Appendix D

Well Plugging Plans of Operations

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
SANTA FE

Tom Blaine, P.E.
State Engineer

CONCHA ORTIZ Y PINO BLDG.
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130 SOUTH CAPITOL
SANTA FE, NEW MEXICO 87504-5102
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December 12, 2016

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

Re: Plugging Plans of Operation, LANL Wells RG-96461 PODs 1-10

Greetings:

After a review of the Well Plugging Plan of Operations submitted on September 27, 2016, The Office of the Engineer is returning a favorable approval with specific Plugging Conditions and has accepted the Plugging Plan submitted for filing.

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,

Ramona Martinez
Northern Rio Grande Basin Manager
Water Rights Division

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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-96461 PODs 1-10

The U.S. Department of Energy / Los Alamos National Laboratory has identified 10 Monitoring Wells as tabulated below. On the Well Plugging Plan of Operations received September 27, 2016, the applicant stated that the wells are no longer needed as the study is completed. The applicant has requested that the wells be plugged and abandoned by hand without the use of a drill rig. The applicant states that the protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled it will be cut off below ground surface and cemented in place. There are no OSE records available for these wells. The wells were used to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water. Existing active wells that are in close proximity to the wells 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	Water Static Level	Inside diameter (inches)	Total depth (feet)	Latitude North	Longitude West
RG-96461 POD 1 (CdV-16-611935)	Dry	2'	12.0'	35°84'93.022	-106°33'52.163
RG-96461 POD 2 (CdV-16-611929)	9.2	2'	13.25	35°84'92.956	-106°33'53.336
RG-96461 POD 3 (CdV-16-611930)	7.3	2'	13.0	35°84'93.394	-106°33'53.245
RG-96461 POD 4 (CdV-16-611931)	7.4	2'	12.0	35°84'94.072	-106°33'52.964
RG-96461 POD 5 (CdV-16-611935)	8.0	2'	9.0	35°84'93.957	-106°33'51.898
RG-96461 POD 6 (CdV-16-611935)	Dry	2'	13.0	35°84'92.474	-106°33'53.537
RG-96461 POD 7 (CdV-16-611935)	Dry	2'	8.5	35°84'94.343	-106°33'54.014
RG-96461 POD 8 (CdV-16-611935)	Dry	2'	12.5	35°84'92.039	-106°33'54.671
RG-96461 POD 9 (CdV-16-611935)	Dry	2'	13.0	35°84'93.022	-106°33'54.368
RG-96461 POD 10 (CdV-16-611935)	Dry	2'	9.0	35°84'94.022	-106°33'52.163

Specific Plugging Conditions of Approval for 10 monitoring wells 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. The use of up to 6% pure bentonite powder ("90 barrel yield") as an additive in cement is allowed under NMOSE/AWWA guidelines. Neither granular bentonite nor extended yield bentonite shall be mixed with cement. When supplementing a cement slurry with bentonite powder as requested, water demand for the mix increases at a rate of 0.65 gallons of water for each 1% increment of bentonite bdwc (by dry weight cement) above fundamental water demand of 5.2 gallons water per 94-lb. sack of cement. A 5% bentonite/cement slurry may therefore contain up to 8.5 gallons of water total per 94-lb. sack of cement / approximate 5-lb. bentonite increment, provided appropriate mixing order is maintained. The bentonite shall be properly hydrated separately with its required increment of water, prior to being added into the cement mixture. If water is otherwise added to the combination of dry ingredients or the dry bentonite blended into wet cement, the hardness and alkalinity imparted to the mix water by the cement will restrict the ability of the bentonite powder to yield as expected, resulting in excess free water in the slurry and enhanced cement shrinkage upon curing.

4. Theoretical volume of sealant required for abandonment of the 2-inch (inside) diameter well is approximately .16 gallons per foot. Total theoretical volume of sealant required to fill the well is tabulated below. All cement mixture will contain no more than 5.2 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)
RG-96461 POD 1	2	12	0.26	2.0
RG-96461 POD 2	2	13.25	0.29	2.2
RG-96461 POD 3	2	13	0.28	2.1
RG-96461 POD 4	2	12	0.26	2.0
RG-96461 POD 5	2	9	0.20	1.5
RG-96461 POD 6	2	13	0.28	2.1
RG-96461 POD 7	2	8.5	0.19	1.4
RG-96461 POD 8	2	12.5	0.27	2.0
RG-96461 POD 9	2	13	0.28	2.1
RG-96461 POD 10	2	9	0.20	1.5
Totals:			2.51	18.8

5. All surface completions (vaults) will be removed, if applicable. An attempt shall be made to pull the casing and backfill the upper 1'-2' bgs with concrete. Casing that is not pulled will be terminated 1'-2' bgs and the remaining hole will be backfilled with concrete to surface.

6. All pumping appurtenance shall be removed from the well prior to decommissioning.

7. The total quantity of all materials and sealants used to complete the decommissioning shall be noted on the plugging record.

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.

The NMOSE Well Plugging Plan of Operations dated September 27, 2016, with annotation, is hereby approved with the aforesaid conditions applied, when signed by an authorized designee of the State Engineer:

Date: 12/12/16

Ramona Martinez, NMOSE District 6, 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: CdV-16-611933 RG-96461 PODS

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8493957 deg, _____ min, _____ sec
Longitude: -106.3351898 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed.

3) Was well used for any type of monitoring program or environmental assessment? Yes 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: 8.0 (feet below land surface) / feet above land surface (circle one)

6) Depth of the well: 9.0 feet

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STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO 2016 SEP 27 AM 10 09

7) Inside diameter of innermost casing: 2 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): 3.0-8.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-2.0 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 1.5 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: Ramon Martinez

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SANTA FE, NEW MEXICO
2016 SEP 27 AM 10: 10

