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Mr. John E. Kieling  
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Santa Fe, NM 87505-6303

APR 08 2019



Dear Mr. Kieling:

Subject: Submittal of the Annual Periodic Monitoring Report for the Technical Area 16 260 Monitoring Group, Revision 1, and the Annual Periodic Monitoring Report for Material Disposal Area AB Monitoring Group, Revision 1

Enclosed please find two hard copies with electronic files of the "Annual Periodic Monitoring Report for the Technical Area 16 260 Monitoring Group, Revision 1," and the "Annual Periodic Monitoring Report for Material Disposal Area AB Monitoring Group, Revision 1."

This report is submitted in response to comments received from the New Mexico Environment Department (NMED) on September 18, 2018; copies of the comments are enclosed.

If you have any questions, please contact Steve Veenis at (505) 309-1362 ([steve.veenis@em-la.doe.gov](mailto:steve.veenis@em-la.doe.gov)) or Hai Shen at (505) 665-5046 ([hai.shen@em.doe.gov](mailto:hai.shen@em.doe.gov)).

Sincerely,

A handwritten signature in black ink.

Arturo Q. Duran  
Compliance and Permitting Manager  
Environmental Management  
Los Alamos Field Office

Enclosures:

1. Annual Periodic Monitoring Report for the Technical Area 16 260 Monitoring Group, Revision 1 (EM2019-0111)
2. Annual Periodic Monitoring Report for Material Disposal Area AB Monitoring Group, Revision 1 (EM2019-0110)

3. NMED Comments of the Annual Periodic Monitoring Report for the Technical Area 16 260 Monitoring Group, August 2018 (Report)
4. NMED Comments of the Annual Periodic Monitoring Report for the Material Disposal Area AB Monitoring Group, August 2018 (Report)

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EM-LA-40AD-00425

April 2019  
EM2019-0110

# **Annual Periodic Monitoring Report for the Material Disposal Area AB Monitoring Group, Revision 1**



Newport News Nuclear BWXT-Los Alamos, LLC (N3B), under the U.S. Department of Energy Office of Environmental Management Contract No. 89303318CEM000007 (the Los Alamos Legacy Cleanup Contract), has prepared this document pursuant to the Compliance Order on Consent, signed June 24, 2016. The Compliance Order on Consent contains requirements for the investigation and cleanup, including corrective action, of contamination at Los Alamos National Laboratory. The U.S. government has rights to use, reproduce, and distribute this document. The public may copy and use this document without charge, provided that this notice and any statement of authorship are reproduced on all copies.

# Annual Periodic Monitoring Report for the Material Disposal Area AB Monitoring Group, Revision 1

April 2019

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Arturo Q. Duran		Compliance and Permitting Manager	Office of Quality and Regulatory Compliance	4/4/2019
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## **EXECUTIVE SUMMARY**

This annual periodic monitoring report (PMR) presents results for the Material Disposal Area (MDA) AB monitoring group of the Newport News Nuclear BWXT-Los Alamos, LLC, groundwater monitoring program that have not been previously reported. All monitoring work reported in this PMR was conducted pursuant to the “Interim Facility-Wide Groundwater Monitoring Plan for the 2017 Monitoring Year, October 2016–September 2017” and the “Interim Facility-Wide Groundwater Monitoring Plan for the 2018 Monitoring Year, October 2017–September 2018,” both prepared in accordance with the Compliance Order on Consent.

This PMR presents monitoring results for two periodic monitoring events (PMEs) conducted during the fourth quarter of monitoring year (MY) 2017 and the second quarter of MY2018 and includes the monitoring of groundwater well or well screen locations. There are no surface-water monitoring locations in the MDA AB monitoring group. This PMR also includes any results from earlier MDA AB monitoring group PMEs that have not yet been reported because validated laboratory data were not available (in some cases because of data release agreements).

Groundwater samples collected during the PMEs were analyzed for metals; volatile organic compounds; semivolatile organic compounds; explosive compounds; radionuclides, including low-level tritium; general inorganic chemicals, including perchlorate; and field parameters (dissolved oxygen, oxidation-reduction potential, pH, specific conductance, temperature, and turbidity).

No groundwater analytical results reported in this PMR were above the applicable screening value.



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- Appendix A Field Parameter Results, Including Results from Previous Four Monitoring Events if Available
- Appendix B Groundwater-Elevation Measurements (on CD included with this document)
- Appendix C Analytical Chemistry Results, Including Results from Previous Four Monitoring Events if Available
- Appendix D Groundwater Results Greater Than Half of Screening Values
- Appendix E Analytical Chemistry Graphs of Screening-Value Exceedances
- Appendix F Analytical Reports (on CD included with this document)

### **Acronyms and Abbreviations**

BCG	Biota Concentration Guide (DOE)
CFR	Code of Federal Regulations (U.S.)
Consent Order	Compliance Order on Consent
DCS	Derived Concentration Technical Standard (DOE)
DOE	Department of Energy (U.S.)
EPA	Environmental Protection Agency (U.S.)
gpm	gallons per minute
HMX	octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
IFGMP	Interim Facility-Wide Groundwater Monitoring Plan
LANL	Los Alamos National Laboratory
MCL	maximum contaminant level (EPA)
MDA	material disposal area
MDL	method detection limit
MY	monitoring year
N	no (best value flag code)
N3B	Newport News Nuclear BWXT-Los Alamos, LLC
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
PME	periodic monitoring event
PMR	periodic monitoring report
QC	quality control
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
TA	technical area
TNT	2,4,6-trinitrotoluene
Y	yes (best value flag code)



## 1.0 INTRODUCTION

This annual periodic monitoring report (PMR) for the Material Disposal Area (MDA) AB monitoring group provides documentation of the following groundwater periodic monitoring events (PMEs) conducted by Los Alamos National Laboratory (LANL or the Laboratory):

Watersheds	PMEs Reported in this PMR		PME Field Sampling	
	MY*	Quarter	Begin	End
Ancho Water	2017	4	09/22/17	09/22/17
	2018	2	03/06/18	03/09/18

\*MY = Monitoring year.

The annual PMR for the MDA AB monitoring group is submitted to the New Mexico Environment Department (NMED) every August and includes MDA AB monitoring group PMEs performed through the second quarter of MY2018. During the third quarter of fiscal year 2018, environmental remediation work transitioned from the Laboratory, under the U.S. Department of Energy (DOE) National Nuclear Security Administration, to Newport News Nuclear BWXT – Los Alamos, LLC (N3B) under the DOE Office of Environmental Management.

Monitoring was conducted pursuant to the “Interim Facility-Wide Groundwater Monitoring Plan for the 2017 Monitoring Year, October 2016–September 2017” (2016 IFGMP) (LANL 2016, 601506) and the “Interim Facility-Wide Groundwater Monitoring Plan for the 2018 Monitoring Year, October 2017–September 2018” (2018 IFGMP) (LANL 2017, 602406), both prepared in accordance with the Compliance Order on Consent (the Consent Order). The PMEs noted above included sampling of groundwater well (or well screen) locations.

This report also includes any results from previous MDA AB monitoring group PMEs that were unreported in their respective PMRs because validated laboratory data were not available (in some cases because of data release agreements). Any additional results from sampling that occurred outside the time frame of a PME are also included in this report.

Section IX of the Consent Order describes the role of data screening in the corrective action process. Screening values are used to identify the *potential* for unacceptable risk resulting from the presence of contaminants in groundwater and surface water. New Mexico Water Quality Control Commission (NMWQCC) groundwater standards, U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs), NMED screening levels for tap water, and EPA regional screening levels for tap water are used to establish a set of screening values for evaluating IFGMP monitoring data. If contaminants are present at concentrations above screening values, additional risk evaluation is required to determine the potential need for cleanup (corrective action).

This report presents the following information:

- general background information on the monitoring group
- field-measurement monitoring results
- water-quality monitoring results
- screening analysis results
- a summary based on the monitoring data and the results of screening analysis

Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with DOE policy.

## **Background**

At MDA AB, groundwater monitoring is conducted to support the corrective measures process for solid waste management units and areas of concern under the Consent Order. The MDA AB monitoring group includes both intermediate-perched and regional groundwater monitoring wells in the near vicinity of MDA AB. Other downgradient wells have general relevance to MDA AB and other upgradient sources but are not considered part of the MDA AB monitoring network and are not included in the monitoring group.

The MDA AB monitoring group is located in Technical Area 49 (TA-49). TA-49, also known as the Frijoles Mesa Site, is located on a mesa in the upper portion of the Ancho Canyon drainage, and part of the TA drains into Water Canyon. The canyons in the Ancho watershed are mainly dry with little alluvial and no known intermediate groundwater.

MDA AB was the site of underground nuclear weapons component testing from 1959 to 1961 (Purtymum and Stoker 1987, 006688; LANL 1988, 223036). The tests involved insufficient high explosives and fissionable material to produce a nuclear reaction. The testing consisted of criticality, equation-of-state, and calibration experiments involving special nuclear materials. The testing involved large inventories of radioactive and hazardous materials: isotopes of uranium and plutonium, lead, and beryllium; high explosives such as TNT (2,4,6-trinitrotoluene), RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine), and HMX (octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine); and barium nitrate. Much of this material remains in shafts on the mesa top. Further information about activities and solid waste management units and areas of concern at TA-49 can be found in recent Laboratory reports (LANL 2016, 601698; LANL 2016, 601699).

