steel casing at surface. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6TH day of JULY, 2015

TOM BLAINE, PE

~~Scott A. Verhines~~, State Engineer

By: [signature]

STATE ENGINEER SEAL OF THE STATE OF NEW MEXICO GREAT SEAL 1912

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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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			97
Theoretical volume of grout required per interval (gallons)			31.6 ok CT
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

2015 MAY 20 AM 9:02

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

Locator Tool Report

General Information:

Application ID: Move-From Date: 07-06-2015 Time: 09:47:17

WR File Number: LRG-01939-POD1
Purpose: POINT OF DIVERSION

Applicant First Name: KENNETH
Applicant Last Name: NEEDHAM

GW Basin: LOWER RIO GRANDE
County: DONA ANA

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - LRG
Special Condition Area Name(s): NONE
Land Grant Name: MESILLA CIVIL COLONY

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	32 Degrees	17 Minutes	48.8 Seconds	N
Longitude:	106 Degrees	50 Minutes	13.9 Seconds	W

Universal Transverse Mercator Zone: 13N

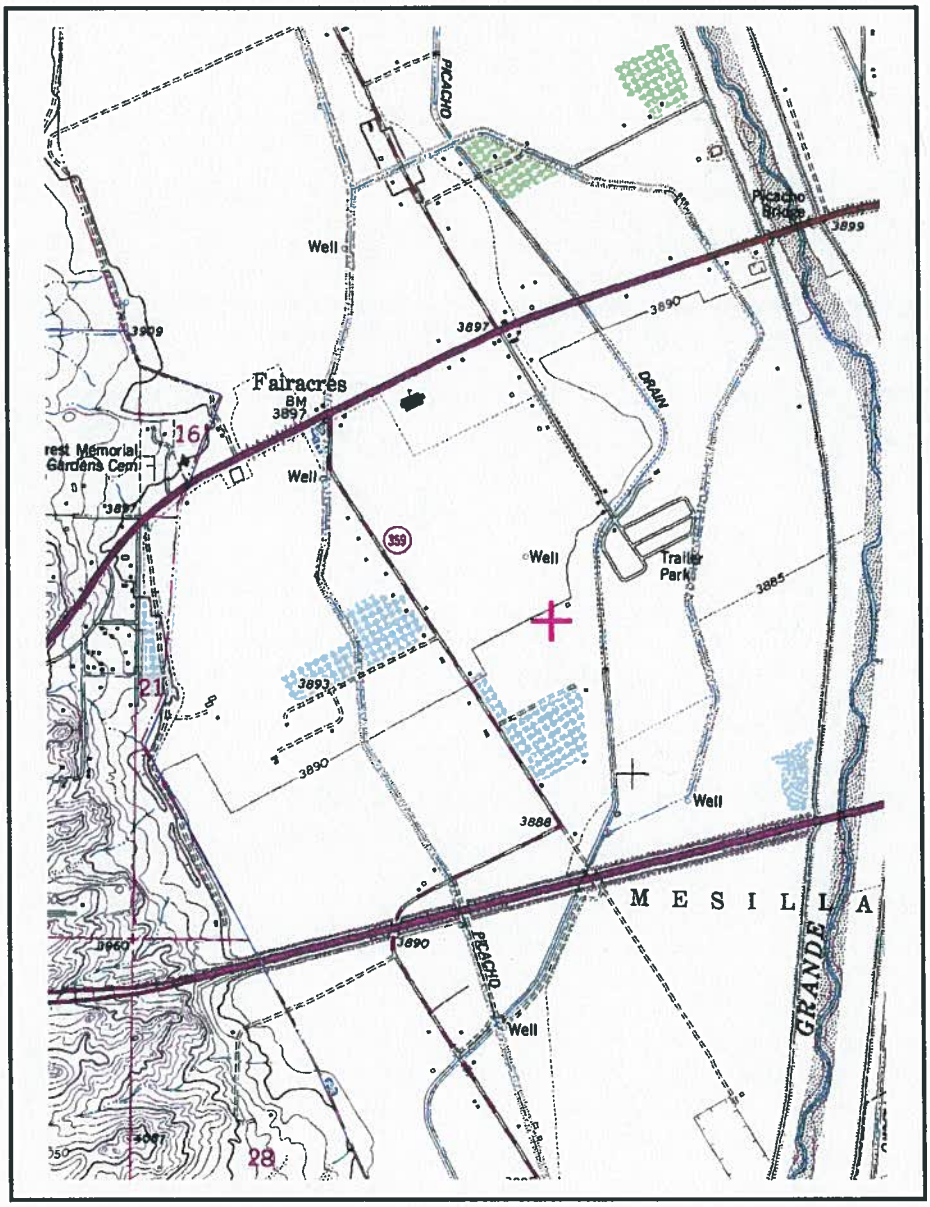
NAD 1983(92) (Meters)	N: 3,574,828	E: 327,015
NAD 1983(92) (Survey Feet)	N: 11,728,414	E: 1,072,882
NAD 1927 (Meters)	N: 3,574,650	E: 326,959
NAD 1927 (Survey Feet)	N: 11,727,830	E: 1,072,697

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 143,938	E: 444,698
NAD 1983(92) (Survey Feet)	N: 472,237	E: 1,458,980
NAD 1927 (Meters)	N: 143,943	E: 97,044
NAD 1927 (Survey Feet)	N: 472,255	E: 318,386

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: LRG-01939-POD$cale: 1:28,743

Northing/Easting: UTM83(92) (Meter): N: 3,574,828 E: 327,015

Northing/Easting: SPCS83(92) (Feet): N: 472,237 E: 1,458,980

GW Basin: Lower Rio Grande

Print Date: 07/06/2015

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95359

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 alluvial well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the casing will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95359 Alluvial Well	2	40.0	35°51'37.8"	106°16'25.5"

Specific Plugging Conditions of Approval for 1 alluvial well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of plugging of the lower portion of the 2" well to the approximate 20 foot bgs depth of actual overdrilling, the top of the 2" casing shall be severed within the bottom of the 4 ¼" X 7 ½" auger flights prior to sealant being placed within the ID of the augers.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7 ½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
TSWB-6 Alluvial Well	2	20	0	3
TSWB-6 Alluvial Well (Auger Boring)	7.5	20	6	46
Totals:			7	49

6. All surface completions (vaults) will be removed, if applicable. The top of the 2" casing will be severed within the bottom of the 4 ¼" x 7 ½" augers and the overdrilled hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

Date: July 6, 2015

STATE ENGINEER · STATE OF NEW MEXICO · SEAL

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 14:11:07

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	37.8 Seconds	N
Longitude:	106 Degrees	16 Minutes	25.5 Seconds	W

Universal Transverse Mercator Zone: 13N

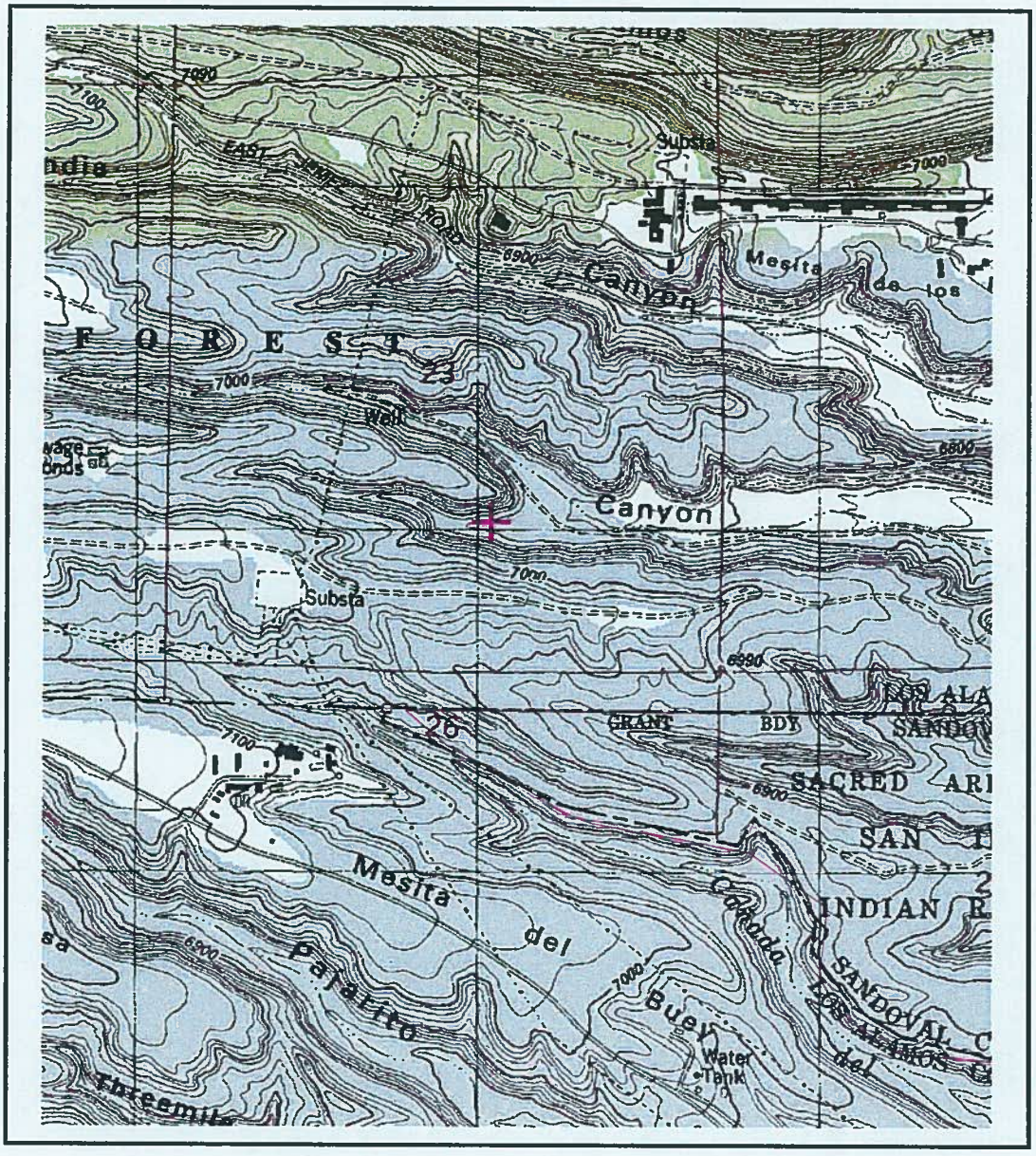
NAD 1983(92) (Meters)	N: 3,969,226	E: 384,996
NAD 1983(92) (Survey Feet)	N: 13,022,369	E: 1,263,108
NAD 1927 (Meters)	N: 3,969,029	E: 384,941
NAD 1927 (Survey Feet)	N: 13,021,723	E: 1,262,927

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 539,037	E: 497,856
NAD 1983(92) (Survey Feet)	N: 1,768,491	E: 1,633,383
NAD 1927 (Meters)	N: 539,023	E: 150,204
NAD 1927 (Survey Feet)	N: 1,768,446	E: 492,794

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:21,093

Northing/Easting: UTM83(92) (Meter): N: 3,969,226 E: 384,996

Northing/Easting: SPCS83(92) (Feet): N: 1,768,491 E: 1,633,383

GW Basin: Rio Grande

Print Date: 05/21/2015

KG-70007
TRN-569735

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: TSWB-6

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1633383.1
North: 1768490.8
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: Alluvial well TSWB-6 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s): _____

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

6) Depth of the well: 40.0 feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 25 to 35 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 49.2 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Alluvial well TSWB-6 was drilled in 1994 and is constructed with 40 ft of 2-in. diameter PVC casing with a screen from 25 to 35 ft bgl. All surface appurtenances will be removed from around the casing before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6TH day of July, 2015

TOM BLAINE, P.E.
~~Scott A. Verhines~~, State Engineer

By: [signature]

STATE ENGINEER SEAL OF THE STATE OF NEW MEXICO STATE OF NEW MEXICO

2015 MAY 20 AM 8:55

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			40
Theoretical volume of grout required per interval (gallons)			49.2 ok CJ
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

2015 MAY 20 AM 8:55

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95360

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the well will be pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The well will then be overdrilled with 7.5-inch (outside diameter) 4 ¼" (inside diameter) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This test well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95360	2	69.7	35°53'20.9"	106°14'57.2"

Specific Plugging Conditions of Approval for 1 well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Upon completion of plugging of the lower portion of the 2" well to the approximate 20 foot bgs depth of actual overdrilling, the top of the 2" casing shall be severed within the bottom of the 4 ¼" X 7 ½" augers prior to sealant being placed within the ID of the augers.

4. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 7 ½" 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 4 ¼" x 7 ½" augers may not be pulled out of the hole prior to the sealant being placed.

5. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 7 ½" (outside) diameter auger boring is 2.3 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
BCO-1	2	49.7	1	8
BCO-1 (Auger Boring)	7.5	20	6	46
Totals:			7	54

6. All surface completions (vaults) will be removed, if applicable. The top of the 2" casing will be severed within the bottom of the 4 ¼" x 7 ½" augers and the overdrilled hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

7. 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 plugging process.

8. 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 dependant on personnel availability.

9. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf) 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

10. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

STATE ENGINEER · STATE OF NEW MEXICO · SEAL OF THE STATE OF NEW MEXICO · GREAT SEAL · 1912

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 15:32:38

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	53 Minutes	20.9 Seconds	N
Longitude:	106 Degrees	14 Minutes	57.2 Seconds	W

Universal Transverse Mercator Zone: 13N

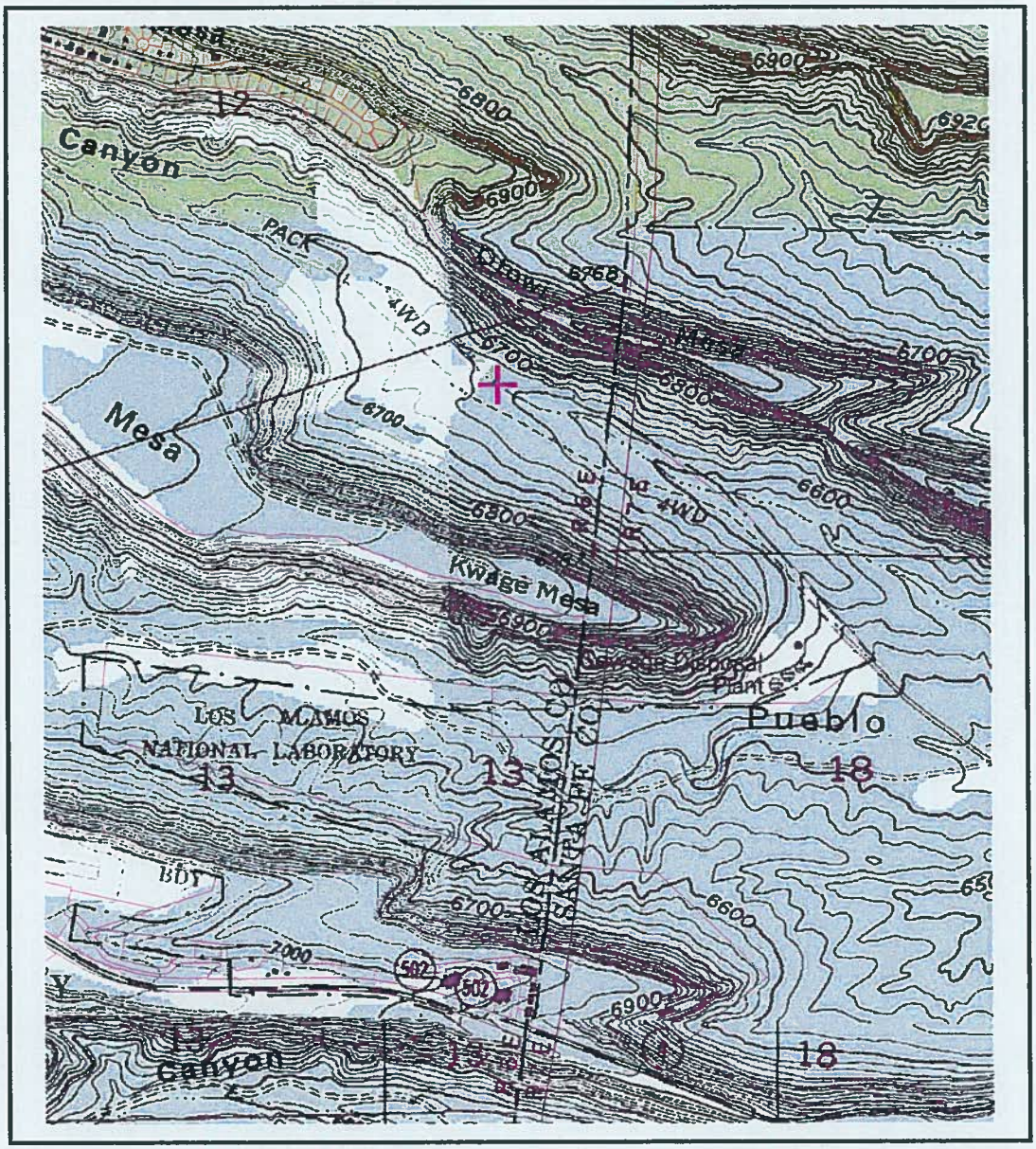
NAD 1983(92) (Meters)	N: 3,972,374	E: 387,251
NAD 1983(92) (Survey Feet)	N: 13,032,698	E: 1,270,506
NAD 1927 (Meters)	N: 3,972,178	E: 387,196
NAD 1927 (Survey Feet)	N: 13,032,053	E: 1,270,325

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 542,214	E: 500,071
NAD 1983(92) (Survey Feet)	N: 1,778,915	E: 1,640,649
NAD 1927 (Meters)	N: 542,201	E: 152,419
NAD 1927 (Survey Feet)	N: 1,778,871	E: 500,060

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:17,850

Northing/Easting: UTM83(92) (Meter): N: 3,972,374 E: 387,251

Northing/Easting: SPCS83(92) (Feet): N: 1,778,915 E: 1,640,649

GW Basin: Rio Grande

Print Date: 05/21/2015

KG-95360
TRN-569738

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: BCO-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1640648.7
North: 1778914.7
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: BCO-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

2015 MAY 20 AM 8:57
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6) Depth of the well: 68 (completion record), 69.7 (recent LANL video log) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 57-67 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The casing will be pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The well will then be overdrilled with 7.5-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut off and drilled out before sealing to ground surface.