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

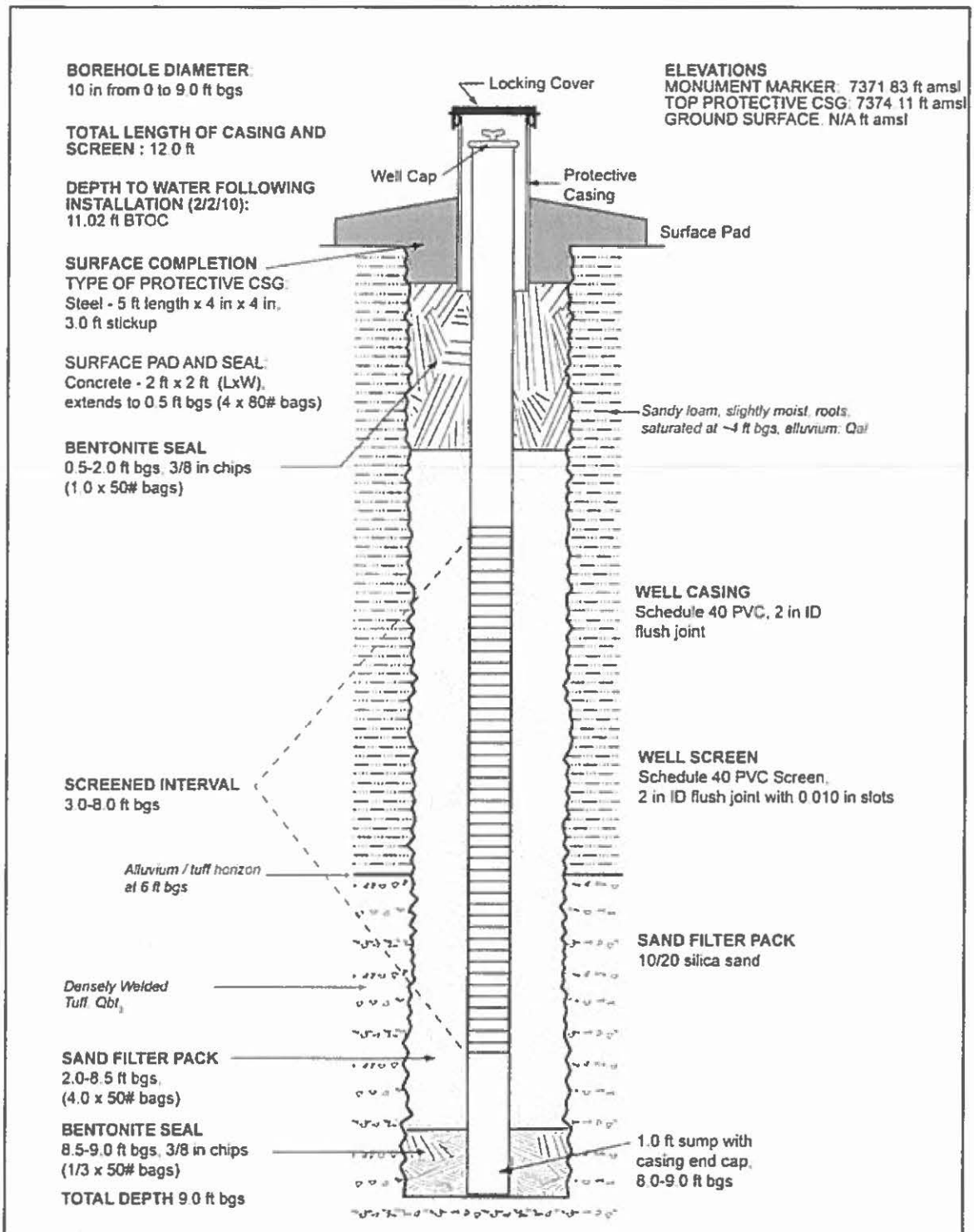
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			9.0
Theoretical volume of grout required per interval (gallons)			1.5 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611933

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: CdV-16-611928 (RAW) 136-964/61 POD6

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling (RAW)

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8492474 (RAW) deg, _____ min, _____ sec
Longitude: -106.3353537 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 13.0 feet

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7) Inside diameter of innermost casing: 2 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): 6.0-11.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-5.0 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.1 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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.

[signature] 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature]

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STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO 2016 SEP 27 AM 10: 09

Trn. No 599956

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

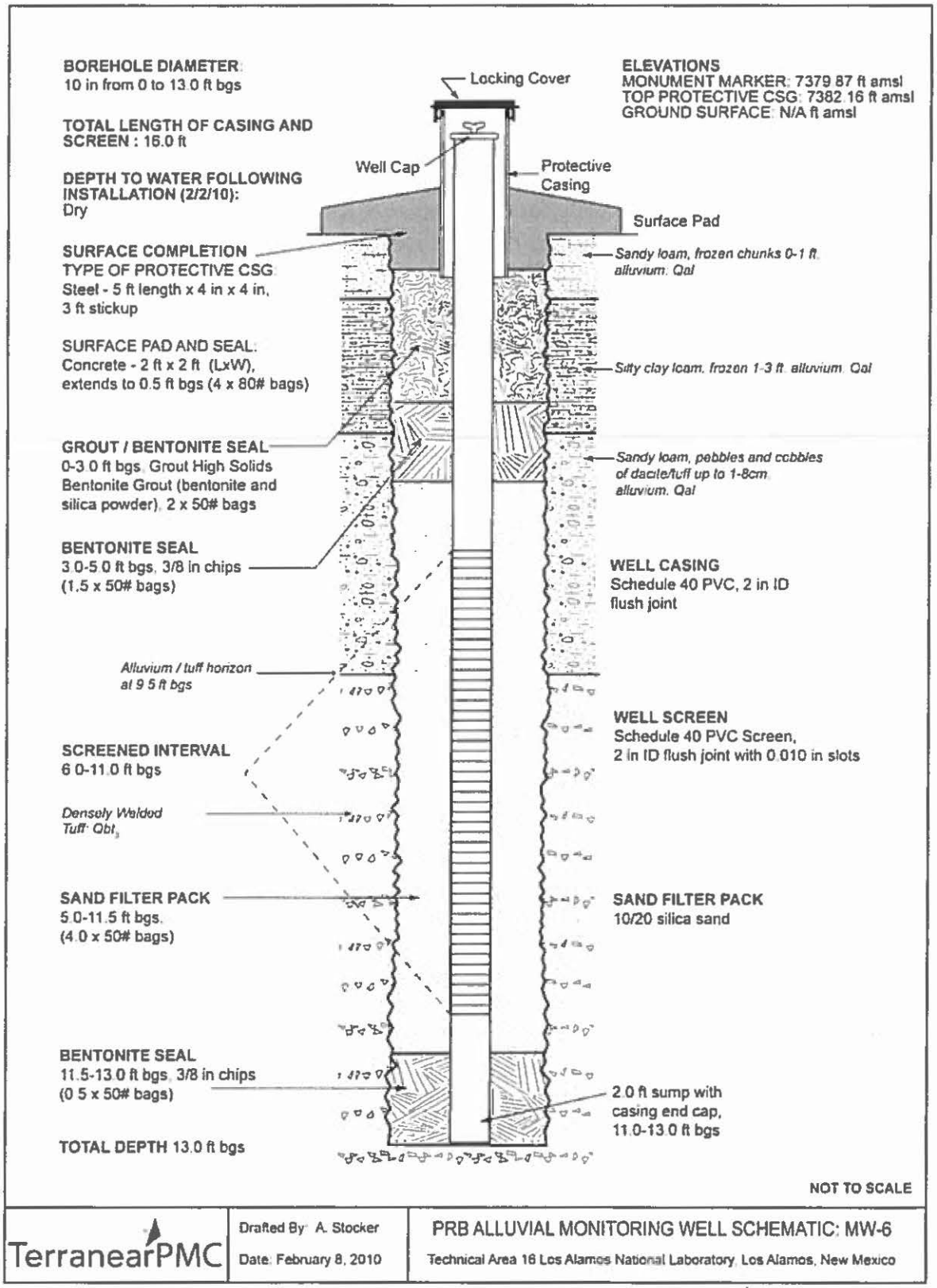
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			13.0
Theoretical volume of grout required per interval (gallons)			2.1 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611928