## **2.0 SCOPE OF ACTIVITIES**

The PMEs for the MDA AB monitoring group were conducted pursuant to the 2017 IFGMP (LANL 2016, 601506) and the 2018 IFGMP (LANL 2017, 602406).

Table 2.0-1 provides the name, watershed, sample collection date, screened interval, top and bottom screen depths, casing volume, purge volume, and purge or flow rate for each of the planned monitoring locations. These locations are shown in Figure 2.0-1.

## **3.0 REGULATORY CRITERIA**

Regulatory criteria related to groundwater water quality form the basis for the screening values to which groundwater monitoring results are compared in this PMR. These criteria include the NMWQCC groundwater standards, EPA MCLs, NMED screening levels for tap water, and EPA regional screening levels for tap water. These criteria are used to screen results in accordance with the process specified in Section I.X of the Consent Order and are listed in Table 3.0-1. This screening process is described in more detail in section 5.2.

## **4.0 MONITORING RESULTS**

### **4.1 Methods and Procedures**

All methods and procedures used to perform the field activities associated with the data reported in this PMR are documented in the 2017 IFGMP (LANL 2016, 601506) and 2018 IFGMP (LANL 2017, 602406).

## **4.2 Field Parameter Results**

Appendix A presents the field parameter measurements associated with the sampling and analysis data that are reported in this PMR.

## **4.3 Groundwater Elevations**

The groundwater level is measured at each groundwater monitoring location before purging and sampling that location as required by the Consent Order. Section 4.4 notes any instances where this requirement could not be met.

In addition to collecting groundwater-level data before purging and sampling, the Laboratory has collected groundwater-level data “continuously” (e.g., hourly, daily) for most monitoring locations and these data are voluntarily presented in this PMR. Any gaps in the continuous groundwater-level records presented in this PMR are a result of one or more of the following conditions:

- Dry well
- Well not equipped with a pressure (level) transducer
- Water level below transducer
- Transducer not functioning properly (including failure)
- Transducer temporarily removed from well for maintenance and/or calibration

Groundwater-level data for the previous 2 yr are presented in Appendix B (on CD included with this document). For wells equipped with transducers, the reported water level is the water-level measurement taken earliest on the day of sampling. All manual measurements were recorded immediately before sampling. The groundwater-elevation measurements are shown graphically in Figure 4.3-1.

## **4.4 Deviations from Planned Scope**

Table 4.4-1 summarizes the deviations from the planned monitoring scope that were experienced while conducting the work associated with the monitoring data reported in this PMR.

Table 4.4-2 presents a list of analytes with method detection limits (MDLs) greater than screening values. Some of the analytes were measured using more than one analytical method, leading to a range of MDLs. This table applies to the results with the lowest MDL, so the analytical method and analytical laboratory are included in the table for reference.

# **5.0 ANALYTICAL DATA RESULTS**

## **5.1 Methods and Procedures**

All methods and procedures used to perform PME analytical activities are documented in the 2017 IFGMP (LANL 2016, 601506) and the 2018 IFGMP (LANL 2017, 602406). Purge water is managed and characterized in accordance with the waste characterization strategy form associated with the well and the “Land Application of Groundwater” procedure. The “Land Application of Groundwater” procedure implements the NMED-approved decision tree for land application of drilling, development, rehabilitation, and purge water.

All sampling, data reviews, and data package validations were conducted using standard operating procedures (SOPs) that are part of a comprehensive quality assurance program. N3B has transferred ownership of all applicable procedures and is operating to them. Completed chain-of-custody forms serve as analytical request forms and include the requester or owner, sample number, program code, date and time of sample collection, total number of bottles, list of analytes to be measured, bottle sizes, and preservatives for each required analysis.

Data validation determines the quality of an analytical data set and focuses on specific quality assurance samples, such as matrix spikes, duplicates, surrogates, method blanks, and laboratory control samples, and holding times, which indicate the accuracy and precision of the analyses. Based on the results, data qualifiers are applied to indicate data quality issues as well as the usability of results. This process also includes a description of the reasons for any failure to meet method, procedural, or contractual requirements and an evaluation of the impact of such failure on the overall data set.

The required analytical laboratory batch quality control (QC) is defined by the analytical method, the analytical statement of work, and generally accepted industry practices. The analytical laboratory assigns qualifiers to the data to indicate the quality of the analytical results. The laboratory batch QC is used in the secondary data validation process to evaluate the quality of individual analytical results, evaluate the appropriateness of the analytical methodologies, and measure the routine performance of the analytical laboratory.

In addition to batch QC performed by analytical laboratories, in-house field QC samples are submitted to test the overall sampling and analytical laboratory process and to spot-check for analytical problems. The field QC sample results are used in secondary validation along with information provided by the analytical laboratory.

After the analytical laboratory submits data packages, the packages receive in-house secondary validation. As a result of secondary validation, a second set of qualifiers was assigned to the analytical results. Secondary validation is currently done by an automated process after the data are loaded.

Auto validation (1) ensures that the electronic data deliverable contains all the required fields, (2) verifies that results of all QC checks and procedures are within valid criteria limits, and (3) applies specific qualifiers and reason codes per the EPA's National Functional Guidelines for data review as well as the internal data validation SOPa. Once auto validation is complete, the data are uploaded into the internal database system and the public database (<http://intellusnm.com/>).

A detection status is assigned to the analytical result based on the analytical laboratory and secondary validation qualifiers. A detect flag of "N" indicates that, based on the qualifiers, the result was not detected.

## **5.2 Analytical Data**

Appendix C presents the analytical data for the two PMEs reported in this PMR and from the four sampling events at these locations immediately before these PMEs. The analytical laboratory reports (including chain-of-custody forms and data validation forms) are provided in Appendix F (on CD included with this document).

Appendix C contains all data collected during the PMEs (i.e., all data that have been independently reviewed for conformance with Laboratory requirements) with the following constraints:

- All data
  - ❖ Data that are R-qualified (rejected because of noncompliance regarding QC acceptance criteria) during independent validation are considered unusable but are still reported.
  - ❖ Analytical laboratory QC results, including matrix spike and matrix spike duplicates, and field blanks, trip blanks, and equipment blanks are not included in the data set.
  - ❖ Field duplicates, reanalyses, and results from different analytical methods are reported.
- Radionuclides
  - ❖ Only cesium-137, cobalt-60, neptunium-237, potassium-40, and sodium-22 are reported (or analyzed) for the gamma spectroscopy suite.
  - ❖ Americium-241 and uranium-235 are reported only by chemical separation alpha spectroscopy. No gamma spectroscopy results are presented for these analytes.
  - ❖ Other than above, all results are reported at all locations.
- Nonradionuclides
  - ❖ All detected results are reported.

Multiple analyses of a sample, including dilutions and reanalyses, create redundant results. These multiple results have the same sample ID, analytical laboratory code, and analytical method. The analytical and validation information is used to designate the preferred result, which is marked with a best value flag of "Y" (yes). The redundant values of lower quality are assigned a best value flag of "N" (no). In cases where a reanalysis gives a significantly different result than an earlier value, the original result may be rejected and assigned a best value flag of N, and the reanalysis result may be marked with a best value flag of Y. The best value flag is included in Appendix C.

Monitoring data are evaluated using the screening process described below. The sources for standards and screening levels from which specific screening values are established are listed in Table 3.0-1.

- The base-flow monitoring locations are assigned to one of two screening categories—perennial or ephemeral. Along with a hardness value, this category determines the screening values used for data at each monitoring location. Hardness-dependent screening values used to screen data at each base-flow monitoring location are determined using the geometric mean of hardness data (mg/L as calcium carbonate) collected from 2006 to 2010 at each location. Hardness-dependent acute and chronic criteria were used for total recoverable aluminum and dissolved cadmium, chromium, copper, lead, manganese, nickel, silver, and zinc in accordance with the requirements of 20 New Mexico Administrative Code (NMAC) 6.4.900.
- Groundwater data are screened in accordance to Section IX of the Consent Order. For an individual substance, the lower of the NMWQCC groundwater standard or EPA MCL is used as the screening value.

If an NMWQCC groundwater standard or an MCL has not been established for a specific substance for which toxicological information is published, the NMED screening level for tap water is used as the groundwater screening value. The NMED screening levels are for either a cancer- or noncancer-risk type. For the cancer-risk type, the screening levels are based on a  $10^{-5}$  excess cancer risk. This report was prepared using the March 2017 NMED screening levels for tap water.

If an NMED screening level for tap water has not been established for a specific substance for which toxicological information is published, the EPA regional screening level for tap water is used as the groundwater screening value. The EPA screening levels are for either a cancer- or noncancer-risk type. For the cancer-risk type, the Consent Order specifies screening at a  $10^{-5}$  excess cancer risk. The EPA screening levels for tap water are for  $10^{-6}$  excess cancer risk, so 10 times the EPA  $10^{-6}$  screening levels are used in the screening process. This report was prepared using the November 2017 EPA regional screening levels for tap water.

- The NMWQCC groundwater standards apply to the dissolved (filtered) portion of specified contaminants; however, the standards for mercury, organic compounds, and nonaqueous-phase liquids apply to the total unfiltered concentrations of the contaminants. EPA MCLs are applied to both filtered and unfiltered sample results.
- The analytical results for radionuclides and radioactivity are voluntarily compared with the DOE Biota Concentration Guides (BCGs) for surface water and Derived Concentration Technical Standards (DCSs) for groundwater but are not reported in Table 5.2-1 or Appendix D.