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: Approximately 54.0 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

BCO-1 was drilled to 70 ft bgl in 1994. The well is constructed with 70 ft of 2-in. diameter PVC casing with a screened interval from 57 to 67 ft bgl. All surface appurtenances will be removed from around the well before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

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

Witness my hand and official seal this 17th day of July, 2015

Tom Blaine P.E.
~~Scott A. Verhines~~, State Engineer

By:

STATE ENGINEER OF NEW MEXICO · SEAL OF THE STATE OF NEW MEXICO · GREAT SEAL · 1912

2015 MAY 20 AM 8:57

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			69.7
Theoretical volume of grout required per interval (gallons)			54.0
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations Conditions of Approval for RG-95362

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested piezometer well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that each leg of the piezometer cluster will be individually pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-inch (outside diameter) 4 ¼" (inside diameter) (HD) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This piezometer well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95362 Nested Piezometer Well (3 Legs)	2	(A) 174 (B) >89 (C) >38	35°49'43.7"	106°15'15.9"

Specific Plugging Conditions of Approval for 1 Nested Piezometer Well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the piezometer well.

4. Upon completion of the plugging of the lower portion of the deeper 2" wells to approximately 20 foot bgs depth of actual overdrilling, the top of the 2" casing shall be severed within the bottom of the 4 ¼" x 8 ¼" HD augers prior to sealant being placed within the ID of the augers.

5. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 8 ¼" 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 4 ¼" x 8 ¼" augers may not be pulled out of the hole prior to the sealant being placed.

6. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 8 ¼" (outside) diameter auger boring is ~2.8 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
POTO-4 (A)	2	154	3	25
POTO-4 (B)	2	69	2	11
POTO-4 (C*)	2	18	0	3
POTO-4 (Auger Boring)	8.25	20	7	56
Totals:			13	95

7. All surface completions (vaults) will be removed, if applicable. The top of the 2" casings will be severed within the bottom of the 4 ¼" x 8 ¼" HD augers and the overdrilled hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

8. 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 plugging process.

9. 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 dependant on personnel availability.

10. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

11. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

_____ Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

Locator Tool Report

General Information:

Application ID: 29 Date: 05-28-2015 Time: 10:49:05

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: RAMON VIGIL

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	49 Minutes	43.7 Seconds	N
Longitude:	106 Degrees	15 Minutes	15.9 Seconds	W

Universal Transverse Mercator Zone: 13N

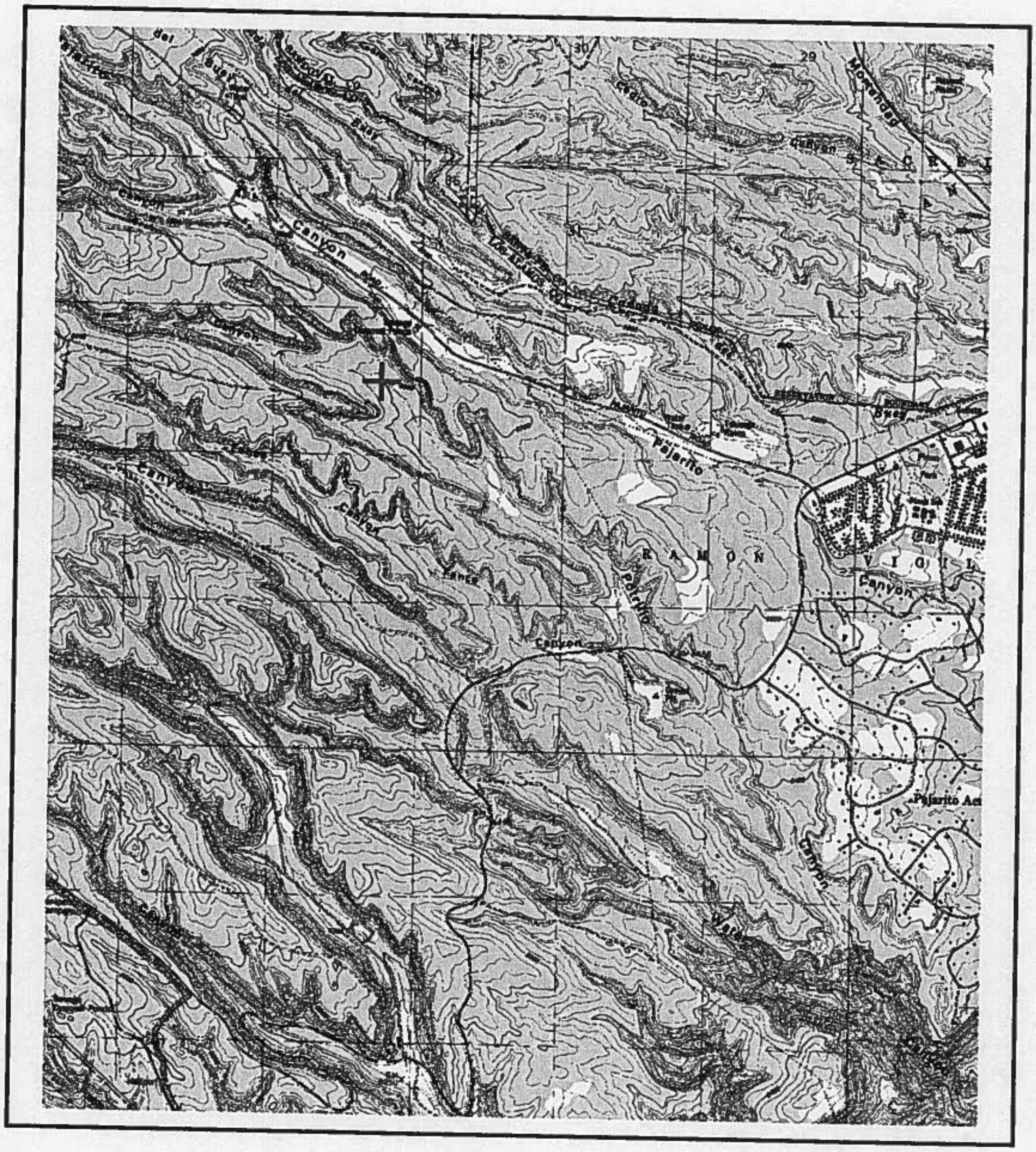
NAD 1983(92) (Meters)	N: 3,965,688	E: 386,695
NAD 1983(92) (Survey Feet)	N: 13,010,760	E: 1,268,680
NAD 1927 (Meters)	N: 3,965,491	E: 386,639
NAD 1927 (Survey Feet)	N: 13,010,113	E: 1,268,499

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 535,520	E: 499,600
NAD 1983(92) (Survey Feet)	N: 1,756,952	E: 1,639,104
NAD 1927 (Meters)	N: 535,506	E: 151,948
NAD 1927 (Survey Feet)	N: 1,756,907	E: 498,515

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:48,211

Northing/Easting: UTM83(92) (Meter): N: 3,965,688 E: 386,695

Northing/Easting: SPCS83(92) (Feet): N: 1,756,952 E: 1,639,104

GW Basin: Rio Grande

RG-95362
TRN-569741

TRN # 569741

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: POTO-4A, B, C

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1639103.8
North: 1756952.4

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: The POTO-4A, B, C piezometer cluster is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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SANTA FE, NEW MEXICO

6) Depth of the well: 174 (A), >89 (B), >38 (C) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 154-164 ft bgl (A), 79-89 ft bgl (B), 28-38 ft bgl (C)

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The piezometers will be individually pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well heads will be cut off and drilled out before sealing to ground surface.

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: Approximately 94.8 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Test hole POTO-4 was drilled to 180 ft bgl in 1991. Three piezometers (A, B, and C) were installed in the test hole. POTO-4A piezometer is constructed with 174 ft of 2-in. diameter PVC casing with a screened interval from 154 to 164 ft bgl. POTO-4B piezometer is constructed with 2-in. diameter PVC casing below 89 ft bgl with a screened interval from 79 to 89 ft bgl. POTO-4C piezometer is constructed with 2-in. diameter PVC casing below 38 ft bgl with a screened interval from 28 to 38 ft bgl. All surface appurtenances will be removed from around the piezometers before they are abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

___X___ Approved subject to the attached conditions.

_____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6th day of July, 2015

TOM BLAINE P.E.

~~Scott A. Verhines~~, State Engineer

By: _____

2015 MAY 20 AM 9:00

OFFICE OF STATE ENGINEER
SANTA FE NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			174 (A), 89 (B), 38 (C)
Theoretical volume of grout required per interval (gallons)			94.8 ok CA
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

2015 MAY 20 AM 9:00

OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations Conditions of Approval for RG-95363

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested piezometer well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that each leg of the piezometer cluster will be individually pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-inch (outside diameter) 4 ¼" (inside diameter) (HD) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This piezometer well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95363 Nested Piezometer Well (2 Legs)	2	(A) 77.5 (B) >17	35°49'43.1"	106°15'15.0"

Specific Plugging Conditions of Approval for 1 Nested Piezometer Well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Each individual well inside the nested cluster shall be abandoned separately (The 17' leg of the cluster will be completely excavated and removed by the overdrill operation). The volumes for each

individual well inside the nested cluster shall be reported separately on the well plugging record for the piezometer well.

4. Upon completion of plugging of the lower portion of the deeper 2" piezometer well to approximately 20 foot bgs of actual overdrilling, the top of the 2-inch casing shall be severed within the bottom of the 4 ¼" x 8 ¼" HD augers prior to sealant being placed within the ID of the augers.

5. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 8 ¼" 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 4 ¼" x 8 ¼" augers may not be pulled out of the hole prior to the sealant being placed.

6. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 8 ¼" (outside) diameter auger boring is ~2.8 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
POTO-5 (A)	2	57.5	1	9
POTO-5 (Auger Boring)	8.25	20	7	56
Totals:			9	65

7. All surface completions (vaults) will be removed, if applicable. The top of the 2" casing shall be severed within the bottom of the 4 ¼" x 8 ¼" HD augers and the overdrilled hole will be backfilled with sealant to 2 foot bgs. The remaining 2 foot will be filled with concrete to surface.

8. 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 plugging process.

9. 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 dependant on personnel availability.

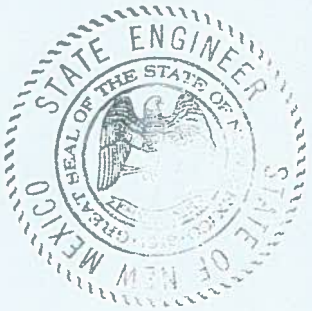
10. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf itemizing actual abandonment process and materials used shall be filed with the State Engineer (NMOSE, P.O. Box 25102 - 407 Galisteo Street - Room 102, Santa Fe, NM 87504-5102), within 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

11. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

_____ Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division



Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 13:36:29

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: RAMON VIGIL

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	49 Minutes	43.1 Seconds	N
Longitude:	106 Degrees	15 Minutes	15.0 Seconds	W

Universal Transverse Mercator Zone: 13N

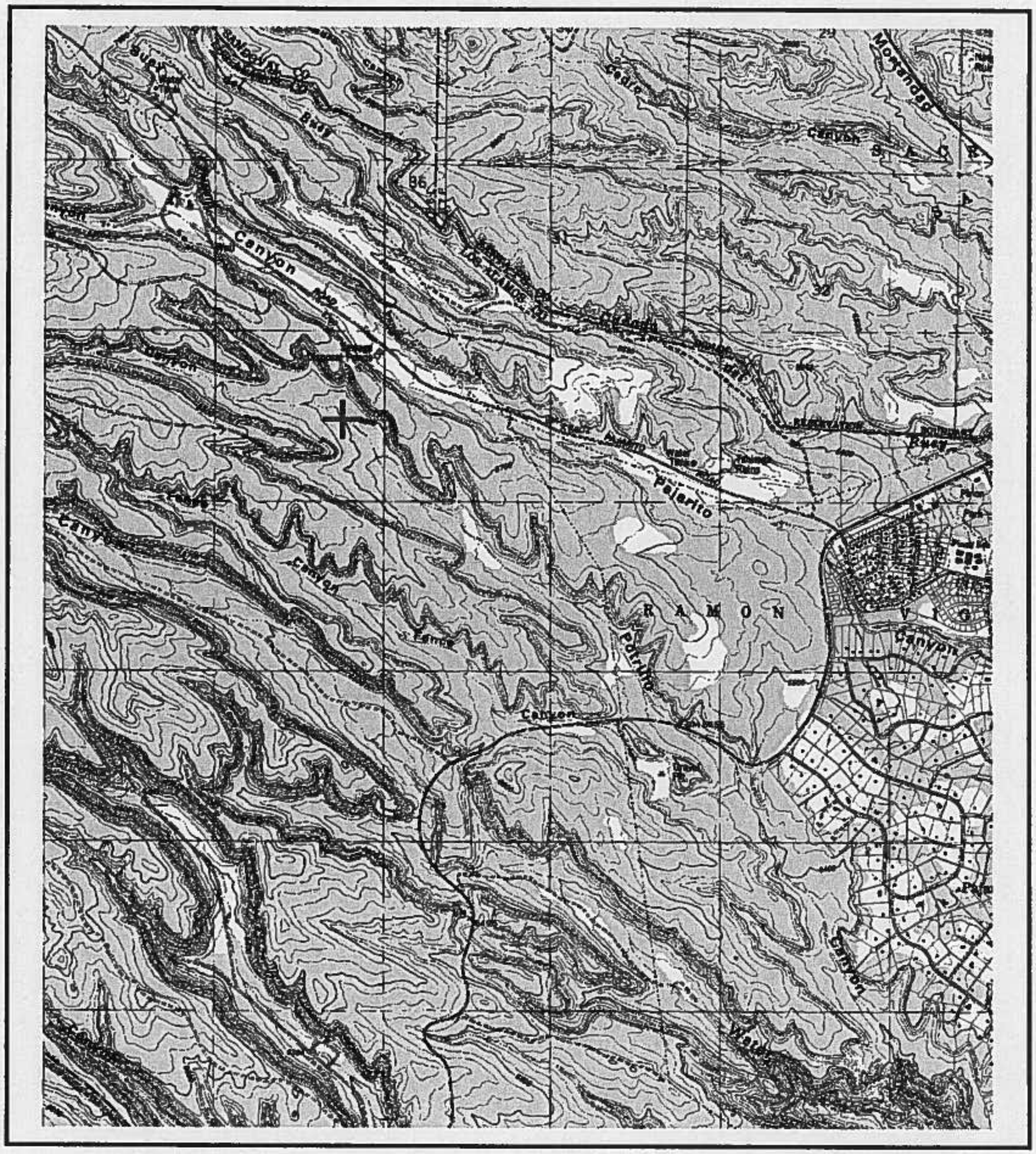
NAD 1983(92) (Meters)	N: 3,965,669	E: 386,718
NAD 1983(92) (Survey Feet)	N: 13,010,698	E: 1,268,759
NAD 1927 (Meters)	N: 3,965,472	E: 386,663
NAD 1927 (Survey Feet)	N: 13,010,052	E: 1,268,578

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 535,502	E: 499,624
NAD 1983(92) (Survey Feet)	N: 1,756,892	E: 1,639,183
NAD 1927 (Meters)	N: 535,488	E: 151,972
NAD 1927 (Survey Feet)	N: 1,756,847	E: 498,594

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:42,386

Northing/Easting: UTM83(92) (Meter): N: 3,965,669 E: 386,718

Northing/Easting: SPCS83(92) (Feet): N: 1,756,892 E: 1,639,183

GW Basin: Rio Grande

TRN-569742
RG-95363

WELL PLUGGING PLAN OF OPERATIONS

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

RG-95363
TRN-569742

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: POTO-5A, B

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1639183.1
North: 1756891.8

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: The POTO-5A, B piezometer cluster is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 77.5 (A), >17 (B) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 57.5-67.5 ft bgl (A), 7-17 ft bgl (B)

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The piezometers will be individually pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well heads will be cut off and drilled out before sealing to ground surface.