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: CdV-16-611922 BG-96461 POD7

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/6/18

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: Latitude: 35.849747343 deg, _____ min, _____ sec
Longitude: -106.3354014 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 8.5 feet

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7) Inside diameter of innermost casing: 2 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): 2.0-7.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-1.5 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place

2) Will well head be cut-off below land surface after plugging? yes

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: 1.4 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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

Trn. No 599956

7) Grout additives requested, and percent by dry weight relative to cement: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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 — Signature of Applicant

9/27/16 — 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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: Ramon Hoffman

2016 SEP 27 AM 10:

STATE ENGINEERS OFFICE
SANTA FE, NEW MEXICO

STATE ENGINEER
STATE OF NEW MEXICO

Trn. No 599956

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

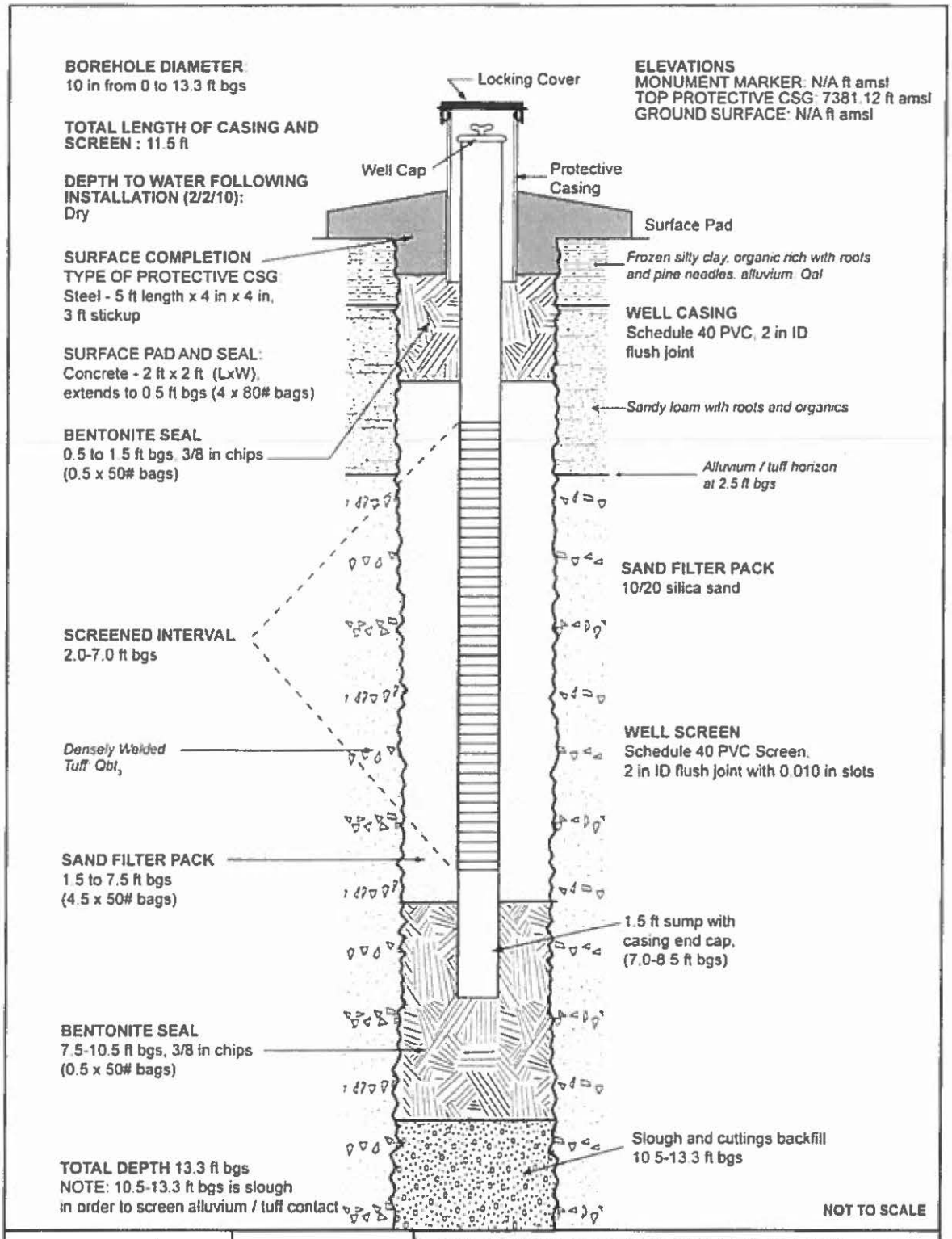
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			8.5
Theoretical volume of grout required per interval (gallons)			1.4 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611922

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: CdV-16-611920 RG-96461 POD8

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8492[illegible]039 deg, _____ min, _____ sec
Longitude: -106.3354671 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 12.5 feet

Trn. No 599956

7) Inside diameter of innermost casing: 2 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): 6.3-11.3

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-1 ft, bentonite 1-4 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.0 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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

Trn. No 599956

7) Grout additives requested, and percent by dry weight relative to cement: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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 — 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: Tomasz Pawlowski