Appendix D presents each analytical result that is greater than half of its applicable screening value. Results with a best value flag of N are included in Appendix D but not discussed in the text.

Table 4.2-2 provides groundwater analytical results (by hydrogeologic zone for a specific analytical suite) that are above screening values. Multiple detections are included in the table except for field duplicate exceedances. For example, if aluminum was detected above its screening value in both a primary sample and a field duplicate, only the primary sample result is shown. If aluminum was detected above its screening value in two primary samples, both results are shown. As noted in Table 5.2-1, there were no locations where an analyte was above its screening value for the data reported in this PMR.

For the data reported in this PMR, no analytes exceeded their screening values at more than one sampling location, so no figures showing analyte concentrations are presented in this PMR.

Graphs in Appendix E display analyte concentration histories for monitoring group locations where the analyte was above its screening value at least once in the following expanded data set: data reported in this PMR plus data for the three previous MDA AB monitoring group PMEs. Appendix E may include instances where the analyte data reported in this PMR are evaluated using a higher screening value than the screening value that was used to evaluate previously reported analyte data. For example, the current screening value for perchlorate, 13.8 µg/L per 2016 Consent Order data screening requirements, is greater than the former perchlorate screening value of 4 µg/L, which was used to evaluate previously reported analyte data. The horizontal solid red line on each graph depicts the current analyte screening value, except in cases where there were no exceedances of the current screening value by the data reported in this PMR but there was at least one exceedance of the former (lower) screening value by the previously reported analytical data. In such cases, the horizontal solid red line depicts the former (lower) screening value. Results with a best value flag of N are not included in Appendix E. There were no locations where an analyte was above its screening value at least once during the PMEs reported in this PMR and the three other most recent PMEs, so no graphs are included in Appendix E.

### **5.2.1 Surface Water (Base Flow)**

There are no surface-water monitoring locations in the MDA AB monitoring group.

### **5.2.2 Groundwater**

No groundwater results reported in this PMR were above applicable screening values.

### **5.3 Sampling Program Modifications**

No modifications to the currently planned periodic monitoring of the MDA AB monitoring group are proposed at this time.

## **6.0 SUMMARY AND INTERPRETATIONS**

### **6.1 Monitoring Results**

Appendix A presents the field parameter measurements associated with the sampling and analysis data that are reported in this PMR.

### **6.2 Analytical Results**

#### **6.2.1 Surface Water (Base Flow)**

There are no surface-water monitoring locations in the MDA AB monitoring group.

#### **6.2.2 Groundwater**

No groundwater analytical results reported in this PMR were above screening values.

### **6.3 Data Gaps**

Table 4.4-1 summarizes the deviations from the planned monitoring scope that were experienced while conducting the work associated with the monitoring data reported in this PMR.

### **6.4 Remediation System Monitoring**

Remediation system monitoring is not applicable to the MDA AB monitoring group because no groundwater remediation systems are required for the MDA AB area.

## **7.0 REFERENCES**

*The following reference list includes all documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.*

LANL (Los Alamos National Laboratory), May 1988. "Environmental Surveillance at Los Alamos During 1987," Los Alamos National Laboratory report LA-11306-ENV, Los Alamos, New Mexico. (LANL 1988, 223036)

LANL (Los Alamos National Laboratory), May 2016. "Interim Facility-Wide Groundwater Monitoring Plan for the 2017 Monitoring Year, October 2016–September 2017," Los Alamos National Laboratory document LA-UR-16-23408, Los Alamos, New Mexico. (LANL 2016, 601506)

LANL (Los Alamos National Laboratory), August 2016. "Supplemental Investigation Report for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary," Los Alamos National Laboratory document LA-UR-16-25264, Los Alamos, New Mexico. (LANL 2016, 601698)

LANL (Los Alamos National Laboratory), August 2016. "Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary," Los Alamos National Laboratory document LA-UR-16-25263, Los Alamos, New Mexico. (LANL 2016, 601699)

LANL (Los Alamos National Laboratory), May 2017. "Interim Facility-Wide Groundwater Monitoring Plan for the 2018 Monitoring Year, October 2017–September 2018," Los Alamos National Laboratory document LA-UR-17-24070, Los Alamos, New Mexico. (LANL 2017, 602406)

NMED (New Mexico Environment Department), March 2017. "Risk Assessment Guidance for Site Investigations and Remediation, Volume I Soil Screening Guidance for Human Health Risk Assessments," New Mexico Environment Department, Hazardous Waste Bureau, Santa Fe, New Mexico. (NMED 2017, 602273)

Purtymun, W.D., and A.K. Stoker, November 1987. "Environmental Status of Technical Area 49, Los Alamos, New Mexico," Los Alamos National Laboratory report LA-11135-MS, Los Alamos, New Mexico. (Purtymun and Stoker 1987, 006688)

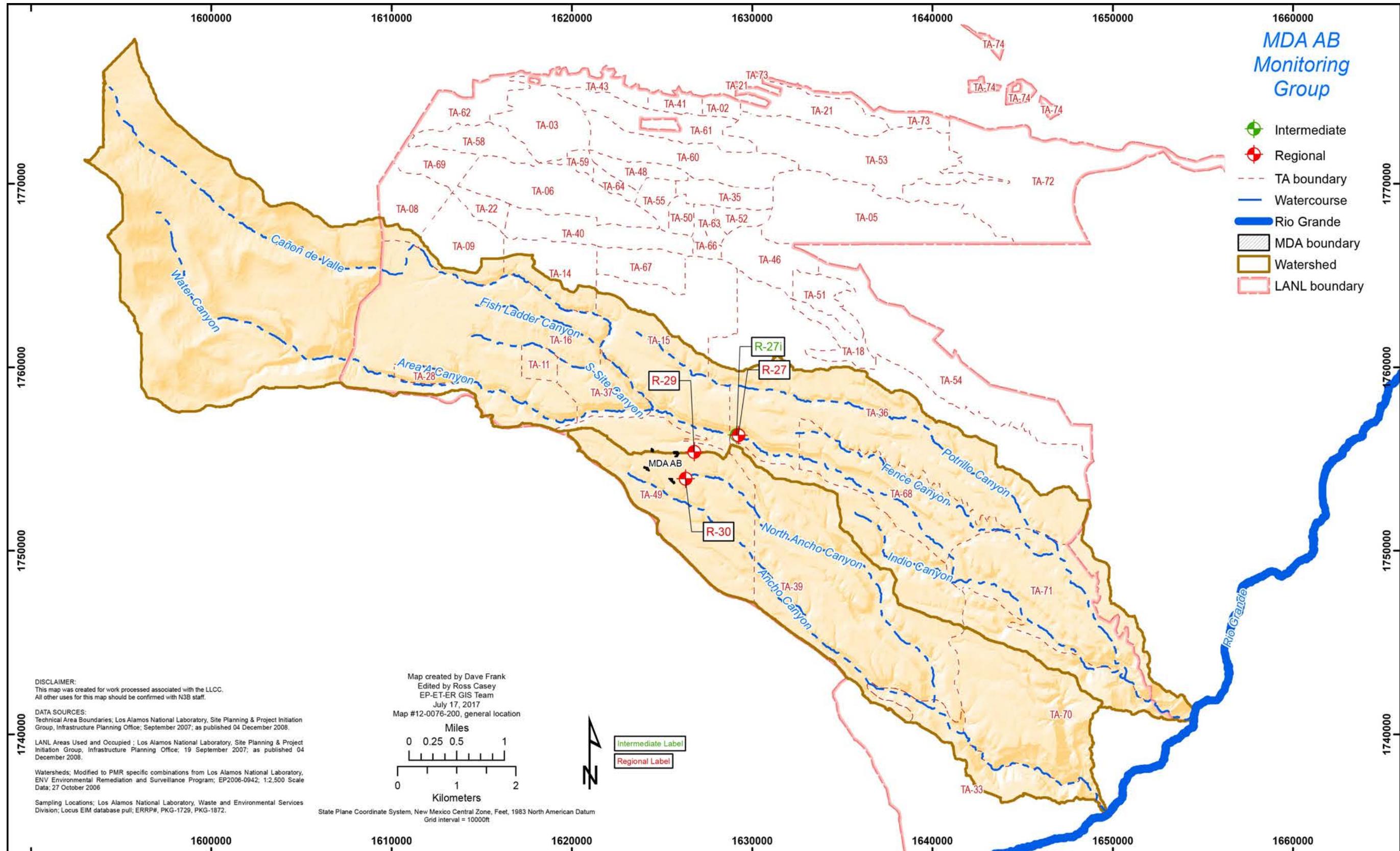


Figure 2.0-1 MDA AB monitoring group locations (see Table 2.0-1)