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: Approximately 64.9 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Test hole POTO-5 was drilled to 80 ft bgl in 1991. Two piezometers (A and B) were installed in the test hole. POTO-5A piezometer is constructed with 77.5 ft of 2-in. diameter PVC casing with a screened interval from 57.5 to 67.5 ft bgl. POTO-5B piezometer is constructed with 2-in. diameter PVC casing below 17 ft bgl with a screened interval from 7 to 17 ft bgl. All surface appurtenances will be removed from around the piezometers before they are abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett 5-20-15

Signature of Applicant Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

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

Witness my hand and official seal this 6th day of July, 2015

Tom Blaine, PE
Scott A. ~~Verhines~~, State Engineer

By: _____

STATE ENGINEER · STATE OF NEW MEXICO · GREAT SEAL OF THE STATE OF NEW MEXICO · 1912

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OFFICE OF STATE ENGINEER
SANTA FE, NEW MEXICO

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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			77.5 (A), 17 (B)
Theoretical volume of grout required per interval (gallons)			64.9 OK
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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SANTA FE, NEW MEXICO

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95364

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 nested piezometer well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that each leg of the piezometer cluster will be individually pressure grouted with neat cement from total depth to 20 feet below ground surface (bgs) via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-inch (outside diameter) 4 ¼" (inside diameter) (HD) augers to a minimum of 20 feet bgs. Neat cement will be used to fill the boring from 20 feet up to 2 feet bgs. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This piezometer well was not used as part of a monitoring program. Existing active wells that are in close proximity to the well(s) that are to be abandoned could possibly have communication during cementing operations. To reduce the likelihood of this scenario, the water to cement ratio can be reduced to 5.2 gallons of water per 94 pound sack of Portland cement.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95364 Nested Piezometer Well (2 Legs)	2	(East) 231, (West) 125	35°52'57.2"	106°15'13.6"

Specific Plugging Conditions of Approval for 1 Nested Piezometer Well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column.

3. Each individual well inside the nested cluster shall be abandoned separately. The volumes for each individual well inside the nested cluster shall be reported separately on the well plugging record for the piezometer well.

4. Upon completion of the plugging of the lower portion of the 2" piezometer well to approximately 20 foot bgs of actual overdrilling, the top of the 2 inch casing shall be severed within the bottom of the 4 ¼" x 8 ¼" HD augers prior to sealant being placed within the ID of the augers.

5. Sealant shall be kept up inside the augers during placement. The 4 ¼" x 8 ¼" 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 4 ¼" x 8 ¼" augers may not be pulled out of the hole prior to the sealant being placed.

6. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Theoretical volume of sealant required for abandonment of the 8 ¼" (outside) diameter auger boring is ~2.8 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
R-4 (East)	2	211	5	34
R-4 (West)	2	105	2	17
R-4 (Auger Boring)	8.25	20	7	56
Totals:			14	107

7. All surface completions (vaults) will be removed, if applicable. The top of the 2" casing will be severed within the bottom of the 4 ¼" x 8 ¼" HD augers and the overdrilled hole will be backfilled with sealant to 2 feet bgs. The remaining 2' will be filled with concrete to surface.

8. 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 plugging process.

9. 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 dependant on personnel availability.

10. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

11. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 15:52:59

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	52 Minutes	57.2 Seconds	N
Longitude:	106 Degrees	15 Minutes	13.6 Seconds	W

Universal Transverse Mercator Zone: 13N

NAD 1983(92) (Meters)	N: 3,971,649	E: 386,830
NAD 1983(92) (Survey Feet)	N: 13,030,318	E: 1,269,125
NAD 1927 (Meters)	N: 3,971,452	E: 386,775
NAD 1927 (Survey Feet)	N: 13,029,671	E: 1,268,944

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 541,483	E: 499,659
NAD 1983(92) (Survey Feet)	N: 1,776,517	E: 1,639,298
NAD 1927 (Meters)	N: 541,470	E: 152,007
NAD 1927 (Survey Feet)	N: 1,776,471	E: 498,709

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report

WR File Number: RG-00000 Scale: 1:76,536

Northing/Easting: UTM83(92) (Meter): N: 3,971,649 E: 386,830

Northing/Easting: SPCS83(92) (Feet): N: 1,776,517 E: 1,639,298

GW Basin: Rio Grande

Print Date: 05/21/2015

TRN-569744
RG-95364

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: R-4 Piezometers (East and West)

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1639297.6
North: 1776516.9

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: The R-4 piezometer cluster is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 231 (East), 125 (West) feet

7) Inside diameter of innermost casing: 2.0 inches.

8) Casing material: PVC

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 221-231 ft bgl (East), 115-125 ft bgl (West)

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The piezometers will be individually pressure grouted with neat cement from total depth to 20 ft bgl via tremie pipe. The piezometer cluster will then be overdrilled with 8.25-in. O.D. augers to a minimum of 20 ft bgl. Neat cement slurry will be used to fill the boring from 20 to 2 ft bgl. The top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well heads will be cut off and drilled out before sealing to ground surface.

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: Approximately 107 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Corehole R-4 was drilled to 233 ft bgl in 2004. Two piezometers (East and West) were installed in the corehole. The R-4 East piezometer is constructed with 231 ft of 2-in. diameter PVC casing with a screened interval from 221 to 231 ft bgl. The R-4 West piezometer is constructed with 125 ft of 2-in. diameter PVC casing with a screened interval from 115 to 125 ft bgl. All surface appurtenances will be removed from around the piezometers before they are abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett 5-20-15

Signature of Applicant Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

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

Witness my hand and official seal this 6TH day of July, 2015

TOM BLAINE P.E
~~Scott A. Verhines~~, State Engineer

By: [signature]

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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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			231 (East) and 125 (West)
Theoretical volume of grout required per interval (gallons)			107 OK CT
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER

Tom Blaine, P.E.
District 6 Office, Santa Fe, NM

Well Plugging Plan of Operations
Conditions of Approval for RG-95365

The U.S. Department of Energy / Los Alamos National Laboratory has identified 1 well as tabulated below. On the Well Plugging Plan of Operations received May 20, 2015, the applicant stated that the well is old and not used for its intended purpose and that the borehole represents a conduit to the subsurface for potential contaminants. The applicant states that the well will be pressure grouted with neat cement from total depth to 2 feet below ground surface (bgs) via tremie pipe. The top 2 feet will be filled with concrete and mounded above the existing grade. Static water level is dry, according to the applicant. There is no OSE File No. or historical record available for this test well. This well was not used as part of a monitoring program. Given the small diameter of the casing in this well, a reduction in water below 6 gallons per 94 pound sack of Portland Cement is not advised.

Location: Los Alamos, New Mexico.
Approximate well coordinates: See tabulated data.

Well Name	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-95365	1.1	825.6	35°51'52.3"	106°17'30.3"

Specific Plugging Conditions of Approval for 1 Well for the U.S. Department of Energy / Los Alamos National Laboratory, 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.

2. Placement of the sealant within the well shall be by pumping through a tremie pipe extended to near well bottom (based on sounding depth), and kept below top of the slurry column as the well is plugged from bottom-upwards in a manner that displaces the standing water column. An explanation of how this process was successfully achieved shall be required on the Well Plugging Record, upon completion of the well plugging.

3. All cement mixture will contain no more than 6 gallons of water per 94 pound sack of cement. Total minimum amount of required sealant will be based on the sounding depth inside casing.

4. Theoretical volume of sealant required for abandonment of the 1.1-inch (inside) diameter well is approximately .05 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below.

Well Name	Inside Diameter (Inches)	Total Depth (feet)	Volume (Cubic Feet)	Volume (Gallons)
MCOI-1	1.1	825.6	5	41
Totals:			5	41

5. All surface completions (vaults) will be removed, if applicable. The 1.1" casing will be terminated ~2 feet bgs and filled with concrete to surface.

6. 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 plugging process.

7. 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 dependant on personnel availability.

8. A Well Plugging Record (available at: http://www.ose.state.nm.us/STST/Forms/WD-11.pdf 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 20 days after completion of well plugging. Please attach a copy of these plugging conditions.

9. Although the applicant responses to plugging plan Section IV indicate that there may be a concern for contaminant travel through the old well(s) being plugged, applicant has not indicated that the well casing will be either pulled during tremie backfill or fully encapsulated in annular grout seal. The OSE does not have documentation that surface or subsurface contamination exists in the area, and takes at face value that the applicant's plugging intentions address known or surmised concerns regarding potential contaminant pathways. The plugging method proposed addresses the OSE's concern that overt comingling of aquifers or draining of surface water to aquifers is prevented by plugging the well casings.

The NMOSE Well Plugging Plan of Operations dated May 20, 2015, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: July 6, 2015

Christopher M. Thornburg, NMOSE District 6, Water Rights Division

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Locator Tool Report

General Information:

Application ID: 29 Date: 05-21-2015 Time: 14:07:36

WR File Number: RG-00000
Purpose: OTHER

Applicant First Name: USDOE
Applicant Last Name: LANL

GW Basin: RIO GRANDE
County: LOS ALAMOS

Critical Management Area Name(s): WATERS USE ONLY: SUBBASIN - NRG
Special Condition Area Name(s): NONE
Land Grant Name: NON GRANT

PLSS Description (New Mexico Principal Meridian):

PLSS description is not available for this location.

Coordinate System Details:

Geographic Coordinates:

Latitude:	35 Degrees	51 Minutes	52.3 Seconds	N
Longitude:	106 Degrees	17 Minutes	30.3 Seconds	W

Universal Transverse Mercator Zone: 13N

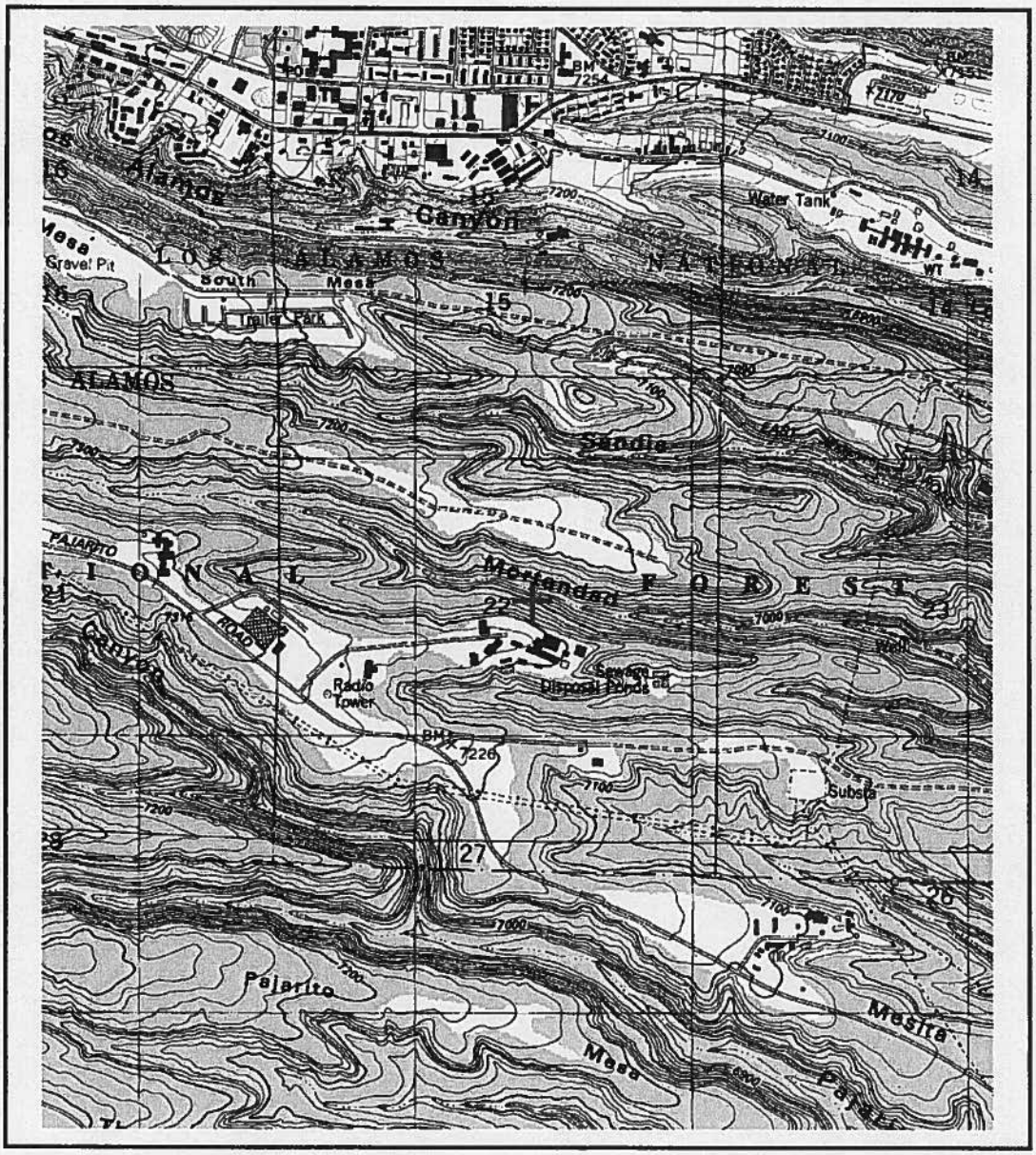
NAD 1983(92) (Meters)	N: 3,969,694	E: 383,375
NAD 1983(92) (Survey Feet)	N: 13,023,904	E: 1,257,789
NAD 1927 (Meters)	N: 3,969,491	E: 383,425
NAD 1927 (Survey Feet)	N: 13,023,237	E: 1,257,953

State Plane Coordinate System Zone: New Mexico Central

NAD 1983(92) (Meters)	N: 539,484	E: 496,229
NAD 1983(92) (Survey Feet)	N: 1,769,958	E: 1,628,044
NAD 1927 (Meters)	N: 539,466	E: 148,682
NAD 1927 (Survey Feet)	N: 1,769,896	E: 487,800

NEW MEXICO OFFICE OF STATE ENGINEER

Locator Tool Report



WR File Number: RG-00000 Scale: 1:26,115

Northing/Easting: UTM83(92) (Meter): N: 3,969,694 E: 383,375

Northing/Easting: SPCS83(92) (Feet): N: 1,769,958 E: 1,628,044

GW Basin: Rio Grande

Print Date: 05/21/2015

TRN-569751
RG-95365

WELL PLUGGING PLAN OF OPERATIONS

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

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

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: MCOI-1

Name of well owner: U.S. Department of Energy/Los Alamos National Laboratory

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

Phone number: 505-667-5931 E-mail: meverett@lanl.gov

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Geomechanics Southwest, Inc.

New Mexico Well Driller License No.: 1522 Expiration Date: 04/30/2017

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location (BRASS CAP): East: 1628044.5
North: 1769957.4

Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983[NAD 1983]).

2) Reason(s) for plugging well: MCOI-1 is old and not used for its intended purpose. The borehole represents a conduit to the subsurface for potential contaminants.

3) Was well used for any type of monitoring program? No If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: Dry
feet below land surface / feet above land surface (circle one)

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6) Depth of the well: 825.6 feet

7) Inside diameter of innermost casing: 1.1 inches.

8) Casing material: Stainless steel

9) The well was constructed with:

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

__X__ a well screen or perforated pipe, state the screened interval(s): 815-825.5 ft bgl

10) What annular interval surrounding the artesian casing of this well is cement-grouted? None

11) Was the well built with surface casing? No If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? No If yes, please describe: _____

_____

12) Has all pumping equipment and associated piping been removed from the well? Yes 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: The piezometer is cemented in place from surface to 77 ft bgl. Therefore, the piezometer will not be overdrilled. The piezometer will be pressure grouted with neat cement from total depth to 2 ft bgl via tremie pipe. The casing will be cut near ground surface and the top 2 ft will be filled with concrete and mounded above the existing grade.

2) Will well head be cut-off below land surface after plugging? Well head will be cut near ground surface.

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: Approximately 39.3 gallons

4) Type of Cement proposed: Portland Type I/II cement

5) Proposed cement grout mix: 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

7) Grout additives requested, and percent by dry weight relative to cement: None

8) Additional notes and calculations: None

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

Corehole MCOI-1 was drilled to 843.2 ft bgl in 2005. MCOI-1 piezometer was installed in the corehole and is constructed with 825.6 ft of 1-in. diameter stainless steel casing with a screened interval from 815 to 825.5 ft bgl. All surface appurtenances will be removed from around the piezometer before it is abandoned.

VIII. SIGNATURE:

I, Mark Everett, say that I have carefully read the foregoing Well Plugging 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.

Mark Everett — Signature of Applicant

5-20-15 — Date

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.

____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 6TH day of July, 2015

TOM BLAINE P.E.