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

2016 SEP 27 AM 10:09

STATE ENGINEERS OFFICE
SANTA FE, NEW MEXICO

Trn. No 599956

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

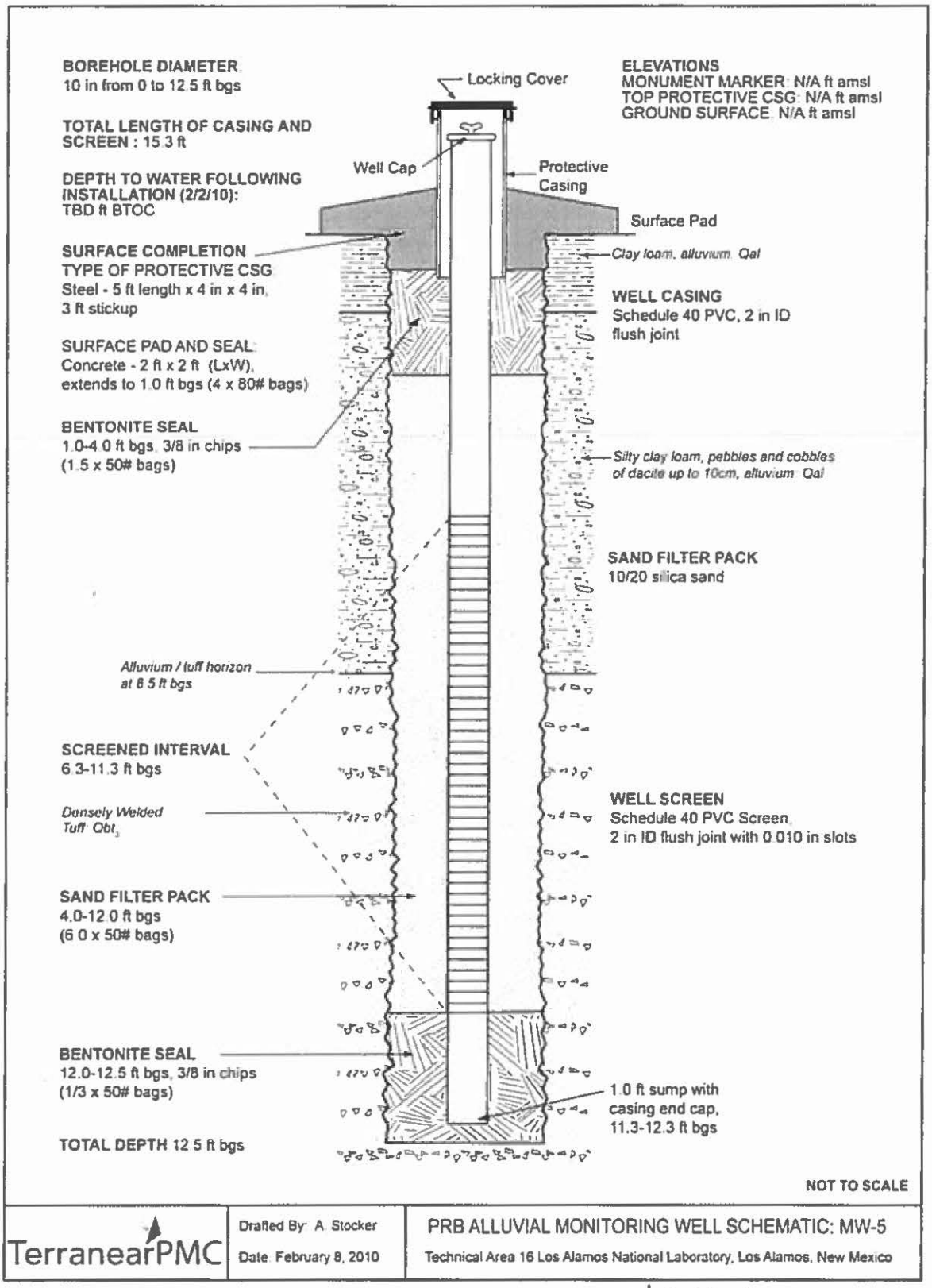
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			12.5
Theoretical volume of grout required per interval (gallons)			2 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611920

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: CdV-16-611921 RG-96461 POD 9 (RW)

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling (RW)

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.849350935 deg, _____ min, _____ sec
Longitude: -106.3354368 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 13.0 feet

STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO 2016 SEP 27 AM 10: 09

Trn. No 599956

7) Inside diameter of innermost casing: 2 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): 6.0-11.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-3.3 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.0 gal

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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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SANTA FE, NEW MEXICO
2016 SEP 27 AM 10:09

Trn. No 599956

7) Grout additives requested, and percent by dry weight relative to cement: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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.

[signature] 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature]

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

2016 SEP 27 AM 10:09

STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO

Trn. No 599956

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

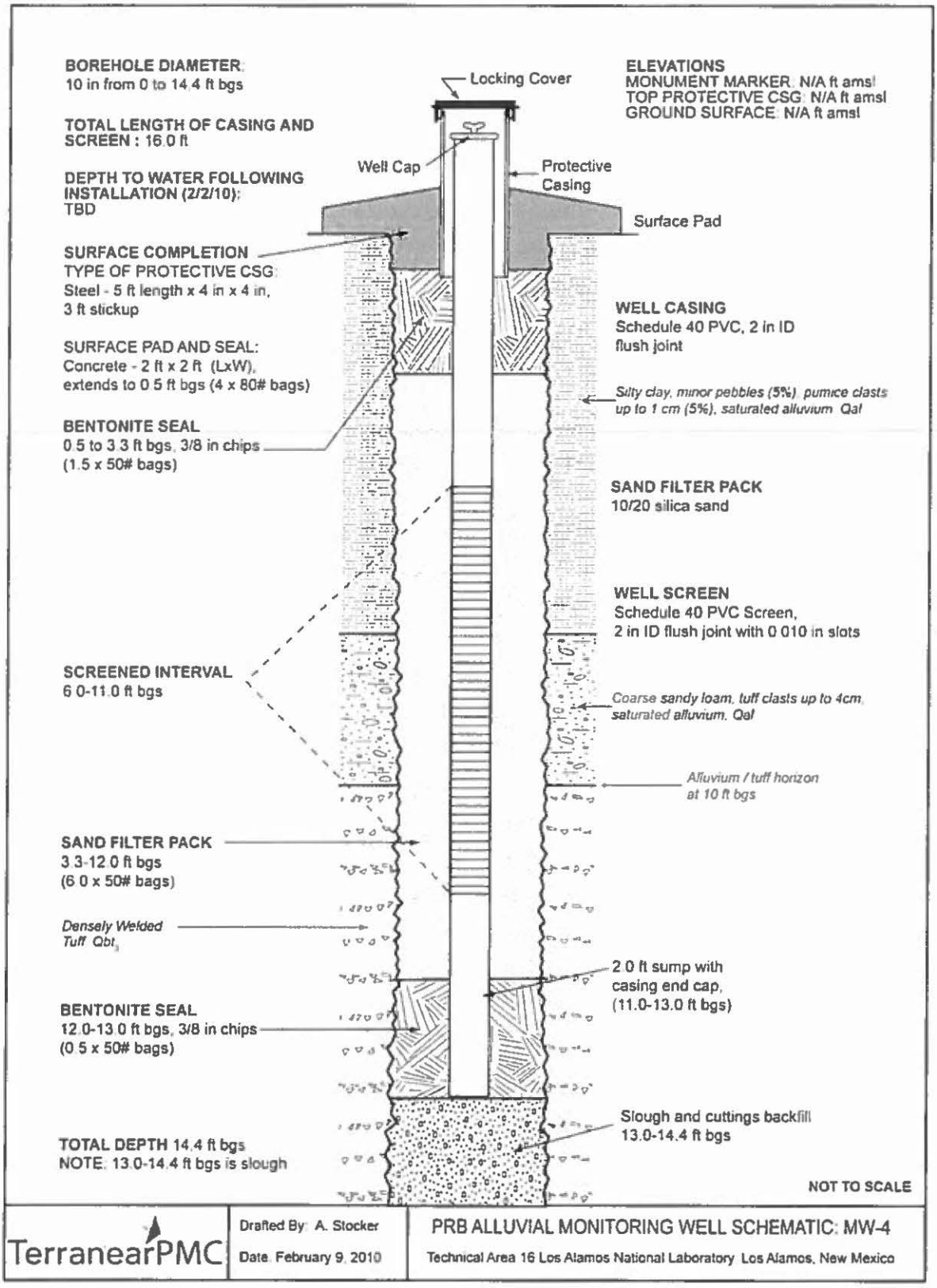
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			13.0
Theoretical volume of grout required per interval (gallons)			2 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611921