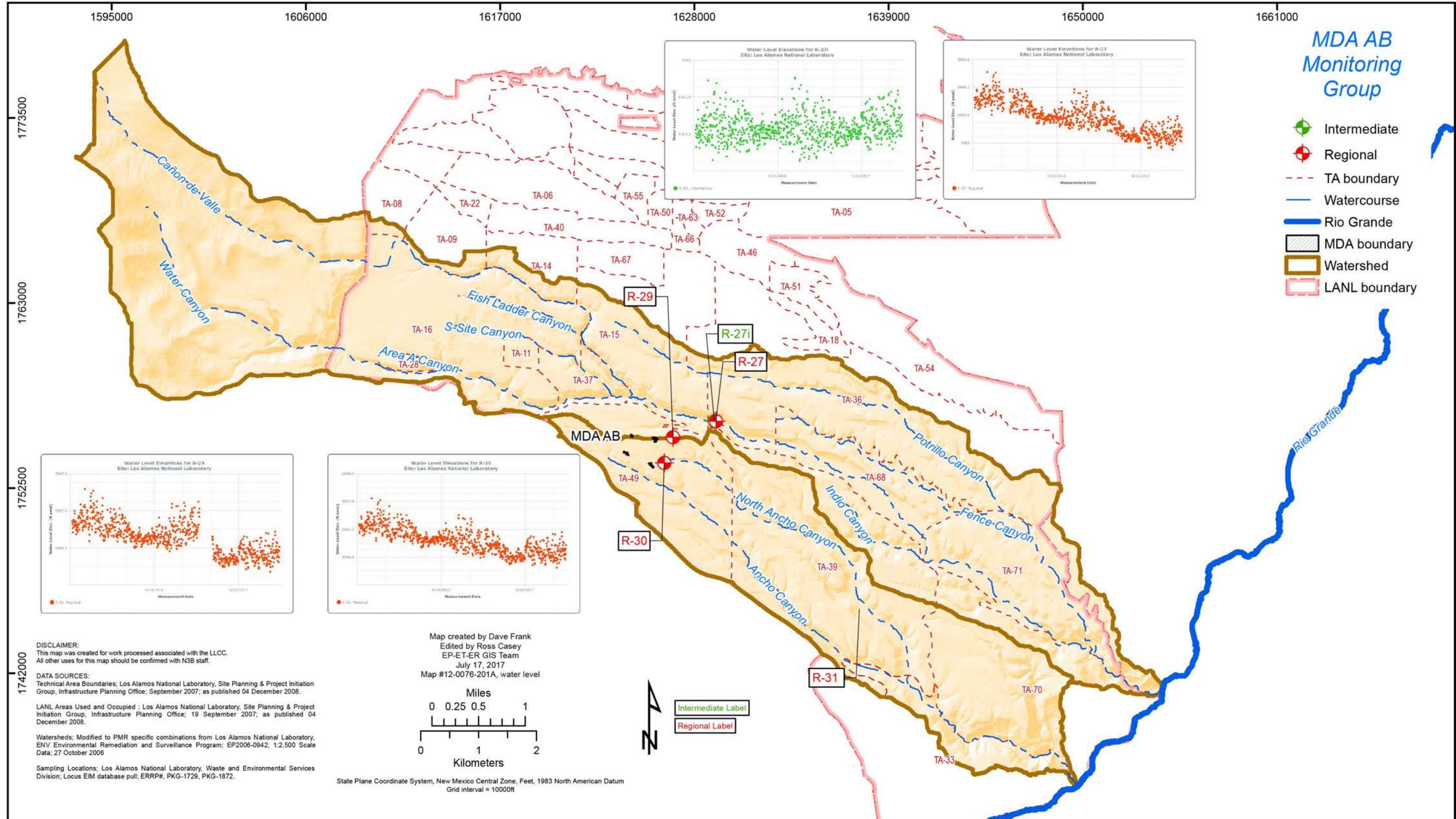


Figure 4.3-1 Groundwater elevations

**Table 2.0-1**  
**MDA AB Monitoring Group PME Locations and General Information**

Location Name	Watershed	Sampling Event		Sample Collection Date	Screened Interval (ft)	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Calculated Single Casing Volume (gal.)	Purge Volume (gal.)	Purge or Flow Rate (gpm*)
		MY	Quarter							
<b>Intermediate</b>										
R-27i	Water	2018	2	03/09/17	10	619	629	13.9	42.8	0.57
<b>Regional</b>										
R-29	Ancho	2017	4	09/22/17	10	1170	1180	39.1	185	7.69
R-30	Ancho			09/22/17	20.9	1140	1160.9	46.6	142	5.7
R-27	Water	2018	2	03/09/18	23	852	875	49.8	162	4.05
R-29	Ancho			03/06/18	10	1170	1180	38.8	202	7.5
R-30	Ancho			03/07/18	20.9	1140	1160.9	47.5	147	5.45

\* gpm = Gallons per minute.

**Table 3.0-1**  
**Sources for Standards and Screening Levels for Groundwater and Surface Water at Los Alamos National Laboratory**

Standard Source	Standard Type	Groundwater	Surface Water
DOE Order 458.1	DOE BCG	n/a <sup>a</sup>	X <sup>b</sup>
DOE Order 458.1	DOE 100-mrem Public Dose DCS	X	n/a
DOE Order 458.1	DOE 4-mrem Drinking Water DCS	X	n/a
40 CFR <sup>c</sup> 141	EPA MCL	X	n/a
NMED Screening Levels <sup>d</sup>	Screening Levels for Tap Water	X	n/a
EPA Regional Screening Levels <sup>e</sup>	Screening Levels for Tap Water	X	n/a
20 NMAC 6.2.3103	NMWQCC Groundwater Standard	X	n/a
20 NMAC 6.4.900.C	NMWQCC Irrigation Standard	n/a	X
20 NMAC 6.4.900.F	NMWQCC Livestock Watering Standard	n/a	X
20 NMAC 6.4.900.G	NMWQCC Wildlife Habitat Standard	n/a	X
20 NMAC 6.4.900.H	NMWQCC Aquatic Life Standards Acute	n/a	X <sup>f, g</sup>
20 NMAC 6.4.900.H	NMWQCC Aquatic Life Standards Chronic	n/a	X <sup>f, g</sup>
20 NMAC 6.4.900.H	NMWQCC Aquatic Life Human Health Standard	n/a	X

<sup>a</sup> n/a = Not applicable.

<sup>b</sup> X = Applied to data screen for this report.

<sup>c</sup> CFR = Code of Federal Regulations.

<sup>d</sup> Reference: "Risk Assessment Guidance for Site Investigations and Remediation," New Mexico Environment Department, March 2017 (NMED 2017, 602273).

<sup>e</sup> Available at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>.

<sup>f</sup> Hardness-based standards for total recoverable aluminum and dissolved chromium(III) conservatively compared with results for total aluminum and dissolved chromium, respectively.

<sup>g</sup> Standard for dissolved chromium(VI) conservatively compared with results for dissolved chromium.

**Table 4.4-1**  
**MDA AB Monitoring Group PME Observations and Deviations**

Monitoring Location	Watershed	Sampling Event		Observation/Deviation	Cause	Comment
		MY	Quarter			
n/a*	n/a	n/a	n/a	There were no observations or deviations to report for this PMR.	n/a	n/a

\* n/a = Not applicable.

**Table 4.4-2**  
**Target Analytes with MDLs above Screening Values**

Analyte Name	MDL	Analytical Method	Screening Value	Unit	Screening-Value Type	Lab ID
<b>Semivolatile Organic Compounds</b>						
Atrazine	3–3.16	SW-846:8270D	3	µg/L	EPA MCL	GELC <sup>a</sup>
Azobenzene	3–3.16	SW-846:8270D	1.2	µg/L	EPA TAP SCRN LVL <sup>b</sup>	GELC
Benzidine	3.9–4.11	SW-846:8270D	0.00109	µg/L	NMED A1 TAP SCRN LVL <sup>c</sup>	GELC
Benzo(a)anthracene	0.3–0.316	SW-846:8270D	0.12	µg/L	NMED A1 TAP SCRN LVL	GELC
Benzo(a)pyrene	0.3–0.316	SW-846:8270D	0.2	µg/L	EPA MCL	GELC
Bis(2-chloroethyl)ether	3–3.16	SW-846:8270D	0.137	µg/L	NMED A1 TAP SCRN LVL	GELC
Dibenz(a,h)anthracene	0.3–0.316	SW-846:8270D	0.0343	µg/L	NMED A1 TAP SCRN LVL	GELC
Dichlorobenzidine[3,3'-]	3–3.16	SW-846:8270D	1.25	µg/L	NMED A1 TAP SCRN LVL	GELC
Dinitro-2-methylphenol[4,6-]	3–3.16	SW-846:8270D	1.52	µg/L	NMED A1 TAP SCRN LVL	GELC
Dinitrotoluene[2,4-]	3–3.16	SW-846:8270D	2.37	µg/L	NMED A1 TAP SCRN LVL	GELC
Dinitrotoluene[2,6-]	3–3.16	SW-846:8270D	0.485	µg/L	NMED A1 TAP SCRN LVL	GELC
Hexachlorobenzene	3–3.16	SW-846:8270D	1	µg/L	EPA MCL	GELC
Hexachlorobutadiene	3–3.16	SW-846:8270D	1.39	µg/L	NMED A1 TAP SCRN LVL	GELC
Nitrobenzene	3–3.16	SW-846:8270D	1.4	µg/L	NMED A1 TAP SCRN LVL	GELC