~~Scott A. Verhines~~, State Engineer

By: [signature]

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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)			Surface
Bottom of proposed interval of grout placement (ft bgl)			825.6
Theoretical volume of grout required per interval (gallons)			39.3 40.8 ok
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			6
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

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TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). 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 sealant placement (ft bgl)			
Bottom of proposed sealant of grout placement (ft bgl)			
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95351 TA-52 Hole NW-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/21/15 Date well plugging concluded: 7/21/15

5) GPS Well Location: East: 1629046.611
North: 1768198.532
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: well 1, 77.2, well 2, 3 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No . If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well TA-52 Test Hole NW-1 was constructed with 2-in ID plastic tubing and 0.75-in ID tubing to 97 ft bgl. However, when depths were measured inside the tubes, the 2-in ID tube was total depth was 77.2 ft bgl and the 0.75-in ID tube was blocked at 3.5 ft bgl. Also, due to construction details, this well abandonment was not supposed to include over-drilling. However, the surface casing extended only to ~2 ft bgl and was easily removed. The 2-in tube was cemented with 1-in poly tubing from 77.2 to 2 ft bgl with Portland Type I/II neat cement. The plastic tubes were drilled out from surface to 20 ft bgl with a 6.25-in ID/10-in OD hollow stem auger, terminating the tubing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	13.4 gallons	9.6 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	2.8 gallons	1.7 gallons	Tremie	Cement in 2-in. plastic tubing from 2 to 77.3 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sachs, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller — Date: 12-15-15

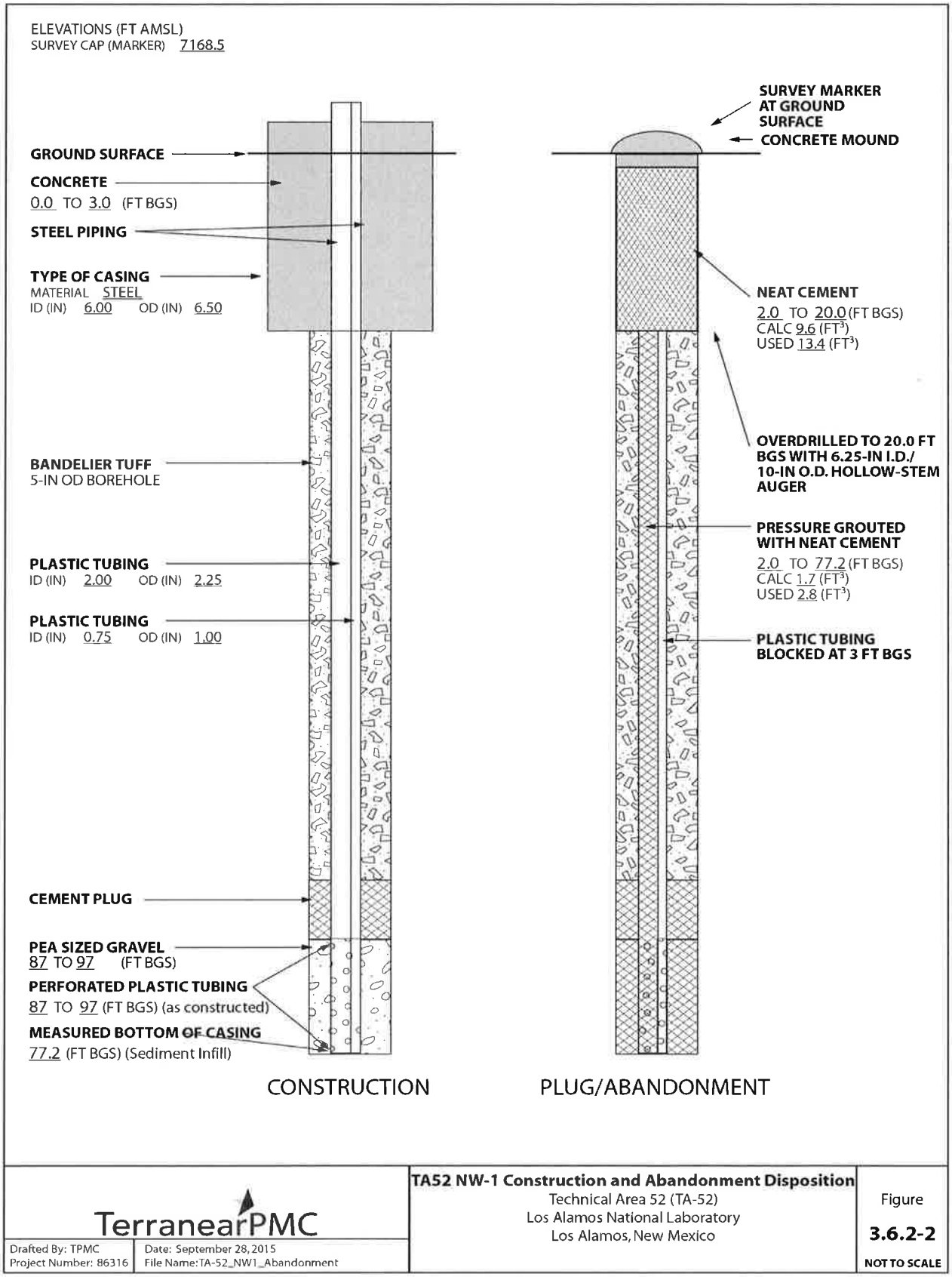


Figure 3.6.2-2 TA-52 Well NW-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95352 TA-52 Hole SE-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/22/15 Date well plugging concluded: 7/22/15

5) GPS Well Location: East: 1629041.992
North: 1768200.691
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: well 1, 77.8, well 2, 4.5 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No . If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well TA-52 Test Hole SE-1 was constructed with 2-in ID plastic tubing and 0.75-in ID tubing to 97 ft bgl. However, when depths were measured inside the tubes, the 2-in ID tube was total depth was 77.8 ft bgl and the 0.75-in ID tube was blocked at 4.5 ft bgl. Also, due to construction details, this well abandonment was not to include over-drilling. However, the surface casing extended only to ~2 ft bgl and was easily removed. The 2-in tube was cemented with 1-in poly tubing from 77.8 to 2 ft bgl with Portland Type I/II neat cement. The plastic tubes were drilled out from surface to 20 ft bgl with a 6.25-in ID/10-in OD hollow stem auger, terminating the tubing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	16 gallons	9.6 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	2.8 gallons	1.7 gallons	Tremie	Cement in 2-in. plastic tubing from 2 to 77.3 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brad L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Brad L. Sanders — 12-15-15

Signature of Well Driller — Date

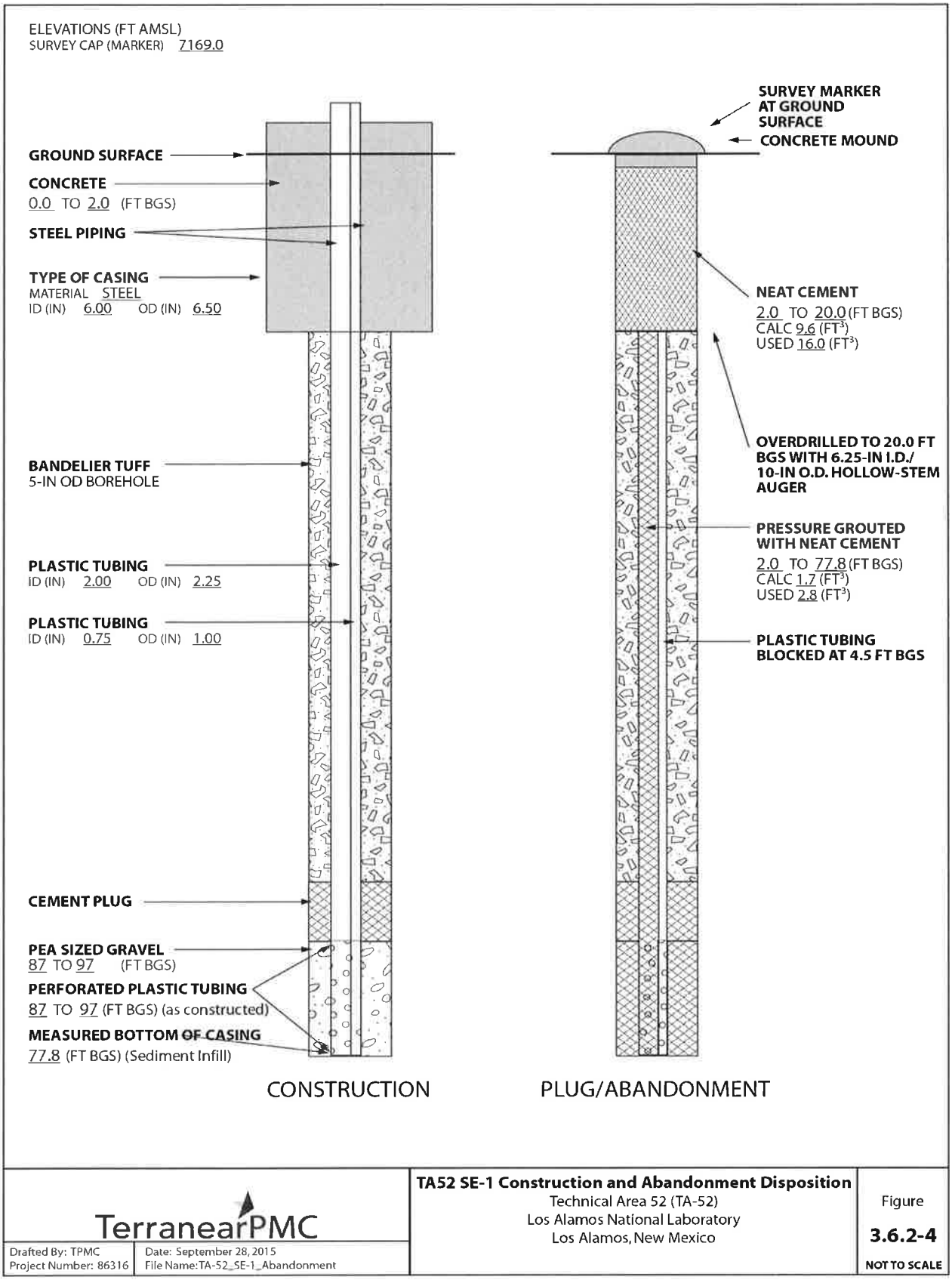


Figure 3.6.2-4 TA-52 Well SE-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95353 TA-52 Hole I

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/22/15 Date well plugging concluded: 7/22/15

5) GPS Well Location: East: 1629060.618
North: 1768242.618
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: well 1, 76.2, well 2, 5.5 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No . If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well TA-52 Test Hole I was constructed with 2-in ID plastic tubing and 0.75-in ID tubing to 97 ft bgl. However, when depths were measured inside the tubes, the 2-in ID tube was total depth was 76.2 ft bgl and the 0.75-in ID tube was blocked at 5.5 ft bgl. Also, due to construction details, this well abandonment was not to include over-drilling. However, the surface casing extended only to ~2 ft bgl and was easily removed. The 2-in tube was cemented with 1-in poly tubing from 76.2 to 2 ft bgl with Portland Type I/II neat cement. The plastic tubes were over-drilled from surface to 20 ft bgl with a 6.25-in ID/10-in OD hollow stem auger, terminating the tubing at 20 ft bgs, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	16 gallons	9.6 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
20					
78	Portland Type I/II Cement	2.8 gallons	1.7 gallons	Tremie	Cement in 2-in. plastic tubing from 2 to 77.3 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Braden L. Sachs, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-8-15
Date

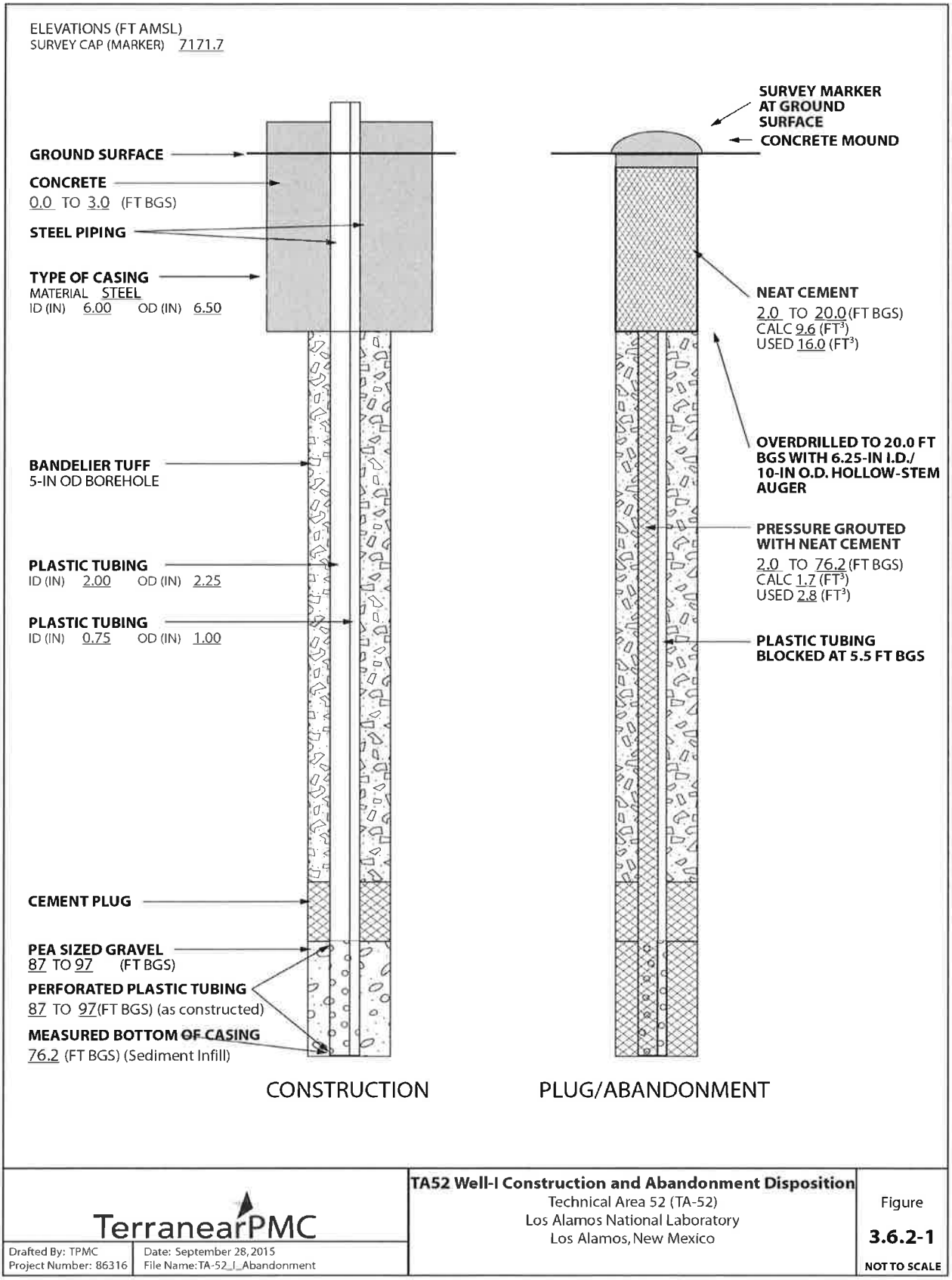


Figure 3.6.2-1 TA-52 Well-I Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95354 TA-52 NE-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/22/15 Date well plugging concluded: 7/22/15

5) GPS Well Location: East: 1629056.249
North: 1768205.599
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: well 1, 284.2, wells 2 and 3, 4 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No . If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well TA-52 Test Hole NE-1 was constructed with 1 string of 1.5-in ID plastic tubing to 291 ft bgl and 2 strings of 0.75-in ID tubing to 170 ft bgl. However, when depths were measured inside the tubes, the 1.5-in ID tube total depth was 284.2 ft bgl and the 2 0.75-in ID tubes were blocked at 4 ft bgl. Also, due to construction details, this well abandonment was not to include over-drilling. However, the surface casing extended only to ~2 ft bgl and was easily removed. The 1.5-in tube was cemented with 1-in poly tubing from 284.2 to 2 ft bgl with Portland Type I/II neat cement. The plastic tubes were drilled out from surface to 20 ft bgl with a 3.25-in ID/7-in OD hollow stem auger, terminating the tubing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	10.7 gallons	4.2 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	4 gallons	3.5 gallons	Tremie	Cement in 2-in. plastic tubing from 2 to 77.3 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sachs, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12/15/15