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: CdV-16-611932 BG-96461 POD10

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/18/31

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: Latitude: 35.8494614 deg, _____ min, _____ sec
Longitude: -106.3352809 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed.

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 9.0 feet

Trn. No 599956

7) Inside diameter of innermost casing: 2 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): 2.0-7.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-1.7 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 1.5 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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

Trn. No 599956

7) Grout additives requested, and percent by dry weight relative to cement: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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.

[signature] 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature]

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

2016 SEP 27 AM 10: 08

STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO

Trn. No 599956

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

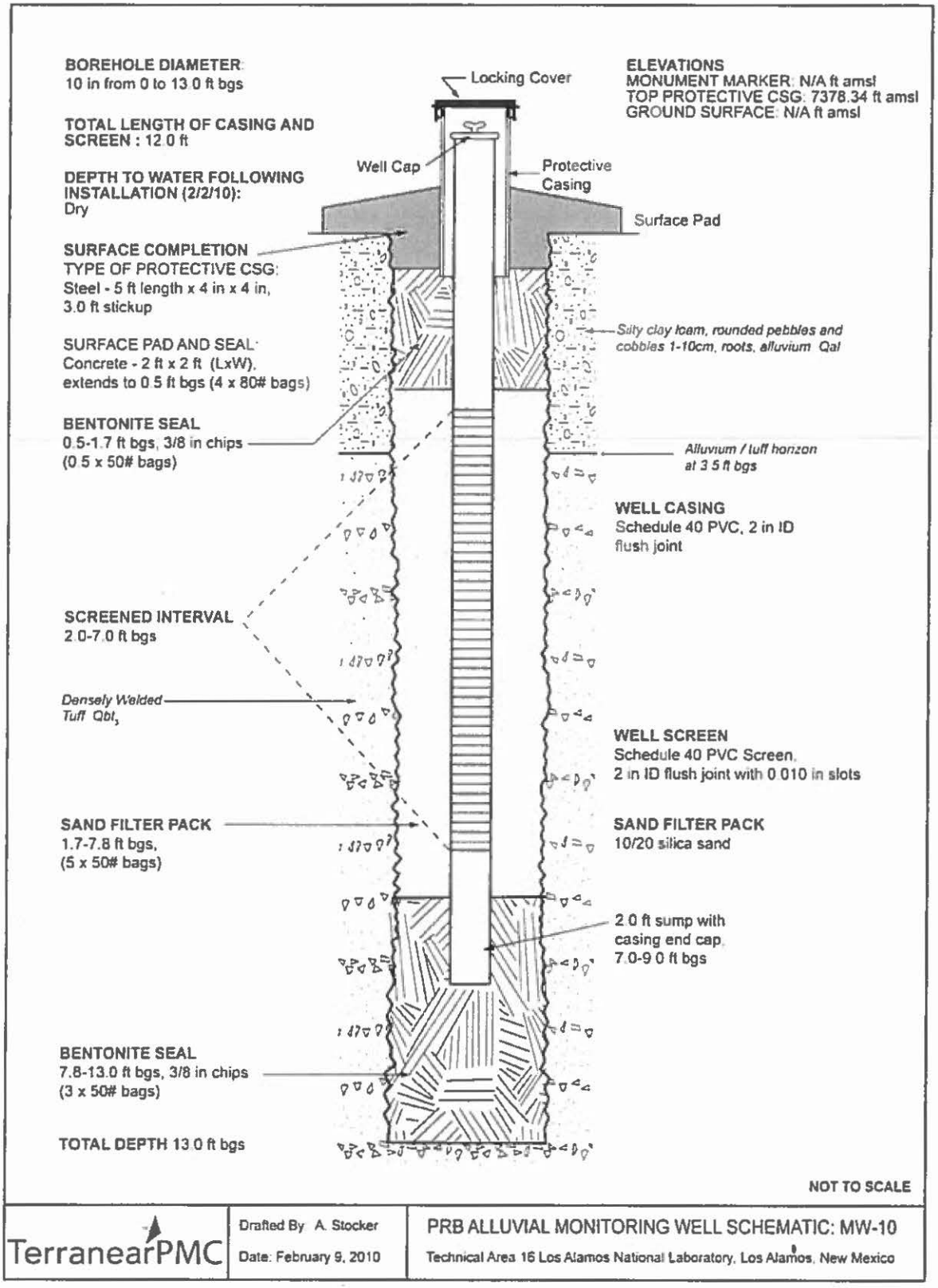
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			9.0
Theoretical volume of grout required per interval (gallons)			1.5 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



CdV-16-611932

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: CdV-16-611931 RM 136-96461 POD4

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling RM

New Mexico Well Driller License No.: WD- 1458 Expiration Date: 10/31/18

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: Latitude: 35.8494082 NM deg, _____ min, _____ sec
Longitude:-106.3352964 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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: 7.4 (feet below land surface) feet above land surface (circle one)

6) Depth of the well: 12.0 feet

Trn. No 599956

STATE ENGINEERS OFFICE
SANTA FE, NEW MEXICO
2016 SEP 30 AM 10:09

7) Inside diameter of innermost casing: 2 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): 5.0-10.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-1.0 ft, bentonite 1.0-3.0 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.0 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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