**Table 4.4-2 (continued)**

Analyte Name	MDL	Analytical Method	Screening Value	Unit	Screening-Value Type	Lab ID
Nitroso-di-n-butylamine[N-]	3–3.16	SW-846:8270D	0.0273	µg/L	NMED A1 TAP SCRN LVL	GELC
Nitroso-di-n-propylamine[N-]	3–3.16	SW-846:8270D	0.11	µg/L	EPA TAP SCRN LVL	GELC
Nitrosodiethylamine[N-]	3–3.16	SW-846:8270D	0.00167	µg/L	NMED A1 TAP SCRN LVL	GELC
Nitrosodimethylamine[N-]	3–3.16	SW-846:8270D	0.00491	µg/L	NMED A1 TAP SCRN LVL	GELC
Nitrosopyrrolidine[N-]	3–3.16	SW-846:8270D	0.37	µg/L	NMED A1 TAP SCRN LVL	GELC
Pentachlorobenzene	3–3.16	SW-846:8270D	3.07	µg/L	NMED A1 TAP SCRN LVL	GELC
Pentachlorophenol	3–3.16	SW-846:8270D	1	µg/L	EPA MCL	GELC
Tetrachlorobenzene[1,2,4,5]	3–3.16	SW-846:8270D	1.66	µg/L	NMED A1 TAP SCRN LVL	GELC
<b>Volatile Organic Compounds</b>						
Acrolein	1.5	SW-846:8260B	0.0415	µg/L	NMED A1 TAP SCRN LVL	GELC
Acrylonitrile	1.5	SW-846:8260B	0.523	µg/L	NMED A1 TAP SCRN LVL	GELC
Chloro-1,3-butadiene[2-]	0.3	SW-846:8260B	0.187	µg/L	NMED A1 TAP SCRN LVL	GELC
Dibromo-3-Chloropropane[1,2-]	0.5	SW-846:8260B	0.2	µg/L	EPA MCL	GELC
Dibromoethane[1,2-]	0.3	SW-846:8260B	0.05	µg/L	EPA MCL	GELC
Dibromomethane	0.3	SW-846:8260B	0.0747	µg/L	NMED A1 TAP SCRN LVL	GELC
Trichloropropane[1,2,3-]	0.3	SW-846:8260B	0.00835	µg/L	NMED A1 TAP SCRN LVL	GELC

Note: This table is applicable to samples reported in this PMR.

<sup>a</sup> GELC = GEL Laboratories, LLC, Division of the GEL Group, Charleston, SC.

<sup>b</sup> EPA TAP SCRN LVL = U.S. Environmental Protection Agency screening level for tap water.

<sup>c</sup> NMED A1 TAP SCRN LVL = New Mexico Environment Department screening level for tap water.

**Table 5.2-1**  
**MDA AB Monitoring Group Groundwater Results above Screening Values**

Location	Date	Analyte	Field Prep Code	Result	Unit	Screening Value	Screening-Value Type
n/a*	n/a	There are no results above screening values for data reported in this PMR.	n/a	n/a	n/a	n/a	n/a

\*n/a = Not applicable.

## **Appendix A**

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*Field Parameter Results, Including Results from  
Previous Four Monitoring Events if Available*



A-1

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-27	852.0	3/9/18	WG <sup>a</sup>	Dissolved Oxygen	6.93	mg/L <sup>b</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	Dissolved Oxygen	7.04	mg/L	CAWA-17-130485
R-27	852.0	3/18/16	WG	Dissolved Oxygen	7.19	mg/L	CAWA-16-110752
R-27	852.0	2/6/15	WG	Dissolved Oxygen	7.02	mg/L	CAWA-15-91341
R-27	852.0	3/7/14	WG	Dissolved Oxygen	7.03	mg/L	CAWA-14-54782
R-27	852.0	3/9/18	WG	Flow (in gpm <sup>c</sup> )	4.05	gpm	CAWA-18-151436
R-27	852.0	03/24/17	WG	Flow (in gpm)	3.84	gpm	CAWA-17-130485
R-27	852.0	03/18/16	WG	Flow (in gpm)	3.41	gpm	CAWA-16-110752
R-27	852.0	02/06/15	WG	Flow (in gpm)	3.33	gpm	CAWA-15-91341
R-27	852.0	03/07/14	WG	Flow (in gpm)	3.75	gpm	CAWA-14-54782
R-27	852.0	3/9/18	WG	Oxidation-Reduction Potential	85.2	mV <sup>d</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	Oxidation-Reduction Potential	58.2	mV	CAWA-17-130485
R-27	852.0	3/18/16	WG	Oxidation-Reduction Potential	186.3	mV	CAWA-16-110752
R-27	852.0	2/6/15	WG	Oxidation-Reduction Potential	64.6	mV	CAWA-15-91341
R-27	852.0	3/7/14	WG	Oxidation-Reduction Potential	102.1	mV	CAWA-14-54782
R-27	852.0	3/9/18	WG	pH	7.89	SU <sup>e</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	pH	7.94	SU	CAWA-17-130485
R-27	852.0	3/18/16	WG	pH	7.77	SU	CAWA-16-110752
R-27	852.0	2/6/15	WG	pH	7.88	SU	CAWA-15-91341
R-27	852.0	3/7/14	WG	pH	7.87	SU	CAWA-14-54782
R-27	852.0	3/9/18	WG	Specific Conductance	118.7	µS/cm <sup>f</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	Specific Conductance	119.2	µS/cm	CAWA-17-130485
R-27	852.0	3/18/16	WG	Specific Conductance	124	µS/cm	CAWA-16-110752
R-27	852.0	2/6/15	WG	Specific Conductance	120	µS/cm	CAWA-15-91341
R-27	852.0	3/7/14	WG	Specific Conductance	122	µS/cm	CAWA-14-54782

A-2

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-27	852.0	3/9/18	WG	Temperature	18.4	deg C <sup>g</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	Temperature	18.3	deg C	CAWA-17-130485
R-27	852.0	3/18/16	WG	Temperature	17.69	deg C	CAWA-16-110752
R-27	852.0	2/6/15	WG	Temperature	18.39	deg C	CAWA-15-91341
R-27	852.0	3/7/14	WG	Temperature	18.44	deg C	CAWA-14-54782
R-27	852.0	3/9/18	WG	Turbidity	0.21	NTU <sup>h</sup>	CAWA-18-151436
R-27	852.0	3/24/17	WG	Turbidity	0.34	NTU	CAWA-17-130485
R-27	852.0	3/18/16	WG	Turbidity	0.39	NTU	CAWA-16-110752
R-27	852.0	2/6/15	WG	Turbidity	0.7	NTU	CAWA-15-91341
R-27	852.0	3/7/14	WG	Turbidity	0	NTU	CAWA-14-54782
R-27i	619.0	3/9/18	WG	Dissolved Oxygen	8.1	mg/L	CAWA-18-151438
R-27i	619.0	3/24/17	WG	Dissolved Oxygen	8.12	mg/L	CAWA-17-130486
R-27i	619.0	3/18/16	WG	Dissolved Oxygen	8.16	mg/L	CAWA-16-110753
R-27i	619.0	2/6/15	WG	Dissolved Oxygen	8.14	mg/L	CAWA-15-91342
R-27i	619.0	3/7/14	WG	Dissolved Oxygen	7.86	mg/L	CAWA-14-54783
R-27i	619.0	3/9/18	WG	Flow (in gpm)	0.57	gpm	CAWA-18-151438
R-27i	619.0	03/24/17	WG	Flow (in gpm)	0.52	gpm	CAWA-17-130486
R-27i	619.0	03/18/16	WG	Flow (in gpm)	0.57	gpm	CAWA-16-110753
R-27i	619.0	02/06/15	WG	Flow (in gpm)	0.65	gpm	CAWA-15-91342
R-27i	619.0	03/07/14	WG	Flow (in gpm)	0.6	gpm	CAWA-14-54783
R-27i	619.0	3/9/18	WG	Oxidation-Reduction Potential	166.9	mV	CAWA-18-151438
R-27i	619.0	3/24/17	WG	Oxidation-Reduction Potential	253.8	mV	CAWA-17-130486
R-27i	619.0	3/18/16	WG	Oxidation-Reduction Potential	293.9	mV	CAWA-16-110753
R-27i	619.0	2/6/15	WG	Oxidation-Reduction Potential	118.6	mV	CAWA-15-91342
R-27i	619.0	3/7/14	WG	Oxidation-Reduction Potential	170.6	mV	CAWA-14-54783