Date

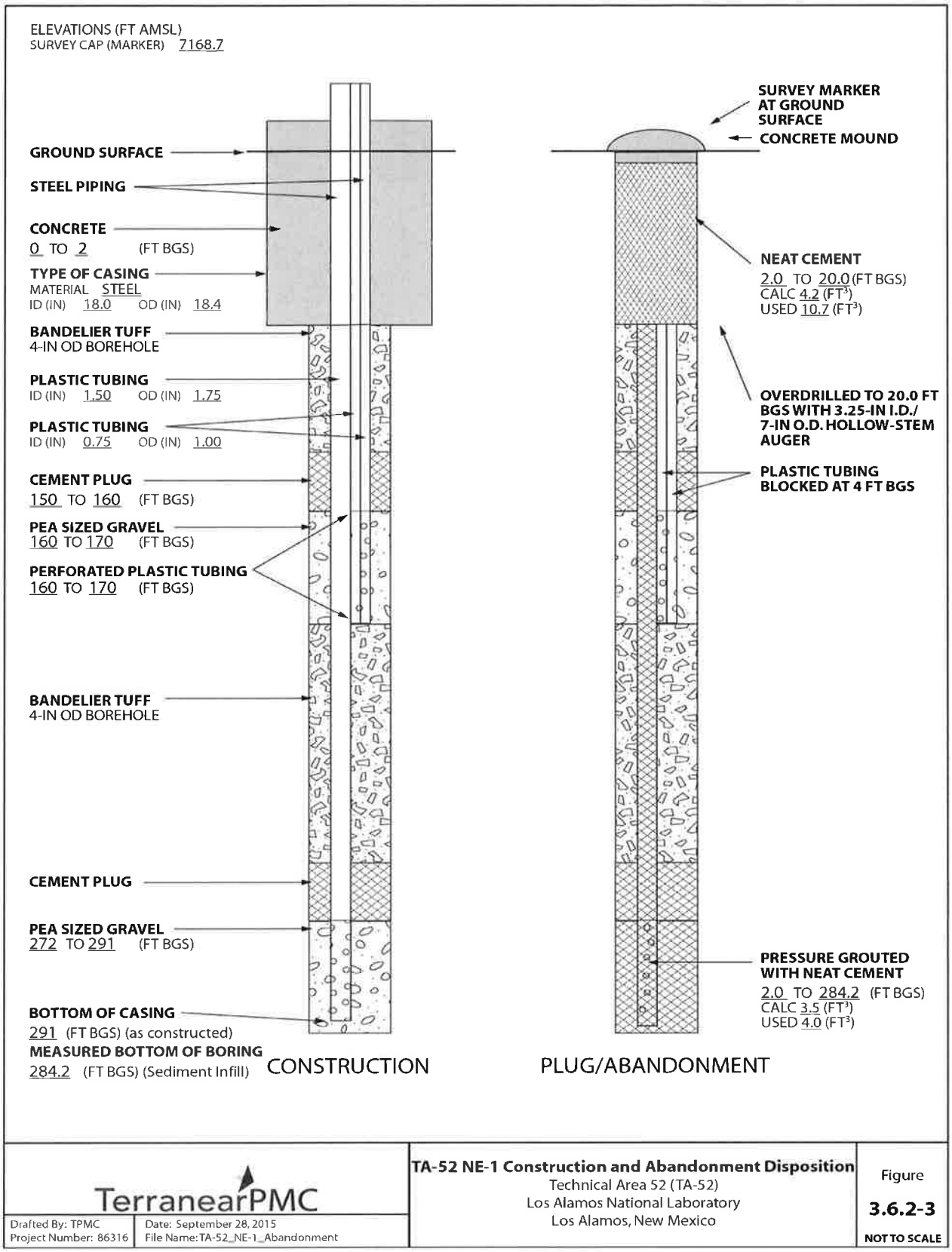


Figure 3.6.2-3 TA-52 Well NE-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95355 TA-52 Hole NE-2

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/22/15 Date well plugging concluded: 7/22/15

5) GPS Well Location: East: 1629054.546
North: 1768180.955
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: well 1, 77.3, well 2, 4.5 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No . If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well TA-52 Test Hole NE-2 was constructed with 2-in ID plastic tubing and 0.75-in ID tubing to 97 ft bgl. However, when depths were measured inside the tubes, the 2-in ID tube was total depth was 77.3 ft bgl and the 0.75-in ID tube was blocked at 4.5 ft bgl. Also, due to construction details, this well abandonment was to not include over-drilling. However, the surface casing extended only to ~2 ft bgl and was easily removed. The 2-in tube was cemented with 1-in poly tubing from 77.3 to 2 ft bgl with Portland Type I/II neat cement. The plastic tubes were drilled out from surface to 20 ft bgl with a 6.25-in ID/10-in OD hollow stem auger, terminating the tubing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	16 gallons	9.6 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	2.8 gallons	1.7 gallons	Tremie	Cement in 2-in. plastic tubing from 2 to 77.3 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brent L. Salas, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15

Date

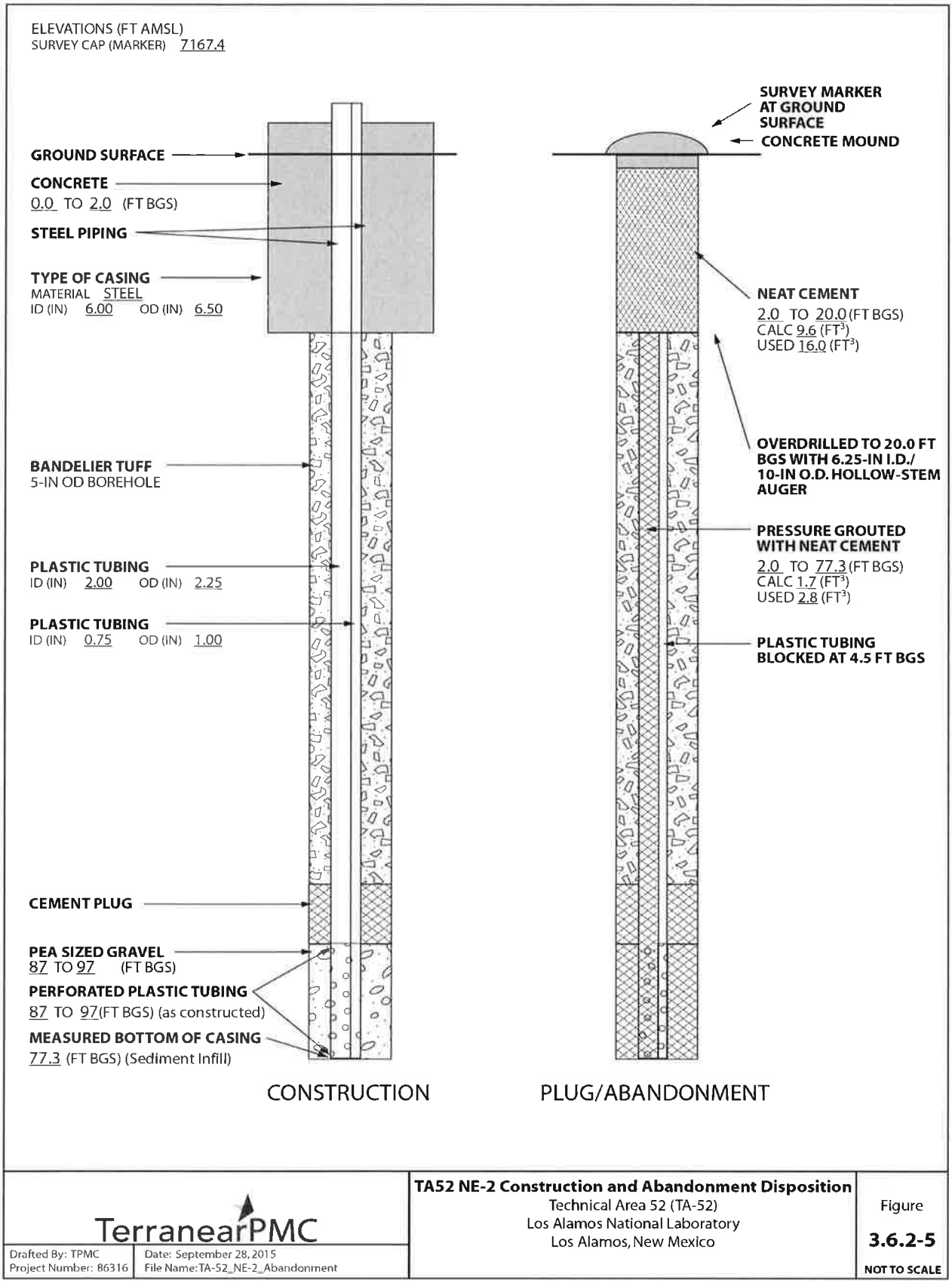


Figure 3.6.2-5 TA-52 Well NE-2 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95359 TSWB-6

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/21/15 Date well plugging concluded: 7/21/15

5) GPS Well Location: East: 1633382.200
North: 1768489.709
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 38.8 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? no If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The PVC casing supposed to be 2-in ID, however, the well was built with 3-in ID schedule 80 PVC. The well was silted in from 40 to 38.8 ft bgl. The PVC casing was cemented with 1-in poly tubing from 38.8 to 2 ft bgl with Portland Type I/II neat cement. The well casing was slated to be over-drilled with 4.25-in ID/7.5-in OD hollow-stem auger from surface to 20 ft bgl. However, the well was over-drilled with a 6.25-in ID/10-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	100.2 gallons	71.1 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
20					
	Portland Type I/II Cement	24.7 gallons	12 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 38.8 ft bgl.
38.8					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sabus, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

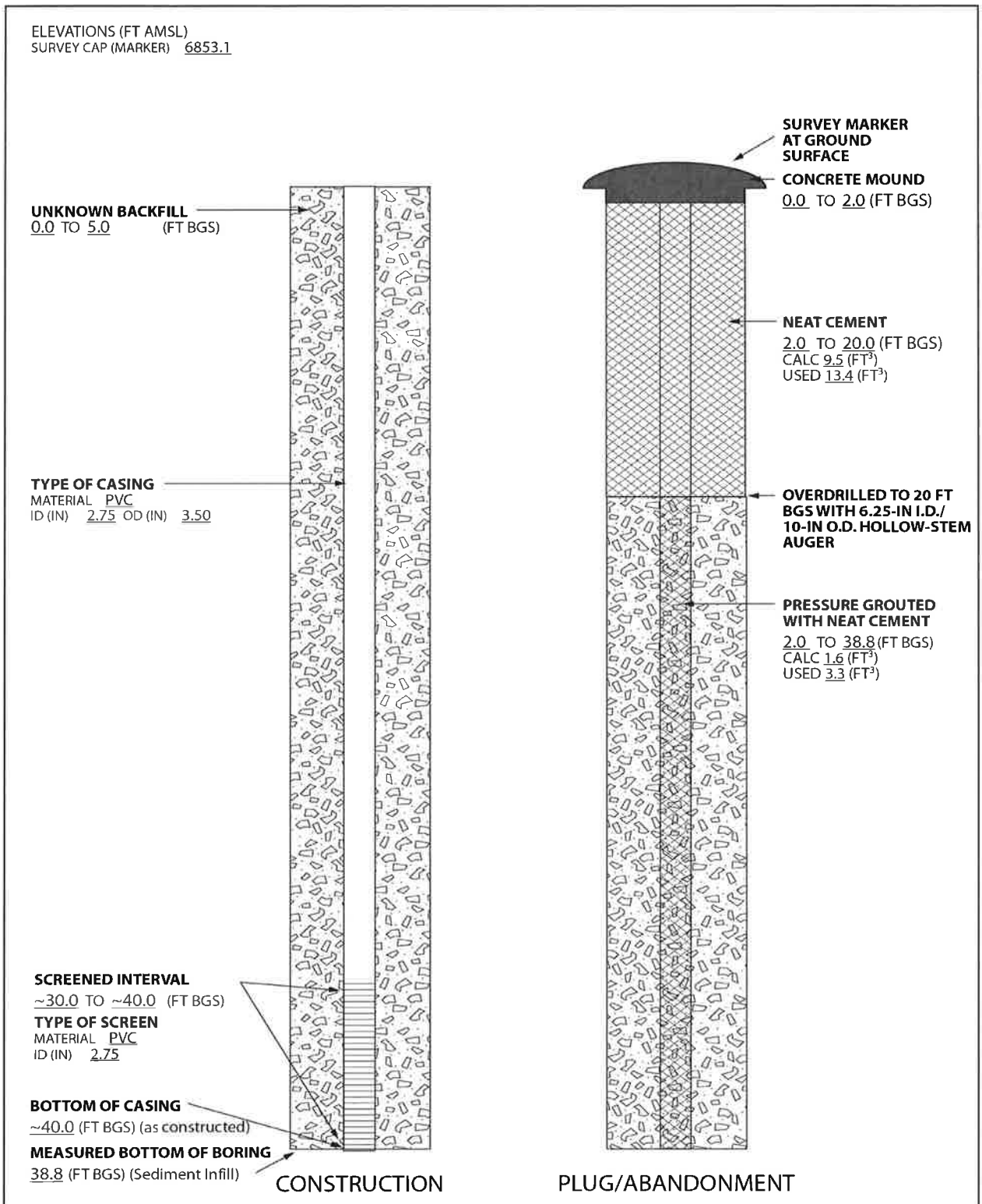


Figure 3.7.2-3 TSWB-6 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95360 BCO-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/28/15 Date well plugging concluded: 7/28/15

5) GPS Well Location: East: 1640649.415
North: 1778915.961
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 69.7 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? no If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well BCO-1 was reported to be constructed with 2-in PVC casing to 70 ft bgl, however, actual well construction was 4-in PVC casing, with a measured depth of 69.7 ft bgl. The 4-in ID PVC casing was grouted with 1-in poly tubing from total depth to 2 ft bgl with Portland Type I/II neat cement. The well casing was slated to be over-drilled out with 4.25-in ID/7.5-in OD hollow-stem auger from surface to 20 ft bgl. However, the casing was over-drilled with a 6.25-in ID/10-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	85.3 gallons	71.8 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	59.8 gallons	47.1 gallons	Tremie	Cement in 4-in. PVC well casing from 2 to 69.7 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Braden L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

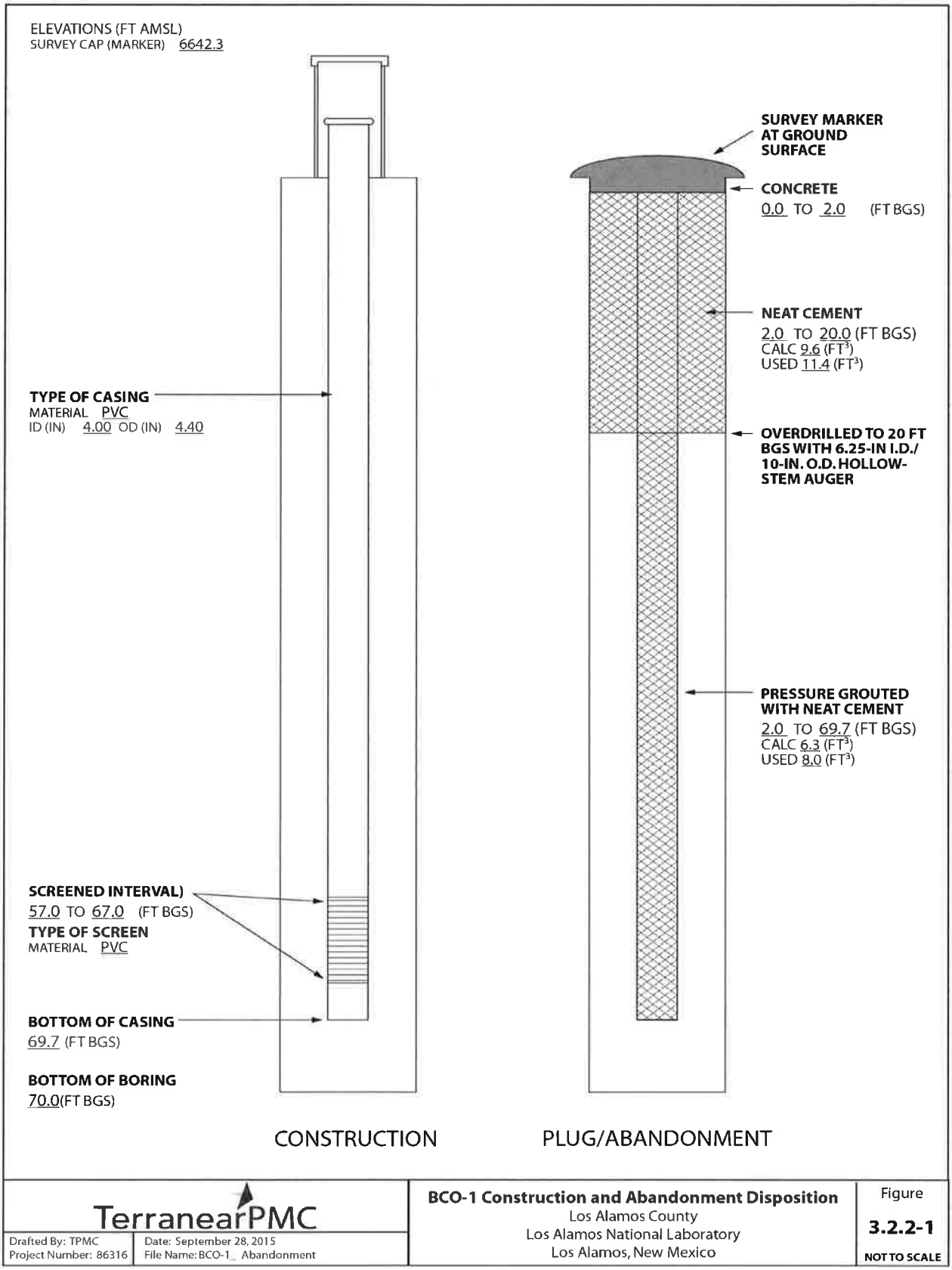


Figure 3.2.2-1 BCO-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95362 POTO-4A, B, C

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/04/15 Date well plugging concluded: 9/05/15

5) GPS Well Location: East: 1638939.305
North: 1757056.953
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: A: 47.2, B: 87.7, C: 174.2 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: A: dry, B: dry, C: 173.35 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? NO If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The individual 2-in. PVC casings were cemented with 1-in poly tubing from total depth (A: 47.2, B: 87.7, 174.2) to 2 ft bgl with Portland Type I/II neat cement. The nested piezometer was slated to be over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow-stem auger, though a 6.25-in ID/10-in OD hollow stem auger was used, terminating the casing stings at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	100.2 gallons	82.3 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
20					
50	Portland Type I/II Cement	9 gallons	8.2 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 47.2 ft bgl.
	Portland Type I/II Cement	17.2 gallons	15 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 87.7 ft bgl.
100					
	Portland Type I/II Cement	33.7 gallons	29.2 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 174.2 ft bgl.
200					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