Trn. No 599956

7) Grout additives requested, and percent by dry weight relative to cement: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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 — 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: Blaine Everett

STATE ENGINEER OFFICE SANTA FE, NEW MEXICO 2016 SEP 27 AM 10:09

Trn. No 599956

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

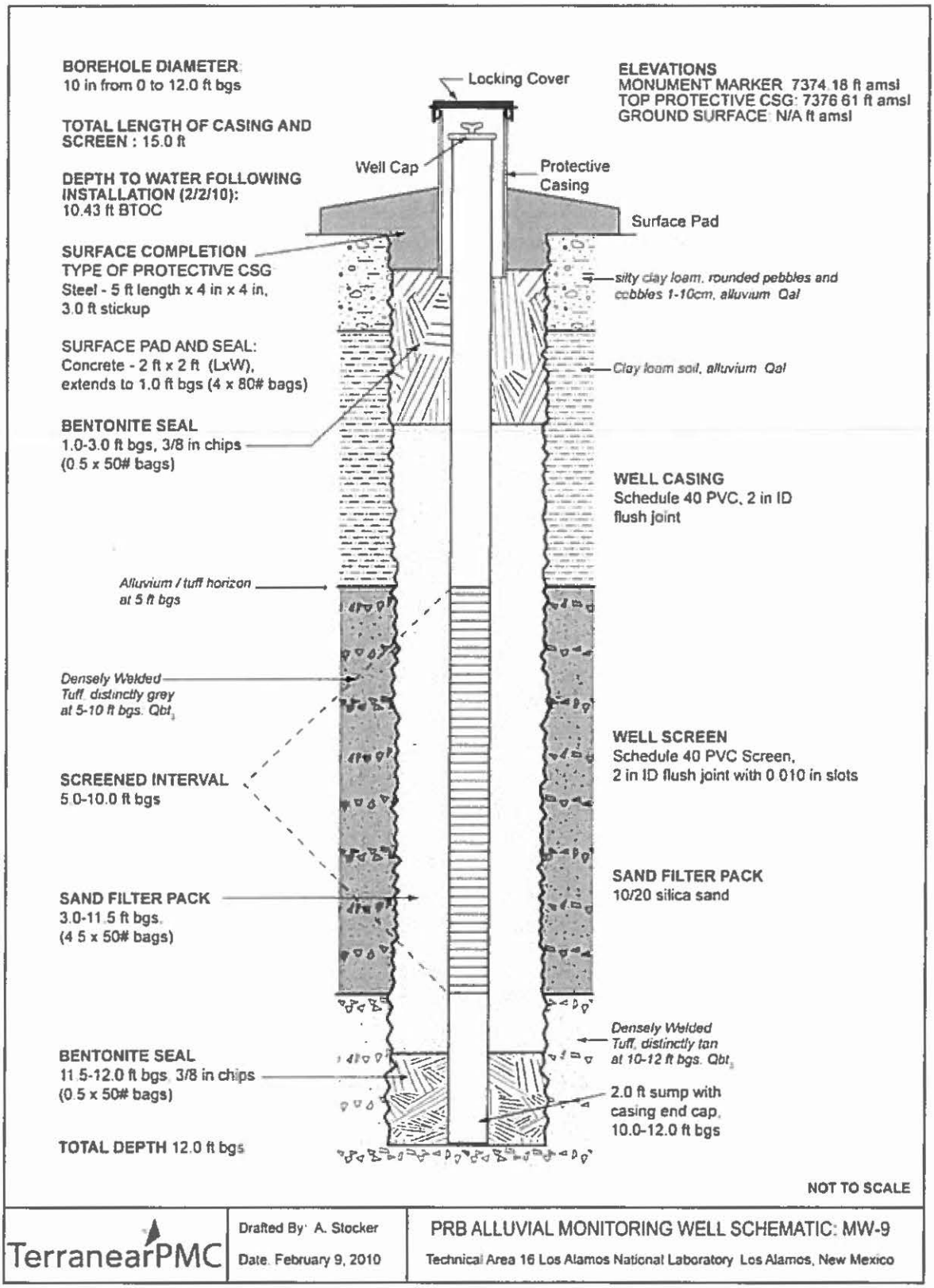
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			12.0
Theoretical volume of grout required per interval (gallons)			2.0 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



cdv-16-611931

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: CdV-16-611930 BG-96461 RM POD3

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling (RM)

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8493394 (NM) deg, _____ min, _____ sec
Longitude: -106.3353245 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed.

3) Was well used for any type of monitoring program or environmental assessment? Yes 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: 7.3 (feet below land surface) / feet above land surface (circle one)

6) Depth of the well: 13.0 feet

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7) Inside diameter of innermost casing: 2 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): 7.0-12.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-5.0 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.1 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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.

[signature] 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature]