A-3

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-27i	619.0	3/9/18	WG	pH	7.01	SU	CAWA-18-151438
R-27i	619.0	3/24/17	WG	pH	6.96	SU	CAWA-17-130486
R-27i	619.0	3/18/16	WG	pH	6.68	SU	CAWA-16-110753
R-27i	619.0	2/6/15	WG	pH	6.88	SU	CAWA-15-91342
R-27i	619.0	3/7/14	WG	pH	6.99	SU	CAWA-14-54783
R-27i	619.0	3/9/18	WG	Specific Conductance	102	µS/cm	CAWA-18-151438
R-27i	619.0	3/24/17	WG	Specific Conductance	102.4	µS/cm	CAWA-17-130486
R-27i	619.0	3/18/16	WG	Specific Conductance	107	µS/cm	CAWA-16-110753
R-27i	619.0	2/6/15	WG	Specific Conductance	0.6	µS/cm	CAWA-15-91342
R-27i	619.0	3/7/14	WG	Specific Conductance	106	µS/cm	CAWA-14-54783
R-27i	619.0	3/9/18	WG	Temperature	13.8	deg C	CAWA-18-151438
R-27i	619.0	3/24/17	WG	Temperature	13.4	deg C	CAWA-17-130486
R-27i	619.0	3/18/16	WG	Temperature	13.97	deg C	CAWA-16-110753
R-27i	619.0	2/6/15	WG	Temperature	13.48	deg C	CAWA-15-91342
R-27i	619.0	3/7/14	WG	Temperature	13.19	deg C	CAWA-14-54783
R-27i	619.0	3/9/18	WG	Turbidity	0.29	NTU	CAWA-18-151438
R-27i	619.0	3/24/17	WG	Turbidity	0.6	NTU	CAWA-17-130486
R-27i	619.0	3/18/16	WG	Turbidity	0.56	NTU	CAWA-16-110753
R-27i	619.0	2/6/15	WG	Turbidity	1.2	NTU	CAWA-15-91342
R-27i	619.0	3/7/14	WG	Turbidity	0.3	NTU	CAWA-14-54783
R-29	1170.0	3/6/18	WG	Dissolved Oxygen	5.53	mg/L	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Dissolved Oxygen	5.28	mg/L	CAAN-17-144828
R-29	1170.0	3/27/17	WG	Dissolved Oxygen	6.31	mg/L	CAAN-17-130479
R-29	1170.0	8/26/16	WG	Dissolved Oxygen	6.07	mg/L	CAAN-16-124887
R-29	1170.0	3/3/16	WG	Dissolved Oxygen	5.87	mg/L	CAAN-16-110571

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-29	1170.0	9/21/15	WG	Dissolved Oxygen	6.46	mg/L	CAAN-15-104031
R-29	1170.0	3/6/18	WG	Flow (in gpm)	7.5	gpm	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Flow (in gpm)	7.69	gpm	CAAN-17-144828
R-29	1170.0	03/27/17	WG	Flow (in gpm)	7.32	gpm	CAAN-17-130479
R-29	1170.0	08/26/16	WG	Flow (in gpm)	6.81	gpm	CAAN-16-124887
R-29	1170.0	03/03/16	WG	Flow (in gpm)	7.69	gpm	CAAN-16-110571
R-29	1170.0	09/21/15	WG	Flow (in gpm)	7.14	gpm	CAAN-15-104031
R-29	1170.0	3/6/18	WG	Oxidation-Reduction Potential	160.8	mV	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Oxidation-Reduction Potential	240.9	mV	CAAN-17-144828
R-29	1170.0	3/27/17	WG	Oxidation-Reduction Potential	67.1	mV	CAAN-17-130479
R-29	1170.0	8/26/16	WG	Oxidation-Reduction Potential	78.3	mV	CAAN-16-124887
R-29	1170.0	3/3/16	WG	Oxidation-Reduction Potential	135	mV	CAAN-16-110571
R-29	1170.0	9/21/15	WG	Oxidation-Reduction Potential	116.1	mV	CAAN-15-104031
R-29	1170.0	3/6/18	WG	pH	8	SU	CAAN-18-151443
R-29	1170.0	9/22/17	WG	pH	8.14	SU	CAAN-17-144828
R-29	1170.0	3/27/17	WG	pH	7.86	SU	CAAN-17-130479
R-29	1170.0	8/26/16	WG	pH	8.12	SU	CAAN-16-124887
R-29	1170.0	3/3/16	WG	pH	8.36	SU	CAAN-16-110571
R-29	1170.0	9/21/15	WG	pH	8	SU	CAAN-15-104031
R-29	1170.0	3/6/18	WG	Specific Conductance	120.5	µS/cm	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Specific Conductance	120.4	µS/cm	CAAN-17-144828
R-29	1170.0	3/27/17	WG	Specific Conductance	121.4	µS/cm	CAAN-17-130479
R-29	1170.0	8/26/16	WG	Specific Conductance	122.7	µS/cm	CAAN-16-124887
R-29	1170.0	3/3/16	WG	Specific Conductance	125	µS/cm	CAAN-16-110571
R-29	1170.0	9/21/15	WG	Specific Conductance	126	µS/cm	CAAN-15-104031

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Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-29	1170.0	3/6/18	WG	Temperature	18.2	deg C	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Temperature	19.5	deg C	CAAN-17-144828
R-29	1170.0	3/27/17	WG	Temperature	18.8	deg C	CAAN-17-130479
R-29	1170.0	8/26/16	WG	Temperature	19.4	deg C	CAAN-16-124887
R-29	1170.0	3/3/16	WG	Temperature	18.42	deg C	CAAN-16-110571
R-29	1170.0	9/21/15	WG	Temperature	20	deg C	CAAN-15-104031
R-29	1170.0	3/6/18	WG	Turbidity	8.71	NTU	CAAN-18-151443
R-29	1170.0	9/22/17	WG	Turbidity	6.31	NTU	CAAN-17-144828
R-29	1170.0	3/27/17	WG	Turbidity	7.74	NTU	CAAN-17-130479
R-29	1170.0	8/26/16	WG	Turbidity	7.74	NTU	CAAN-16-124887
R-29	1170.0	3/3/16	WG	Turbidity	7.31	NTU	CAAN-16-110571
R-29	1170.0	9/21/15	WG	Turbidity	6.9	NTU	CAAN-15-104031
R-30	1140.0	3/7/18	WG	Dissolved Oxygen	6.97	mg/L	CAAN-18-151446
R-30	1140.0	9/22/17	WG	Dissolved Oxygen	7.00	mg/L	CAAN-17-144829
R-30	1140.0	3/27/17	WG	Dissolved Oxygen	6.92	mg/L	CAAN-17-130480
R-30	1140.0	8/26/16	WG	Dissolved Oxygen	6.82	mg/L	CAAN-16-124883
R-30	1140.0	3/4/16	WG	Dissolved Oxygen	6.88	mg/L	CAAN-16-110572
R-30	1140.0	9/22/15	WG	Dissolved Oxygen	7.21	mg/L	CAAN-15-104032
R-30	1140.0	3/7/18	WG	Flow (in gpm)	5.45	gpm	CAAN-18-151446
R-30	1140.0	9/22/17	WG	Flow (in gpm)	5.7	gpm	CAAN-17-144829
R-30	1140.0	03/27/17	WG	Flow (in gpm)	5.38	gpm	CAAN-17-130480
R-30	1140.0	08/26/16	WG	Flow (in gpm)	5.45	gpm	CAAN-16-124883
R-30	1140.0	03/04/16	WG	Flow (in gpm)	5.77	gpm	CAAN-16-110572
R-30	1140.0	09/22/15	WG	Flow (in gpm)	5.6	gpm	CAAN-15-104032
R-30	1140.0	3/7/18	WG	Oxidation-Reduction Potential	171.3	mV	CAAN-18-151446

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-30	1140.0	9/22/17	WG	Oxidation-Reduction Potential	292.3	mV	CAAN-17-144829
R-30	1140.0	3/27/17	WG	Oxidation-Reduction Potential	205.3	mV	CAAN-17-130480
R-30	1140.0	8/26/16	WG	Oxidation-Reduction Potential	168.37	mV	CAAN-16-124883
R-30	1140.0	3/4/16	WG	Oxidation-Reduction Potential	197.5	mV	CAAN-16-110572
R-30	1140.0	9/22/15	WG	Oxidation-Reduction Potential	162.7	mV	CAAN-15-104032
R-30	1140.0	3/7/18	WG	pH	8.08	SU	CAAN-18-151446
R-30	1140.0	9/22/17	WG	pH	8.11	SU	CAAN-17-144829
R-30	1140.0	3/27/17	WG	pH	7.89	SU	CAAN-17-130480
R-30	1140.0	8/26/16	WG	pH	8.18	SU	CAAN-16-124883
R-30	1140.0	3/4/16	WG	pH	7.9	SU	CAAN-16-110572
R-30	1140.0	9/22/15	WG	pH	7.93	SU	CAAN-15-104032
R-30	1140.0	3/7/18	WG	Specific Conductance	118	µS/cm	CAAN-18-151446
R-30	1140.0	9/22/17	WG	Specific Conductance	118.8	µS/cm	CAAN-17-144829
R-30	1140.0	3/27/17	WG	Specific Conductance	119.1	µS/cm	CAAN-17-130480
R-30	1140.0	8/26/16	WG	Specific Conductance	119.8	µS/cm	CAAN-16-124883
R-30	1140.0	3/4/16	WG	Specific Conductance	124	µS/cm	CAAN-16-110572
R-30	1140.0	9/22/15	WG	Specific Conductance	122	µS/cm	CAAN-15-104032
R-30	1140.0	3/7/18	WG	Temperature	19.6	deg C	CAAN-18-151446
R-30	1140.0	9/22/17	WG	Temperature	20.2	deg C	CAAN-17-144829
R-30	1140.0	3/27/17	WG	Temperature	19.7	deg C	CAAN-17-130480
R-30	1140.0	8/26/16	WG	Temperature	20	deg C	CAAN-16-124883
R-30	1140.0	3/4/16	WG	Temperature	19.72	deg C	CAAN-16-110572
R-30	1140.0	9/22/15	WG	Temperature	20.19	deg C	CAAN-15-104032
R-30	1140.0	3/7/18	WG	Turbidity	0.32	NTU	CAAN-18-151446
R-30	1140.0	9/22/17	WG	Turbidity	0.28	NTU	CAAN-17-144829

Location	Depth(ft)	Date	Field Matrix	Analyte	Result	Unit	Sample
R-30	1140.0	3/27/17	WG	Turbidity	0.65	NTU	CAAN-17-130480
R-30	1140.0	8/26/16	WG	Turbidity	0.5	NTU	CAAN-16-124883
R-30	1140.0	3/4/16	WG	Turbidity	1	NTU	CAAN-16-110572
R-30	1140.0	9/22/15	WG	Turbidity	3	NTU	CAAN-15-104032

<sup>a</sup> WG = Groundwater.