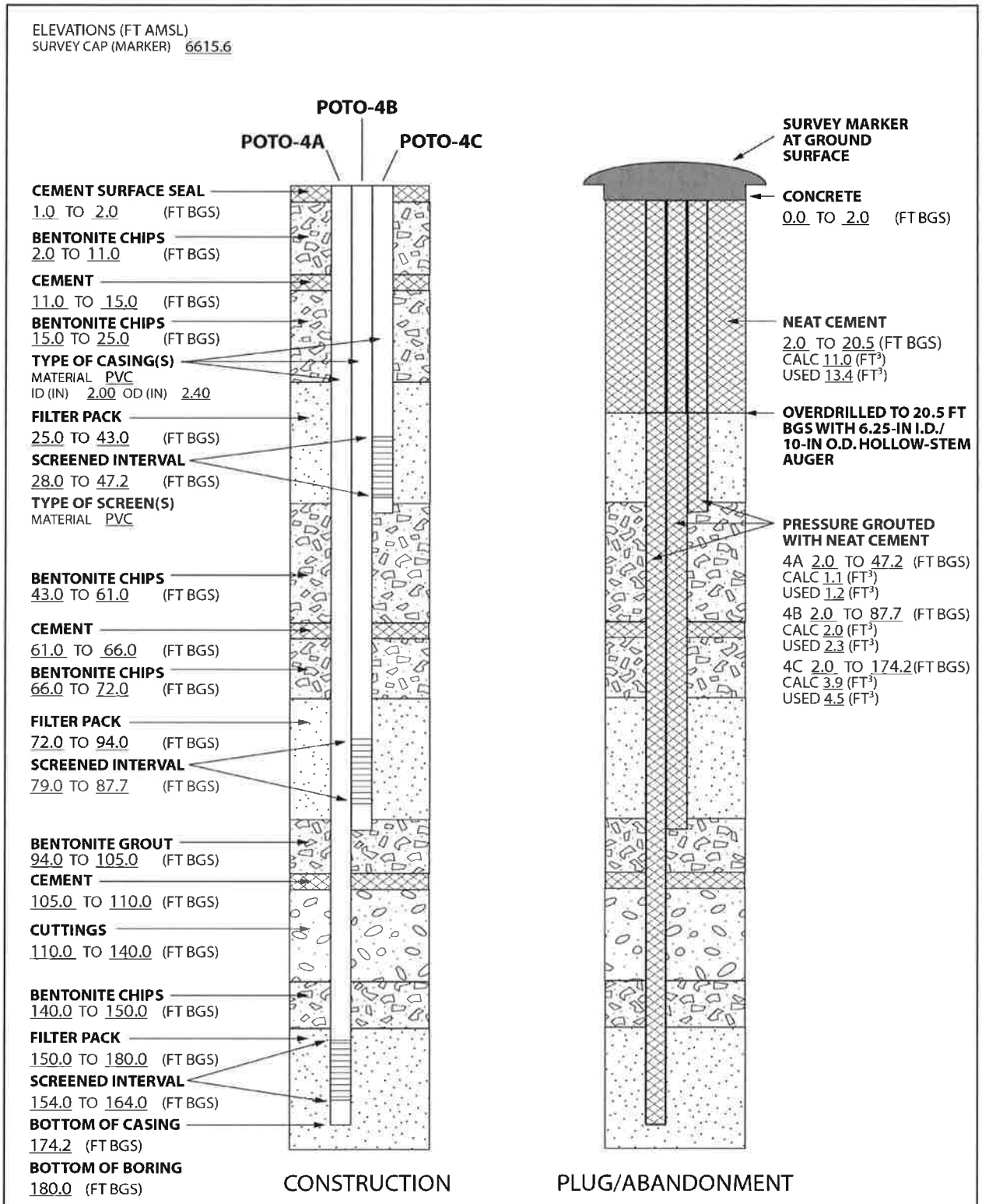


Figure 3.3.2-3 POTO-4A, B, C Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95363 POTO-5A, B

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/04/15 Date well plugging concluded: 9/05/15

5) GPS Well Location: East: 1638945.987
North: 1757050.902
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: A: 77.1, B: 27.2 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: A: 77.05, B: 26.6 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? NO If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The individual 2-in. PVC casings were cemented with 1-in poly tubing from total depth (A: 77.1, B: 27.2) to 2 ft bgl with Portland Type I/II neat cement. The nested piezometer was slated to be over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow-stem auger, however, a 6.25-in ID/10-in OD hollow stem auger was used, terminating the casing stings at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	55.4 gallons	53.9 gallons	Tremie/Augers	Surface plug in 8-in. borehole from surface to 20 ft bgl
20					
50	Portland Type I/II Cement	5.2 gallons	4.5 gallons	Tremie	B: Cement in 2-in. PVC well casing from 2 to 27.2 ft bgl.
	Portland Type I/II Cement	15 gallons	12.7 gallons	Tremie	A: Cement in 2-in. PVC well casing from 2 to 77.1 ft bgl.
100					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L Sellers, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-8-15

Date

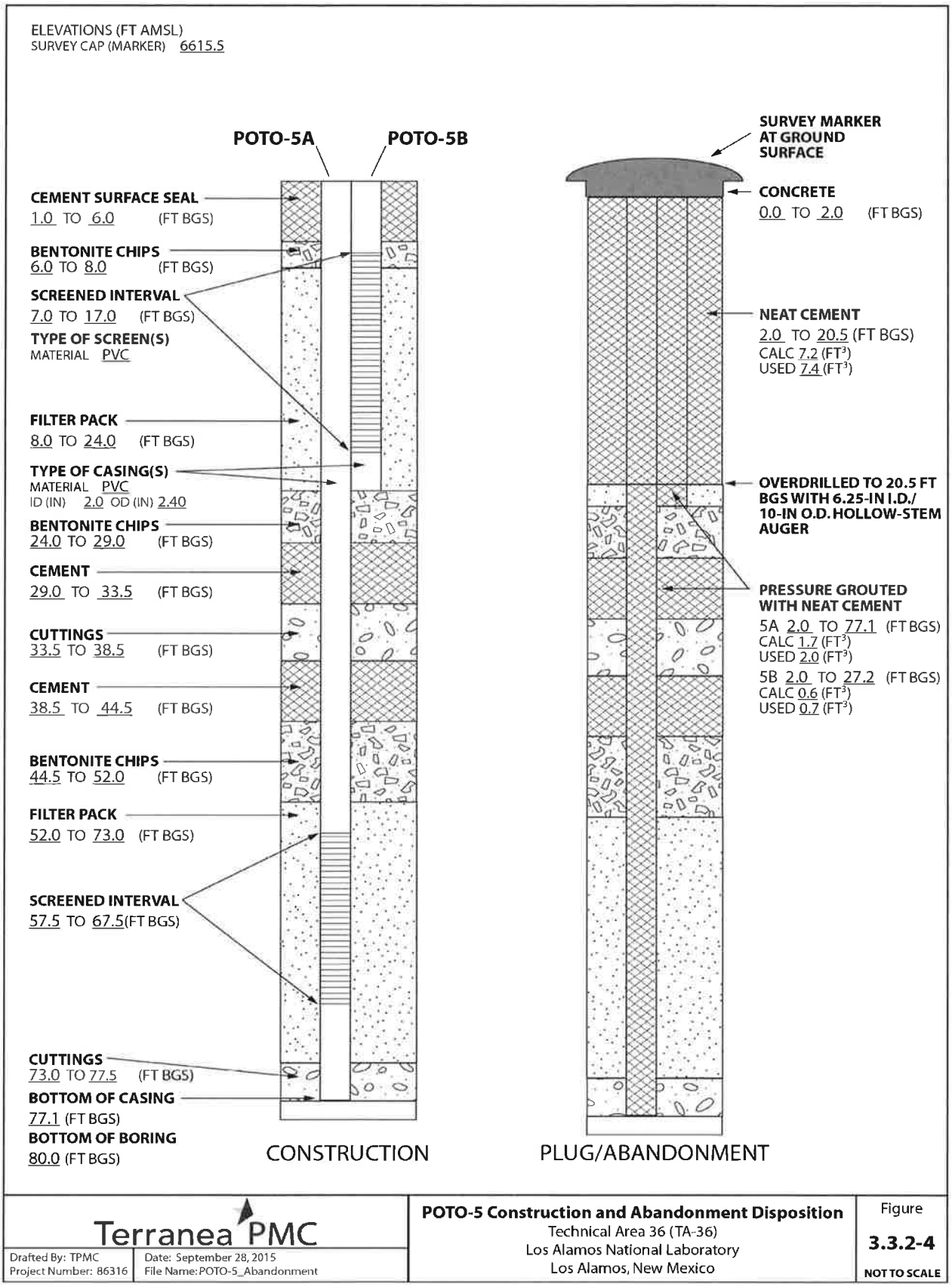


Figure 3.3.2-4 POTO-5A, B Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95364 R-4 East, West

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/02/15 Date well plugging concluded: 9/02/15

5) GPS Well Location: East: 1639297.733
North: 1776517.093
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: East: 230.9, West: 125.0 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: East: dry, West: dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? No If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The individual 2-in. PVC casings were cemented with 1-in poly tubing from total depth (East: 230.9, West: 125.0) to 2 ft bgl with Portland Type I/II neat cement. The nested piezometer was to be over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow-stem auger, however, 6.25-in ID/10-in OD hollow-stem auger was used, terminating the casing strings at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0 20	Portland Type I/II Cement	90 gallons	82.3 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
150	Portland Type I/II Cement	24.7 gallons	20.2 gallons	Tremie	West: Cement in 2-in. PVC well casing from 2 to 125.0 ft bgl.
300	Portland Type I/II Cement	44.1 gallons	37.4 gallons	Tremie	East: Cement in 2-in. PVC well casing from 2 to 230.9 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Braden L Sorbus, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

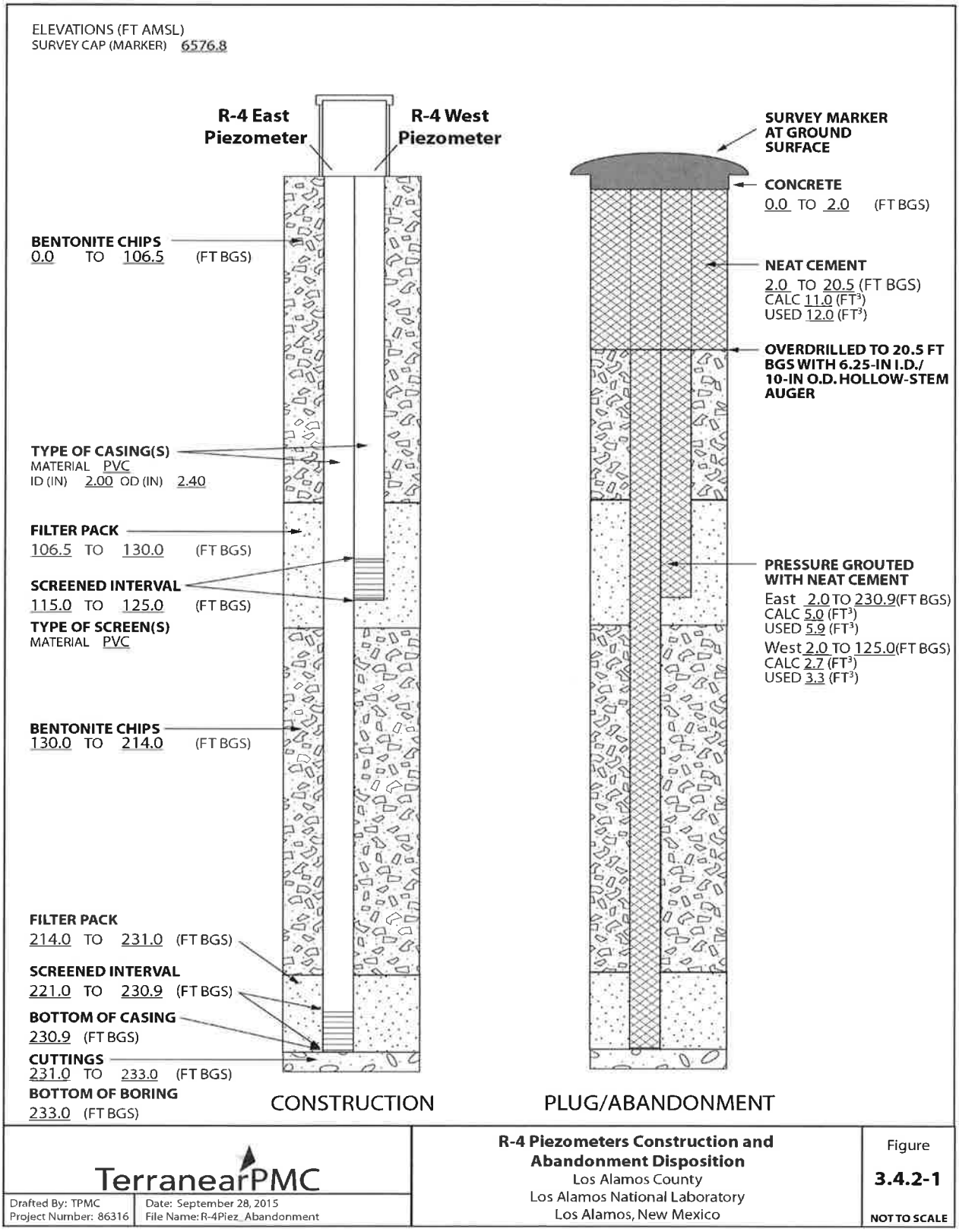


Figure 3.4.2-1 R-4 East and West Piezometers Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95365 MCOI-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/3/15 Date well plugging concluded: 9/3/15

5) GPS Well Location: East: 1628046.120
North: 1769956.568
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 825.6 ft below ground level (bgl),
by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/6/2015

9) Were all plugging activities consistent with an approved plugging plan? yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well MCOI-1 was grouted with 0.5-in poly tubing from total depth to 2 ft bgl with Portland Type I/II cement. The well casing was over-drilled with 4.25-in ID/7.5-in OD hollow-stem auger from surface to 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	55.4 gallons	44.9 gallons	Tremie/Augers	Surface plug in 8-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	35.2 gallons	33.7 gallons	Tremie	Cement in 1.1-in. steel well casing from 2 to 825.6 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brain L Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15

Date

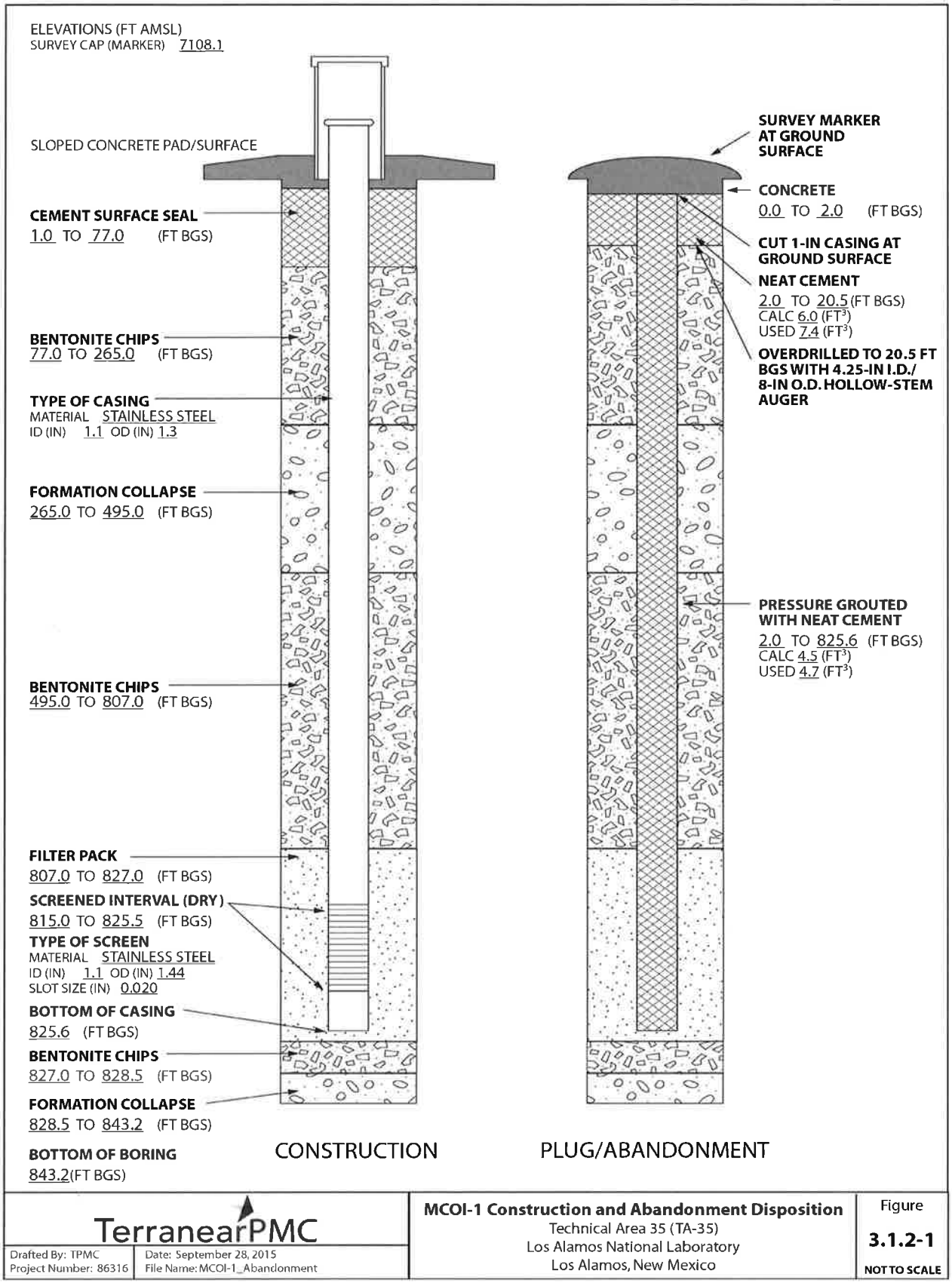


Figure 3.1.2-1 MCOI-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95371 POTM-2