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

2016 SEP 27 AM 10:09

STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO

Trn. No 599956

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

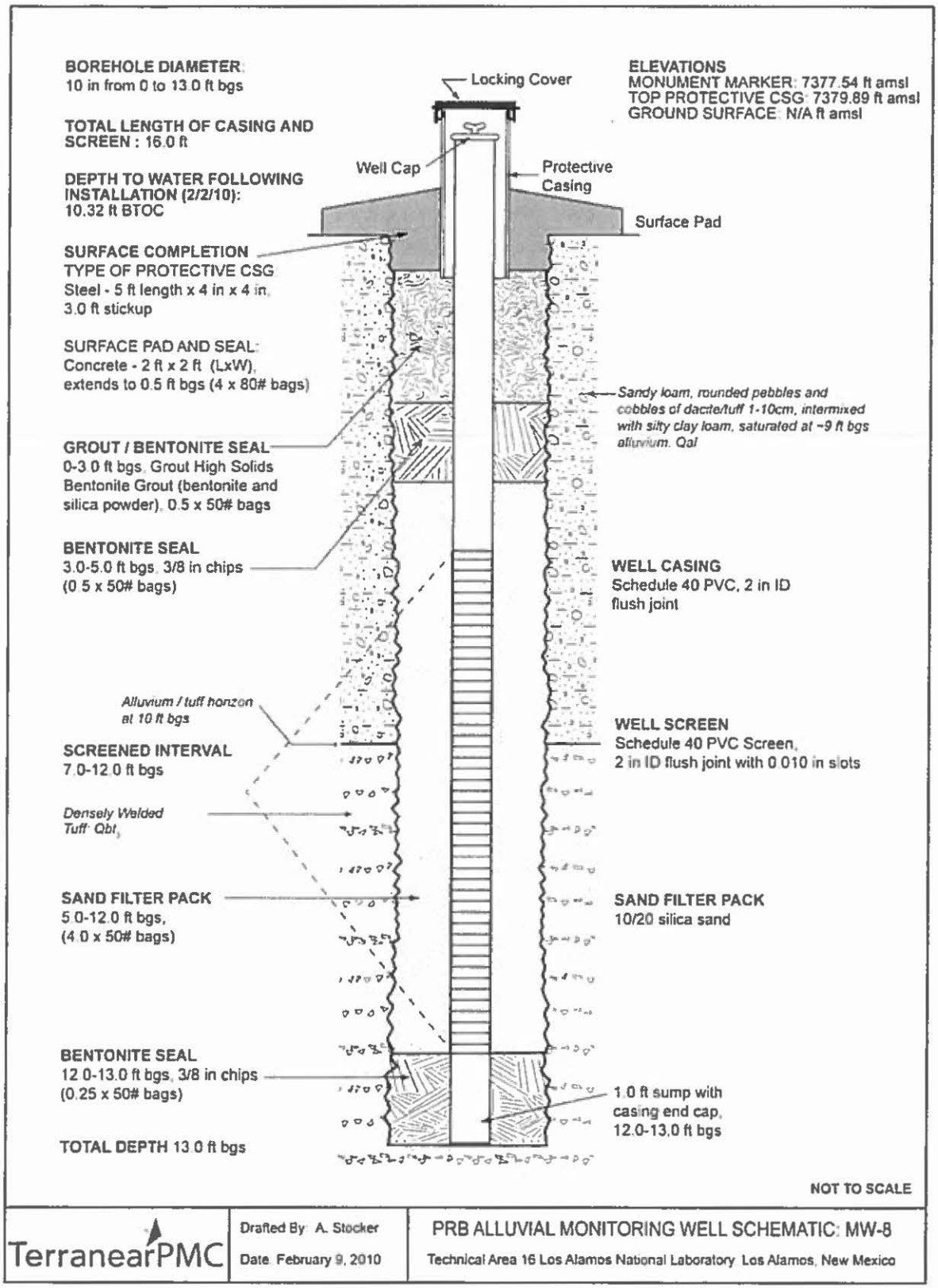
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			13.0
Theoretical volume of grout required per interval (gallons)			2.1 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



CdV-16-611930

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: CdV-16-611929 BG-9646 (RW) POD2

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION: (RW)

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8492956 (RW) deg, _____ min, _____ sec
Longitude: -106.3353336 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed.

3) Was well used for any type of monitoring program or environmental assessment? Yes 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: 9.2 (feet below land surface) feet above land surface (circle one)

6) Depth of the well: 13.25 feet

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STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO 2016 SEP 27 AM 10:09

7) Inside diameter of innermost casing: 2 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): 7.0-12.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-5.3 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place.

2) Will well head be cut-off below land surface after plugging? yes

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: 2.1 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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.

[signature] 9/27/16

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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature]

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

2016 SEP 27 AM 10: 09

STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO

Trn. No 599956

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

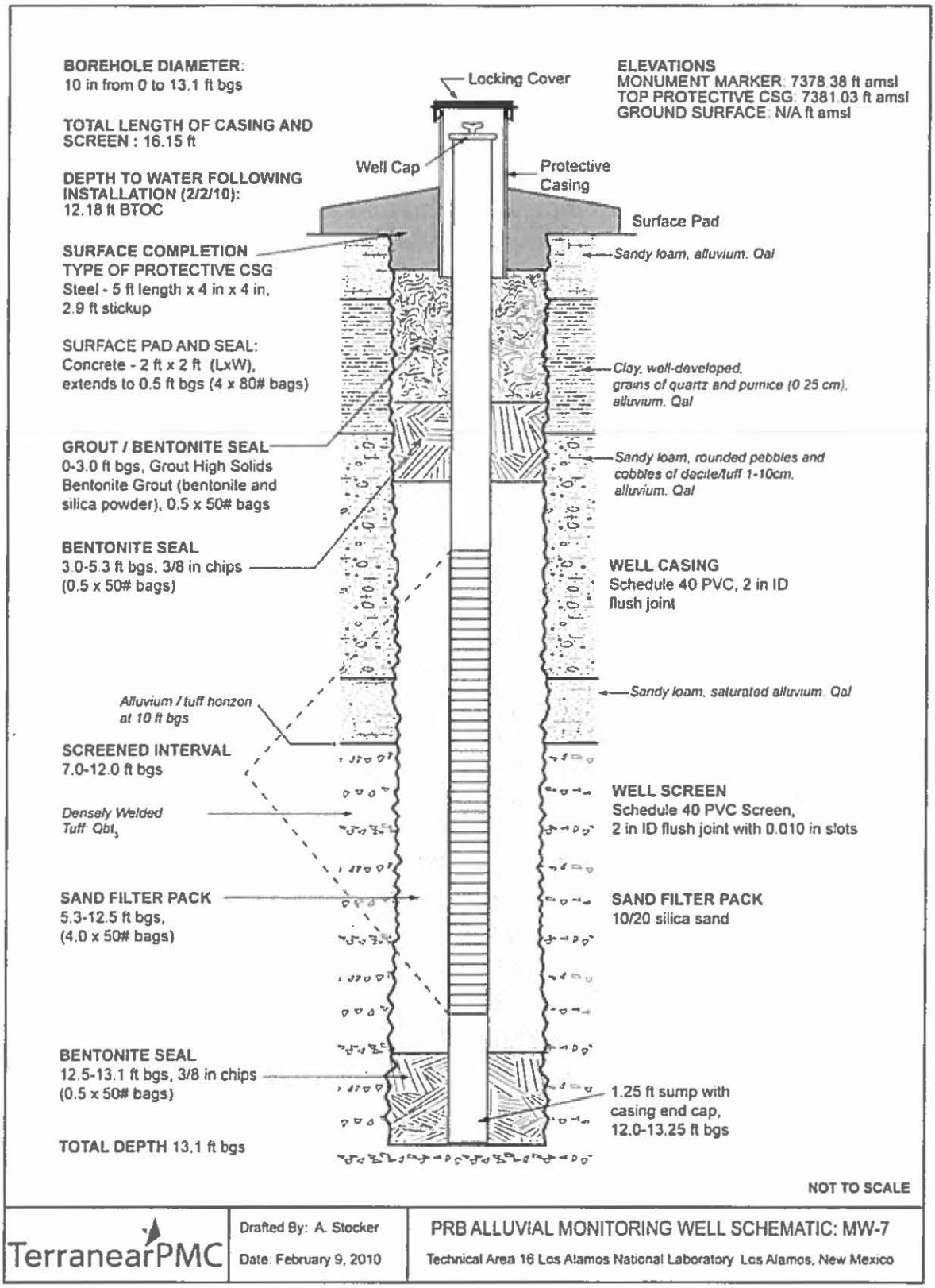
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			13.25
Theoretical volume of grout required per interval (gallons)			2.1 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