<sup>b</sup> mg/L = Milligrams per liter.

<sup>c</sup> gpm = Gallons per minute.

<sup>d</sup> MV = Millivolts.

<sup>e</sup> SU = Standard unit.

<sup>f</sup>  $\mu$ S/cm = Microsiemens per centimeter.

<sup>g</sup> deg C = Degrees Celsius.

<sup>h</sup> NTU = Nephelometric turbidity unit.



## **Appendix B**

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*Groundwater-Elevation Measurements  
(on CD included with this document)*



## **Appendix C**

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*Analytical Chemistry Results, Including Results from  
Previous Four Monitoring Events if Available*



The following pages provide lists of (1) acronyms, abbreviations, symbols, and various analytical codes; (2) analytical laboratory qualifier codes; and (3) secondary validation flag codes that may be used in Appendix C. Please note that these are comprehensive lists, and this periodic monitoring report may not include all of the terms in the lists.

### **Acronyms and Abbreviations**

Acronym, Abbreviation, or Symbol	Description
<b>Miscellaneous</b>	
%	percent
%D	percent difference
%R	percent recovery
%RSD	percent relative standard deviation
<	Based on qualifiers, the result was a nondetection.
—	none
4,4'-DDD	4,4'-dichlorodiphenyldichloroethane
4,4'-DDT	4,4'-dichlorodiphenyltrichloroethane
BHC	benzene hexachloride
CB	chlorinated biphenyl
CCB	continuing calibration blank
CCV	continuing calibration verification
CLP	Contract Laboratory Program
CRDL	contract-required detection limit
CRI	CDRL check standard
DCG	Derived Concentration Guide (DOE)
DDE	dichlorodiphenyldichloroethylene
DNX	dinitroso-RDX (or hexahydro-1,3-dinitroso-5-nitro-1,3,5-triazine)
DOE	Department of Energy (U.S.)
DQO	data quality objective
EPA	Environmental Protection Agency (U.S.)
GC	gas chromatography
GC/MS	gas chromatography/mass spectrometry
GELC	General Engineering Laboratories, Inc. (used in Environmental Information Management database)
GFAA	graphite furnace atomic absorption
GFPC	gas-flow proportional counter
GW	groundwater
HH OO	Human Health—Organism Only (NMWQCC standard)
HMX	1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HPLC	high-pressure liquid chromatography
ICAL	initial calibration
ICPAES	inductively coupled plasma atomic (optical) emission spectroscopy
ICV	initial calibration verification

**Acronyms and Abbreviations (continued)**

Acronym, Abbreviation, or Symbol	Description
<b>Miscellaneous (continued)</b>	
IDL	instrument detection limit
IS	internal standard
LAL	lower acceptance limit
LANL	Los Alamos National Laboratory
LCS	laboratory control sample
LLEEE	low-level electrolytic extraction
LOC	level of chlorination
LSC	liquid scintillation counting
Lvl	level
MCL	maximum contaminant level (EPA)
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDL	method detection limit
MNX	mononitroso-RDX (or hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine)
MS	matrix spike
MSD	matrix spike duplicate
NM	New Mexico
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
OPR	ongoing precision recovery
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxin
PCDF	polychlorinated dibenzofuran
PQL	practical quantitation limit
Prelim	preliminary
QC	quality control
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RF	response factor
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RRT	relative retention time
RT	retention time
Scr	screening
SDG	sample delivery group
SMO	Sample Management Office
SSC	suspended sediment concentration
SU	standard unit

**Acronyms and Abbreviations (continued)**

Acronym, Abbreviation, or Symbol	Description
<b>Miscellaneous (continued)</b>	
TCDD	tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzofuran
TDS	total dissolved solids
TPH-DRO	total petroleum hydrocarbons—diesel range organics
TNX	trinitroso-RDX (or hexahydro-1,3,5-trinitroso-1,3,5-triazine)
TPU	total propagated uncertainty
UAL	upper acceptance limit
<b>Field Matrix Codes</b>	
W	water
WG	groundwater
WM	snowmelt
WP	persistent flow
WS	base flow
WT	storm runoff
<b>Field Prep Codes</b>	
F	filtered
UF	unfiltered
<b>Lab Sample Type Codes</b>	
CS	client sample
DL	dilution
DUP	duplicate
INIT	initial
RE	reanalysis
REDL	reanalysis dilution
REDP	reanalysis duplicate
RI	reissue
TRP	triplicate
<b>Field QC Type Codes</b>	
EQB	equipment rinsate blank
FB	field blank
FD	field duplicate
FR	field rinsate
FS	field split
FTB	field trip blank
FTR	field triplicate
INB	equipment blank taken during installation and not associated with a sampling event
ITB	trip blank taken during installation and not associated with a sampling event
NA	not applicable

**Acronyms and Abbreviations (continued)**

Acronym, Abbreviation, or Symbol	Description
<b>Field QC Type Codes (continued)</b>	
PEB	performance evaluation blank
PEK	performance evaluation known
REG	regular
RES	resample
SS	special sampling event, data unique
SS-EQB	equipment blank of special sampling event, data unique
SS-FB	field blank of special sampling event, data unique
SS-FD	field duplicate of special sampling event, data unique
SS-FTB	field trip blank of special sampling event, data unique
<b>Analytical Suite Codes</b>	
DIOX/FUR, Diox/Fur	dioxins and furans
DRO	diesel range organics
Geninorg, GENINORG, General Chemistry	general inorganics
GRO	gasoline range organics
HERB	herbicides
HEXP	high explosives
INORGANIC	inorganics
ISOTOPE, Isotope	isotope ratios
LCMS/MS	liquid chromatography mass spectrometry/mass spectrometry
METALS, Metals	metals
PEST/PCB, PESTPCB	pesticides and PCBs
RAD, Rad	radiochemistry
SVOC, SVOA	semivolatile organic compounds
VOC, VOA	volatile organic compounds
<b>Detect Flag and Best Value Flag Codes</b>	
N	no
Y	yes
<b>Lab Codes</b>	
ALTC	Alta Analytical Laboratory, Inc., San Diego, CA
ARSL	American Radiation Services, Inc.
CFA	Cape Fear Analytical, LLC, Wilmington, NC
C-INC	Isotope and Nuclear Chemistry Division (LANL)
COAST	Coastal Science Laboratories, Austin, TX
CST	Chemical Sciences and Technology Division (LANL)
EES6	Hydrology, Geochemistry, and Geology Group (LANL)
ESE	Environmental Sciences & Engineering, Inc., Gainesville, FL
FLD	measurement taken in field

**Acronyms and Abbreviations (continued)**

Acronym, Abbreviation, or Symbol	Description
<b>Lab Codes (continued)</b>	
GELC	General Engineering Laboratories, Inc., Charleston, SC (used in Environmental Information Management data base)
GEO	Geochron Laboratories, Boston, MA
HENV	Health and Environmental Laboratory (Johnson Controls, Northern New Mexico)
HUFFMAN	Huffman Laboratories, Inc., Golden, CO
KA	KEMRON Environmental Services, Inc., Vienna, VA
LVLI	Lionville Laboratory, Inc., Philadelphia, PA
PARA	Paragon Analytics, Inc., Salt Lake City, UT
PEC	Pacific Ecorisk Laboratories, Fairfield, CA
QESL	Quanterra Environmental Services, St. Louis, MO
QST	QST Environmental, Newberry, FL
RECRAP	RCRA Labnet, Lionville, PA
RFWC	Roy F. Weston, Inc., West Chester, PA
SGSW	Paradigm Analytical Laboratories, Inc., Wilmington, NC
SILENS	Stable Isotope Laboratory, Woods Hole, MA
STL2, STR	Severn Trent Laboratories, Inc., Richland, WA (historical)
STLA	Severn Trent Laboratories, Inc., Los Angeles, CA
STSL	Severn Trent Laboratories, Inc., St. Louis, MO
SwRI	Southwest Research Institute, San Antonio, TX
UAZ	University of Arizona, Tucson
UIL	University of Illinois, Urbana-Champaign
UMTL	University of Miami Tritium Lab

Note: A combination of analytical laboratory qualifier codes means that several codes apply.