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/04/15 Date well plugging concluded: 9/05/15

5) GPS Well Location: East: 1638907.630
North: 1757119.565
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 53.1 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The 2-in. aluminum casing was silted in from 54 to 53.1 ft bgl. The aluminum casing was cemented with 1-in poly tubing from 53.1 to 2 ft bgl with Portland Type I/II neat cement. The well casing was over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	55.4 gallons	53.9 gallons	Tremie/Augers	Surface plug in 8-in. borehole from surface to 20 ft bgl
20					
53.1	Portland Type I/II Cement	12 gallons	9 gallons	Tremie	Cement in 2-in. aluminum well casing from 2 to 53.1 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-5-15

Date

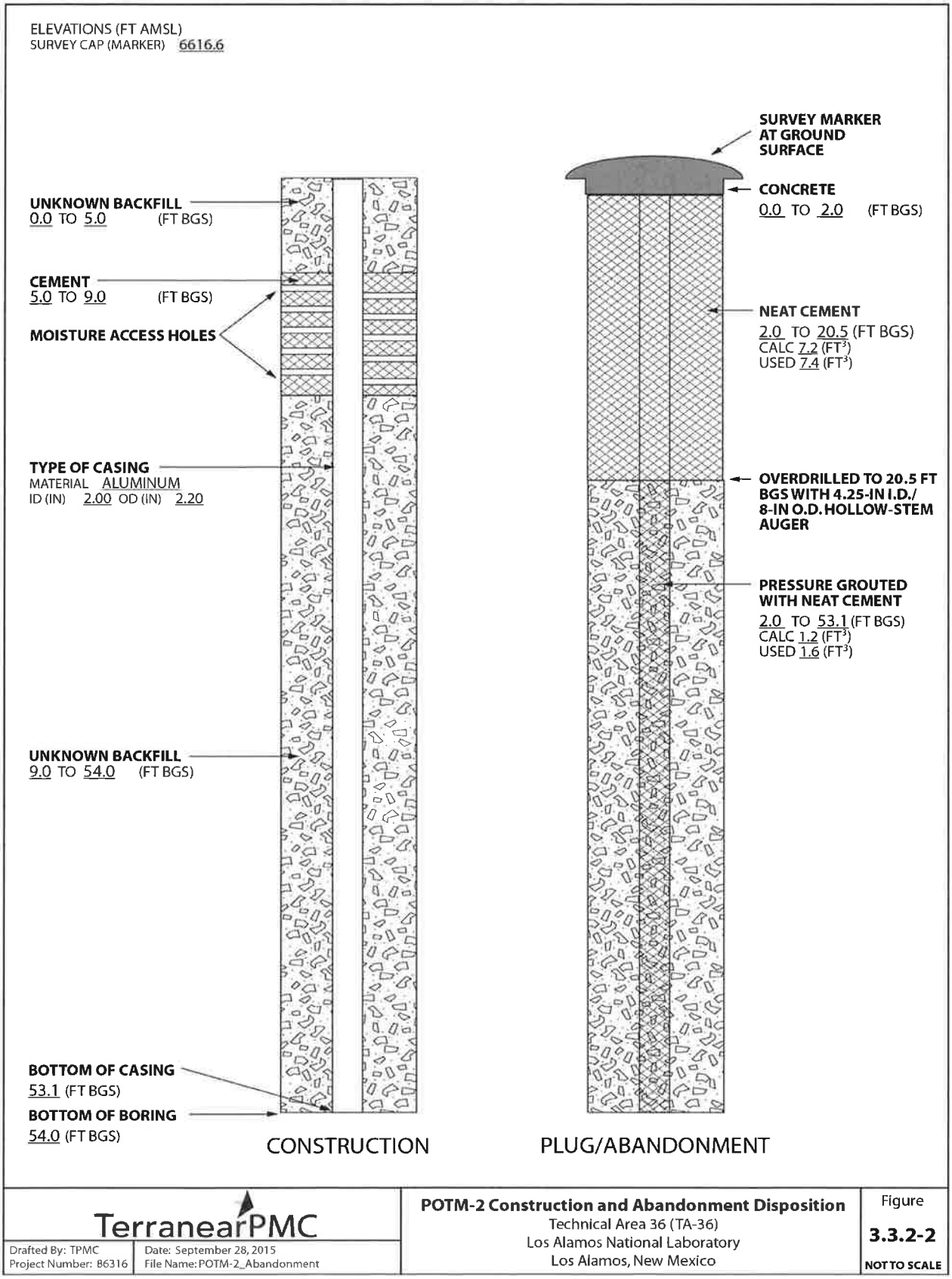


Figure 3.3.2-2 POTM-2 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95372 POTM-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/04/15 Date well plugging concluded: 9/05/15

5) GPS Well Location: East: 1637636.415
North: 1757302.965
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 46.5 ft below ground level (bgl),
by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? Yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The 2-in. aluminum casing was silted in from 47 to 46.5 ft bgl. The aluminum casing was cemented with 1-in poly tubing from 46.5 to 2 ft bgl with Portland Type I/II neat cement. The well casing was over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	70 gallons	54 gallons	Tremie/Augers	Surface plug in 8-in. borehole from surface to 20 ft bgl
20					
46.5	Portland Type I/II Cement	12.7 gallons	8.2 gallons	Tremie	Cement in 2-in. aluminum casing from 2 to 46.5 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15

Date

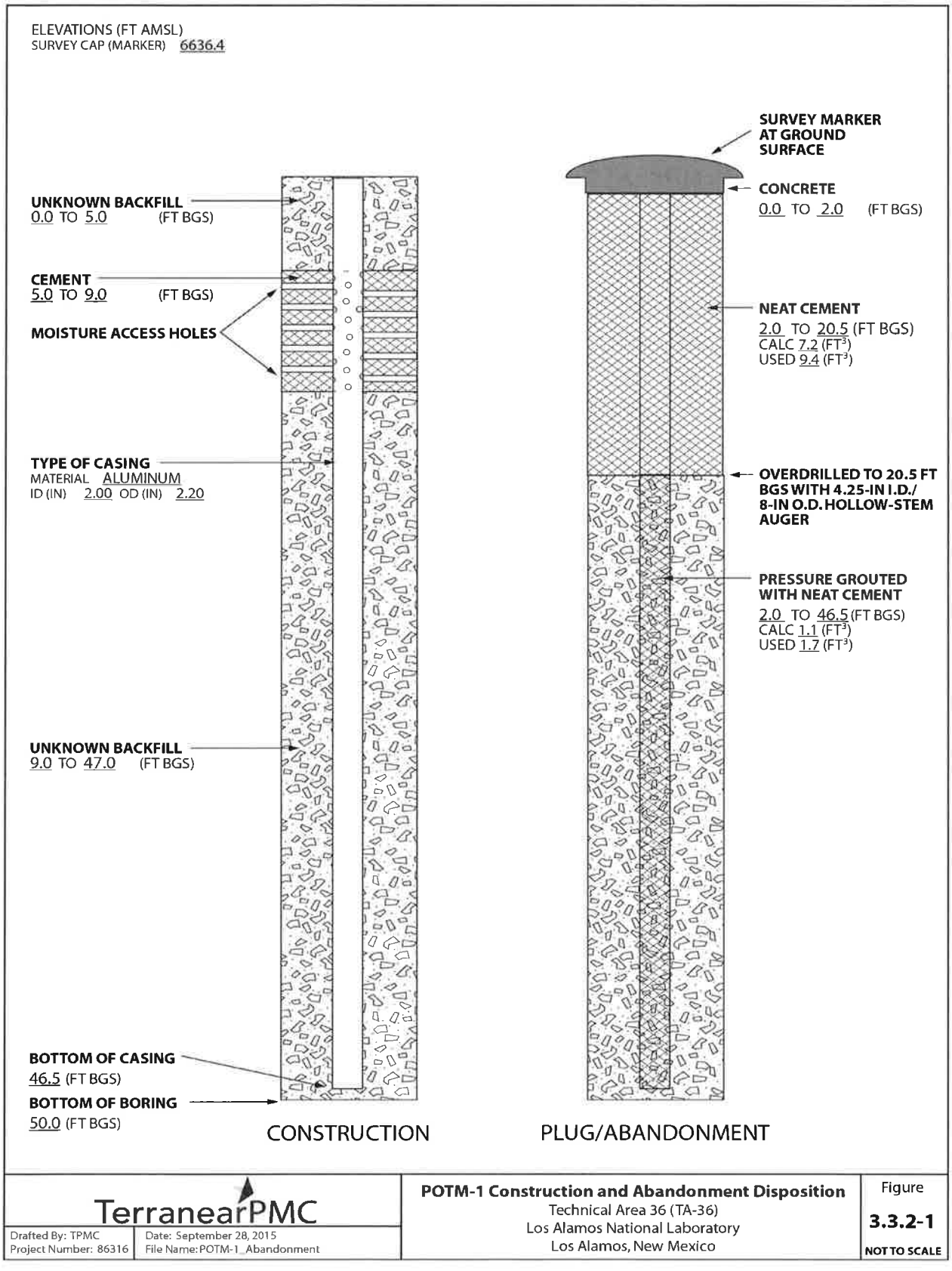


Figure 3.3.2-1 POTM-1 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95374 MCWB-6.2A

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/20/15 Date well plugging concluded: 7/21/15

5) GPS Well Location: East: 1633752.812
North: 1768967.860
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 45.6 ft below ground level (bgl),
by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? No If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The well was supposed to be 2-in schedule 40 PVC casing, however the well casing turned out to be 3-in schedule 80 PVC. The PVC casing was cemented with 1-in poly tubing from 45.6 to 2 ft bgl with Portland Type I/II neat cement. The well casing was over-drilled from surface to 20 ft bgl with a 6.25-in ID/10-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	100 gallons	72 gallons	Tremie/Augers	Surface plug in 10-in. borehole from surface to 20 ft bgl
20					
45.6	Portland Type I/II Cement	21.7 gallons	13.5 gallons	Tremie	Cement in 3-in. schedule 80 PVC casing from 2 to 45.6 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brad L. Sachs, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

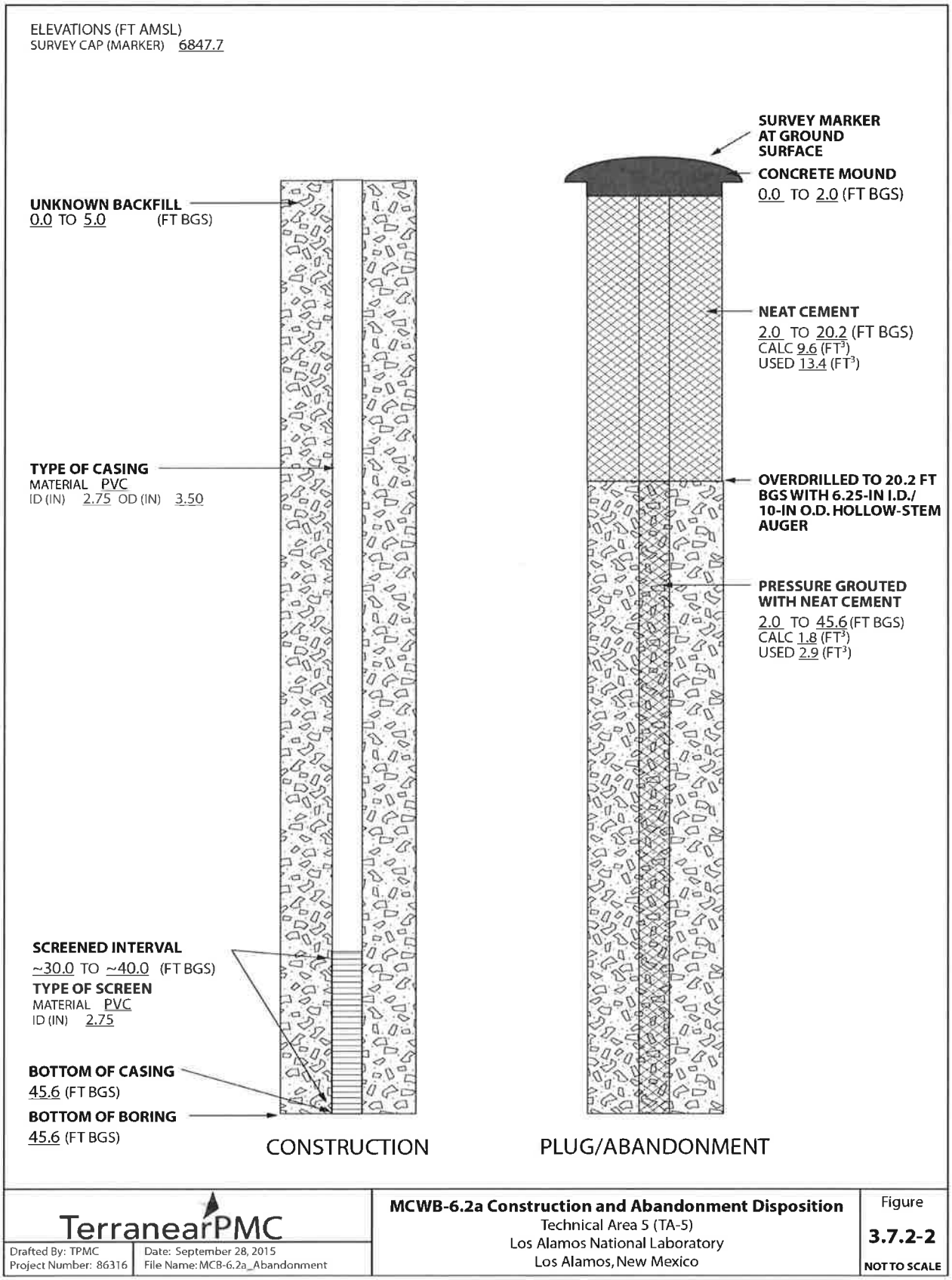


Figure 3.7.2-2 MCWB-6.2a Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95376 MCWB-5

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/20/15 Date well plugging concluded: 7/20/15

5) GPS Well Location: East: 1632576.529
North: 1769484.011
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 27.7 ft below ground level (bgl),
by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? no If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The 2-in PVC casing was silted in from 40 to 27.7 ft bgl. The PVC casing was cemented with 1-in poly tubing from 27.2 to 2 ft bgl with Portland Type I/II neat cement. The well casing was slated to be over-drilled with 4.25-in ID/7.5-in OD hollow-stem auger from surface to 20 ft bgl. However, the well was over-drilled with a 3.25-in ID/7-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0 20	Portland Type I/II Cement	50.1 gallons	38.9 gallons	Tremie/Augers	Surface plug in 7-in. borehole from surface to 20 ft bgl
27.7	Portland Type I/II Cement	15 gallons	8.2 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 27.7 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brandon L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15
Date

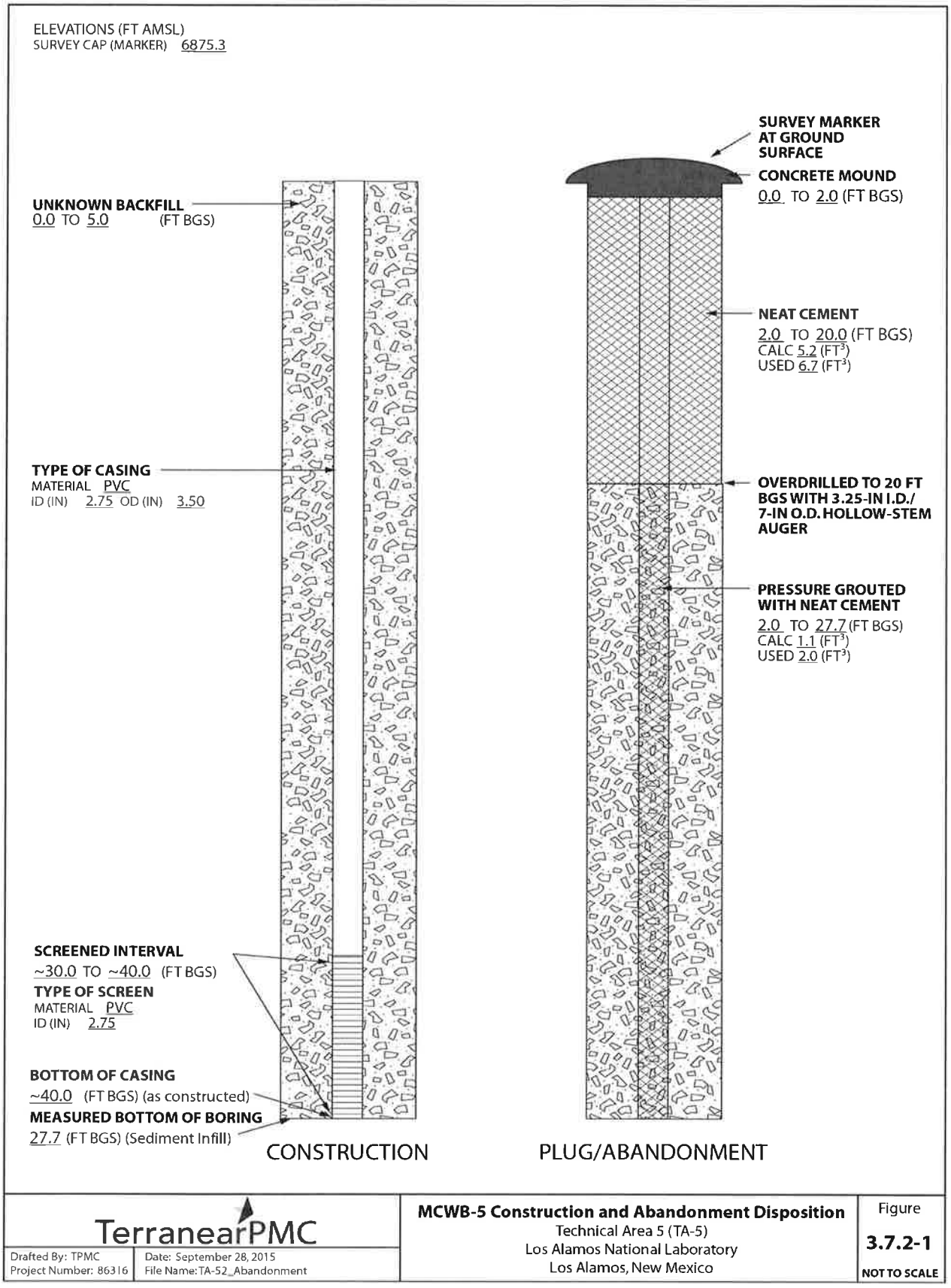


Figure 3.7.2-1 MCWB-5 Well Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95377 16-P-12A

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 9/4/15 Date well plugging concluded: 9/4/15

5) GPS Well Location: East: 1616900.389
North: 1764076.658
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 175.4 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: 170.1 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? yes If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The 2-in aluminum casing was cemented with 1-in poly tubing from 175.4 to 2 ft bgl with Portland Type I/II neat cement. The well casing was over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0 20	Portland Type I/II Cement	55.4 gallons	44.9 gallons	Tremie/Augers	Surface plug in 8-in. borehole from surface to 20 ft bgl
200	Portland Type I/II Cement	35.2 gallons	29.2 gallons	Tremie	Cement in 2-in. aluminum well casing from 2 to 175.4 ft bgl.