CdV-16-611929

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: CdV-16-611935 - RG-96461 POD1

Name of well owner: Los Alamos National Laboratory, Contact: Mark Everett

Mailing address: P.O. Box 1663, MS: M992

City: Los Alamos State: NM Zip code: 87545

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

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: ~~not contracted yet~~ Yellow Jacket Drilling

New Mexico Well Driller License No.: WD-1458 Expiration Date: 10/31/18

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: Latitude: 35.8493022 deg, _____ min, _____ sec
Longitude: -106.3352163 deg, _____ min, _____ sec, NAD 83

2) Reason(s) for plugging well: Well is no longer needed

3) Was well used for any type of monitoring program or environmental assessment? Yes 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)

6) Depth of the well: 12.0 feet

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STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO
2016 SEP 27 AM 10:10

7) Inside diameter of innermost casing: 2 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): 6.0-11.0

10) What annular interval surrounding the artesian casing of this well is cement-grouted? N/A

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: cement 0-0.5 ft, bentonite 0.5-4.0 ft

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: Protective casing and surface pad will be removed. If possible, the PVC casing will be pulled by hand and the hole filled with cement to ground surface. If the PVC cannot be pulled, it will be cut off below ground surface and cemented in place

2) Will well head be cut-off below land surface after plugging? yes

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: 2.0 gal.

4) Type of Cement proposed: cement with up to 5% bentonite

5) Proposed cement grout mix: 8.5 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: Bentonite up to 5%

8) Additional notes and calculations:

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

Well was installed to monitor the performance of a permeable reactive barrier used to remove high explosives from surface/alluvial water.

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 — Signature of Applicant

9/27/16 — 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 12 day of December, 2016

Tom Blaine P.E., New Mexico State Engineer

By: [signature] STATE ENGINEER

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STATE ENGINEERS OFFICE SANTA FE, NEW MEXICO

Trn. No 599956

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

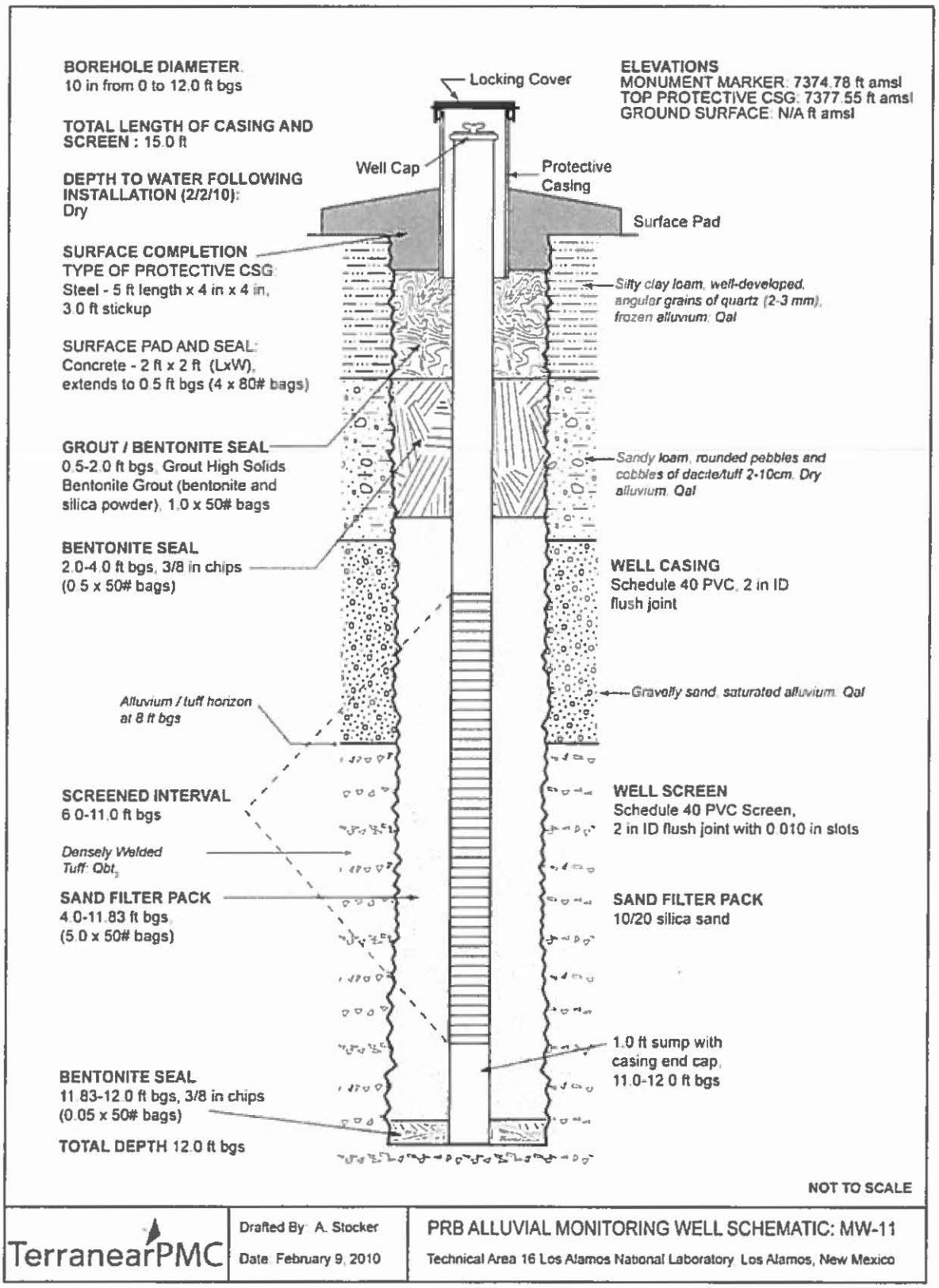
	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			0
Bottom of proposed interval of grout placement (ft bgl)			12.0
Theoretical volume of grout required per interval (gallons)			2.0 gal.
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			8.5 gal.
Mixed on-site or batch-mixed and delivered?			on-site
Grout additive 1 requested			Bentonite
Additive 1 percent by dry weight relative to cement			up to 5%
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

Trn. No

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)			

Trn. No



CdV-16-611935