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brad L Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15

Date

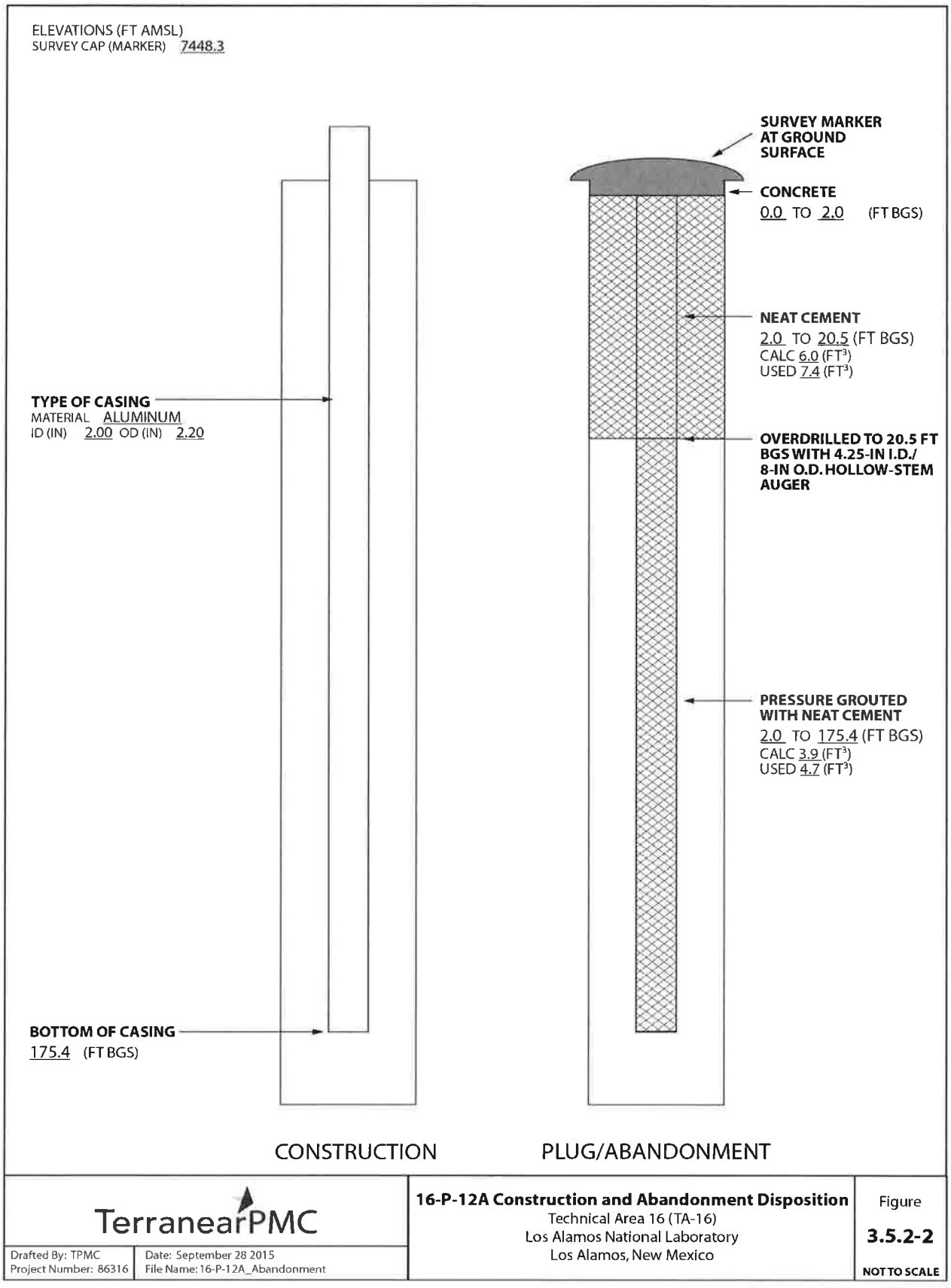


Figure 3.5.2-2 Borehole 16-P-12A Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95378 16-P-0

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/23/15 Date well plugging concluded: 7/23/15

5) GPS Well Location: East: 1616459.399
North: 1763584.287
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 119.0 ft below ground level (bgl),
by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: 118.6 ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? no If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

The 2-in aluminum casing was cemented with 1-in poly tubing from 119.0 to 2 ft bgl with Portland Type I/II neat cement. The well casing was scheduled to be over-drilled from surface to 20 ft bgl with a 4.25-in ID/8-in OD hollow stem auger, however 3.25-in ID/7-in OD augers were used, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0 20	Portland Type I/II Cement	39.6 gallons	35.9 gallons	Tremie/Augers	Surface plug in 7-in. borehole from surface to 20 ft bgl
120	Portland Type I/II Cement	29.9 gallons	20.2 gallons	Tremie	Cement in 2-in. aluminum well casing from 2 to 119.0 ft bgl.
57					

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Braden L. Sachs, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Signature of Well Driller

12-15-15

Date

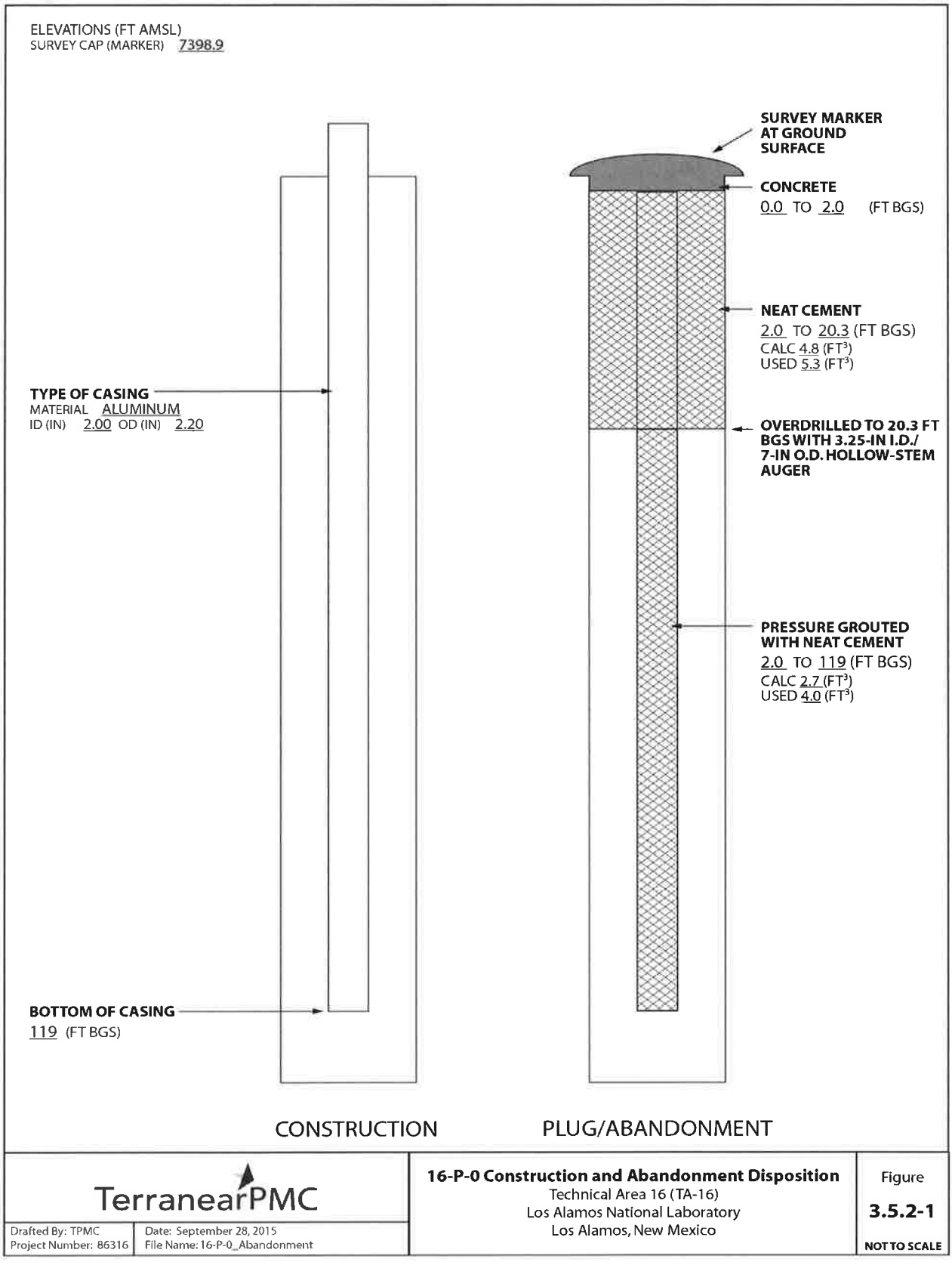


Figure 3.5.2-1 Borehole 16-P-0 Construction and Abandonment Disposition

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP:

State Engineer Well Number: RG95379 BCM-1

Well owner: U.S. Department of Energy/Los Alamos National Laboratory Phone No.: 505-667-3005

Mailing address: P.O. Box 1663

City: Los Alamos State: New Mexico Zip code: 87545

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: Geomechanics Southwest, Inc. (GSI)

2) New Mexico Well Driller License No.: 1522 Expiration Date: 4/30/17

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): GSI

4) Date well plugging began: 7/28/15 Date well plugging concluded: 7/28/15

5) GPS Well Location: East: 1640658.884
North: 1778914.149
Well coordinates are New Mexico State Plane Grid Coordinates, Central Zone (North American Datum, 1983 [NAD 1983]).

6) Depth of well confirmed at initiation of plugging as: 67.8 ft below ground level (bgl), by the following manner: Manual tag line measurement

7) Static water level measured at initiation of plugging: Dry ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 7/1/2015

9) Were all plugging activities consistent with an approved plugging plan? no If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

Well BCM-1 had a reported depth of 47.8 ft bgl, however, the actual well depth was measured at 67.8 ft bgl. The 2-in PVC casing was grouted with 1-in poly tubing from total depth to 2 ft bgl with Portland Type I/II neat cement. The well casing was slated to be over-drilled with 4.25-in ID/7.5-in OD hollow-stem auger from surface to 20 ft bgl. However, the well was over-drilled with a 3.25-in ID/7-in OD hollow stem auger, terminating the casing at 20 ft bgl, with neat cement emplaced from 20 ft bgl to ground level.

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
0	Portland Type I/II Cement	39.6 gallons	30.7 gallons	Tremie/Augers	Surface plug in 7-in. borehole from surface to 20 ft bgl
10					
	Portland Type I/II Cement	15 gallons	11.2 gallons	Tremie	Cement in 2-in. PVC well casing from 2 to 67.8 ft bgl.
57					

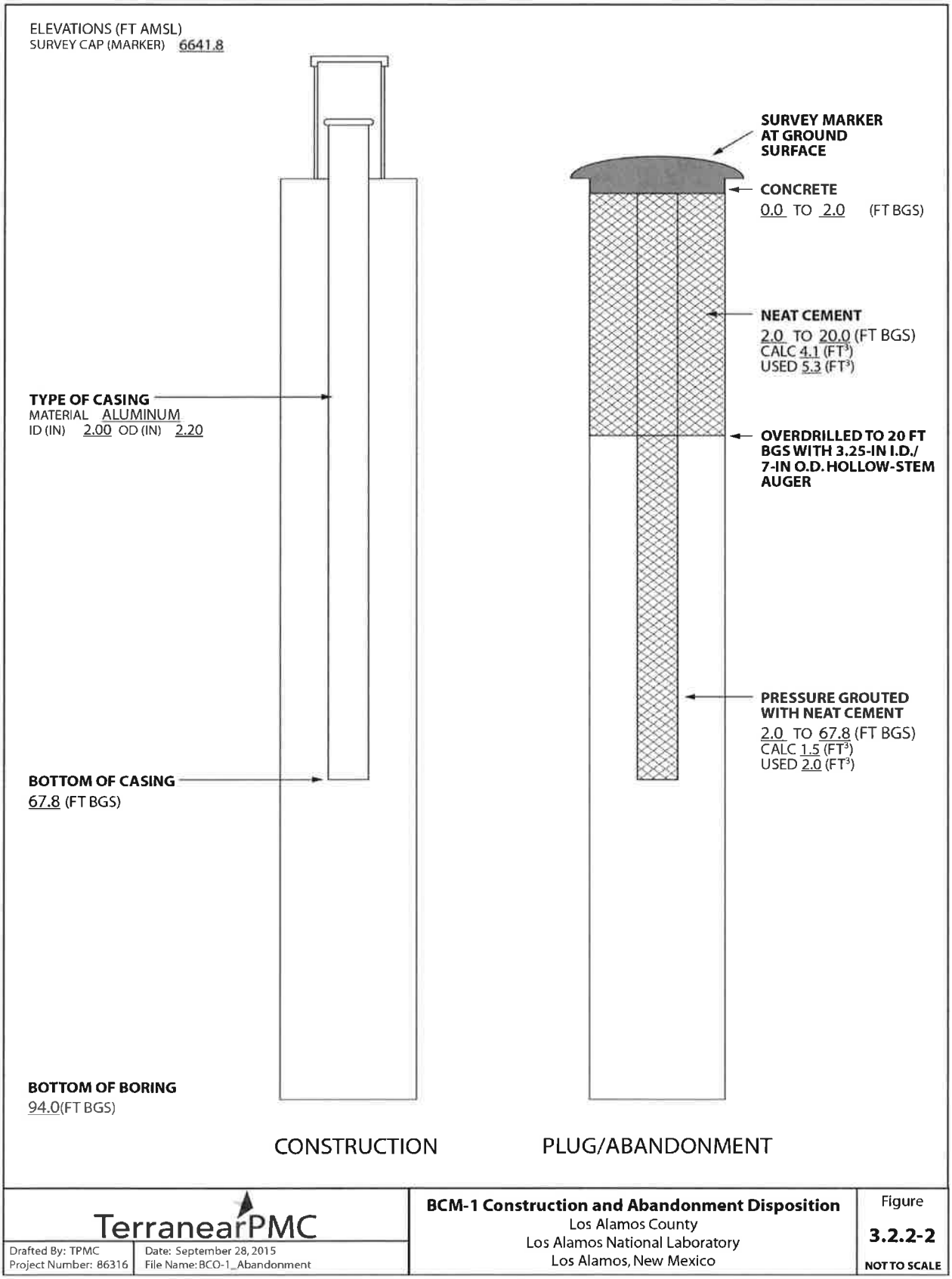
MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Brad L. Sanders, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Brad L Sanders — 12-5-15

Signature of Well Driller — Date



TerranearPMC	BCM-1 Construction and Abandonment Disposition Los Alamos County Los Alamos National Laboratory Los Alamos, New Mexico	Figure 3.2.2-2 NOT TO SCALE
Drafted By: TPMC Project Number: 86316	Date: September 28, 2015 File Name: BCO-1_Abandonment	

Figure 3.2.2-2 BCM-1 Construction and Abandonment Disposition