### Analytical Laboratory Qualifier Codes

Code	Description
*	(Inorganic)—Duplicate analysis (relative percent difference [RPD]) not within control limits.
B	(Organic)—Analyte was present in the blank and the sample. (Inorganic) —Reported value was obtained from a reading that was less than the contract-required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
BJ	See B code and see J code.
BJP	See B code, see J code, and see P code.
BPX	(B) (Organic)—This analyte was detected in the associated laboratory method blank and the sample. (B) (Inorganic)—The result for this analyte was greater than the IDL but less than the CRDL. (P) (Pesticides/PCBs)—The quantitative results for this analyte between the primary and secondary gas chromatography (GC) columns were greater than 25% difference. (P) (SW-846 EPA Method 8310, High-Pressure Liquid Chromatography, [HPLC] Results)—The quantitative results for this analyte between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic)—The result for this analyte should be regarded as not detected.
D	The result for this analyte was reported from a dilution.
DJ	See D code and see J code.
DNA	Did not analyze because equipment was broken.
E	(Organic) Analyte exceeded the concentration range. (Inorganic) The serial dilution was exceeded.
E*	See E code and see * code.
EJ	See E code and see J code.
EJ*	See E code, see J code, and see * code.
EJN	(E) (Organic)—The result for this analyte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (inductively coupled plasma atomic [optical] emission spectroscopy [ICPAES])—The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (graphite furnace atomic absorption [GFAA])—The result for this analyte failed one or more Control Laboratory Program (CLP) acceptance criteria as explained in the case narrative. (J) (Organic/General Inorganics)—The result for this analyte was greater than the method detection limit (MDL) but less than the practical quantitation limit (PQL). (N) (Organic)—The reported analyte is a tentatively identified compound (TIC). (N) (Inorganic)—The result for this analyte in the matrix spike (MS) sample was outside acceptance criteria.
EN	See E code and see N code.
EN*	(E) (Organic)—The result for this analyte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICPAES)—The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA)—The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative. (N) (Organic)—The reported analyte is a TIC. (N) (Inorganic)—The result for this analyte in the MS sample was outside acceptance criteria. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria.
H	(Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded.

### Analytical Laboratory Qualifier Codes (continued)

Code	Description
H*	(H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. * (Organic) and (Inorganic)—The result for this analyte in the laboratory control sample analysis was outside acceptance criteria.
HJ	See H code and see J code.
HJ*	(H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. (J) (Organic/General Inorganics)—The result for this analyte was greater than the MDL but less than the PQL. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria.
INS	(d15N)—The d15N of nitrate is a signature of the nitrate present in a sample. Therefore, nitrate has to be present to have a signature. A d15N value cannot be given to a blank because the blank does not have nitrate. This is different from most analytical methods, where a blank is run with the designator "nondetect" or "detected, but below detection limit."
J	(Inorganic)—The associated numerical value is an estimated quantity. (Organic)—The associated numerical value is an estimated quantity.
J*	See J code and see * code.
JB	See J code and see B code
JN	See J code and see N code.
JN*	See J code, see N code, and see * code.
JP	See J code and see P code.
N	(Inorganic)—Spiked sample recovery was not within control limits.
N*	See N code and see * code.
N*E	See N code, see * code, and see E code.
NE	See N code and see E code.
P	Percent difference between the results on the two columns during the analysis differed by more than 40%.
PJ	See P code and see J code.
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or data exception report.
U	The material was analyzed for but was not detected above the level of the associated numeric value.
U*	See U code and see * code.
UD	See U code and see D code.
UE	See U code and see E code.
UE*	See U code, see E code, and see * code.
UEN	See U code, see E code, and see N code.
UH	See U code and see H code.

### Analytical Laboratory Qualifier Codes (continued)

Code	Description
UH*	(U) (Organic/Inorganic)—The result for this analyte was not detected at the specified reporting limit. (H) (Organic/Inorganic)—The required extraction or analysis holding time for this result was exceeded. * (Inorganic)—The result for this analyte in the laboratory replicate analysis was outside acceptance criteria.
UI	(Rad) Gamma spectroscopy result should be regarded as an uncertain identification.
UN	EPA flag (Inorganic)—Compound was analyzed for but was not detected. Spiked sample recovery was not within control limits.
UN*	EPA flag (Inorganic)—See U code, see N code, and see * code.
UUI	(Rad) Gamma spectroscopy result should be regarded as an uncertain identification, and the analytical lab assigned these gamma spectroscopy results as not detected.
X	The analytical laboratory suspects the result is a nondetect despite positive quantification results.

### Secondary Validation Flag Codes

Code	Description
A	The contractually required supporting documentation for this datum is absent.
I	The calculated sums are considered incomplete because of the lack of one or more congener results.
J	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual.
J-	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.
J+	The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.
JN-	Presumptive evidence of the presence of the material is at an estimated quantity with a suspected negative bias.
JN+	Presumptive evidence of the presence of the material is at an estimated quantity with a suspected positive bias.
N	There is presumptive evidence of the presence of the material.
NJ	(Organic) Analyte has been tentatively identified, and the associated numerical value is estimated based upon a 1:1 response factor to the nearest eluting internal standard.
NQ	No validation qualifier flag is associated with this result, and the analyte is classified as detected.
PM	Manual review of raw data is recommended to determine if the observed noncompliances with quality acceptance criteria adversely impact data use.
R	The reported sample result is classified as rejected because of serious noncompliances regarding quality control (QC) acceptance criteria. The presence or absence of the analyte cannot be verified based on routine validation alone.
U	The analyte is classified as not detected.
UJ	The analyte is classified as not detected, with an expectation that the reported result is more uncertain than usual.



























## MDA AB Monitoring Group Analytical Results and Results from the Four Previous Monitoring Events if Available

Field Sample Result Record #	Location ID	Screen Depth	Sample Date	Sample Type	Field Preparation Code	Analysis Type Code	Sample Purpose	Method Category	Lab Method	Parameter Name	Parameter Code	Detected	Report Result	Lab Uncertainty	Report MDA	Report MDL	Report Units	Best Value Flag	Lab Qualifier	Validation Qualifier	COC #	Field Sample ID	Lab ID
13003062	R-30	1140.0	09/22/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Potassium	K	Y	1.09			0.05	mg/L	Y		NQ	2017-2890	CAAN-17-144827	GELC
12776916	R-30	1140.0	03/27/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Potassium	K	Y	1.19			0.05	mg/L	Y		NQ	2017-1277	CAAN-17-130478	GELC
12544353	R-30	1140.0	08/26/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Potassium	K	Y	1.24			0.05	mg/L	Y		NQ	2016-2218	CAAN-16-124890	GELC
12315387	R-30	1140.0	03/04/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Potassium	K	Y	1.31			0.05	mg/L	Y		NQ	2016-856	CAAN-16-110576	GELC
12123352	R-30	1140.0	09/22/2015	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Potassium	K	Y	1.16			0.05	mg/L	Y		NQ	2015-2366	CAAN-15-104034	GELC
13233954	R-30	1140.0	03/07/2018	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	-23	11.9	40.2		pCi/L	Y	U	U	2018-2098	CAAN-18-151491	GELC
13003119	R-30	1140.0	09/22/2017	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	79.1	30	54.6		pCi/L	Y	UI	U	2017-2890	CAAN-17-144829	GELC
12777356	R-30	1140.0	03/27/2017	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	-37.1	21.1	77.2		pCi/L	Y	U	U	2017-1277	CAAN-17-130480	GELC
12544625	R-30	1140.0	08/26/2016	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	10.7	14.7	60.5		pCi/L	Y	U	U	2016-2218	CAAN-16-124888	GELC
12315613	R-30	1140.0	03/04/2016	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	17.4	24	95.2		pCi/L	Y	U	U	2016-856	CAAN-16-110572	GELC
12123403	R-30	1140.0	09/22/2015	WG	UF	INIT	REG	RAD	EPA:901.1	Potassium-40	K-40	N	-29.6	17.2	58.9		pCi/L	Y	U	U	2015-2366	CAAN-15-104032	GELC
13233836	R-30	1140.0	03/07/2018	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	72			0.053	mg/L	Y		NQ	2018-2098	CAAN-18-151446	GELC
13003064	R-30	1140.0	09/22/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	62.5			0.053	mg/L	Y		NQ	2017-2890	CAAN-17-144827	GELC
12776920	R-30	1140.0	03/27/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	65.2			0.053	mg/L	Y		NQ	2017-1277	CAAN-17-130478	GELC
12544357	R-30	1140.0	08/26/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	65.6			0.053	mg/L	Y		NQ	2016-2218	CAAN-16-124890	GELC
12315389	R-30	1140.0	03/04/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	69.7			0.053	mg/L	Y		NQ	2016-856	CAAN-16-110576	GELC
12123356	R-30	1140.0	09/22/2015	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Silicon Dioxide	SiO2	Y	67.1			0.053	mg/L	Y		NQ	2015-2366	CAAN-15-104034	GELC
13233835	R-30	1140.0	03/07/2018	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	11.2			0.1	mg/L	Y		NQ	2018-2098	CAAN-18-151446	GELC
13003066	R-30	1140.0	09/22/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	10.2			0.1	mg/L	Y		NQ	2017-2890	CAAN-17-144827	GELC
12776919	R-30	1140.0	03/27/2017	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	12			0.1	mg/L	Y		NQ	2017-1277	CAAN-17-130478	GELC
12544356	R-30	1140.0	08/26/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	10.4			0.1	mg/L	Y		NQ	2016-2218	CAAN-16-124890	GELC
12315391	R-30	1140.0	03/04/2016	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	11.1			0.1	mg/L	Y		NQ	2016-856	CAAN-16-110576	GELC
12123355	R-30	1140.0	09/22/2015	WG	F	INIT	REG	INORGANIC	SW-846:6010C	Sodium	Na	Y	10.5			0.1	mg/L	Y		NQ	2015-2366	CAAN-15-104034	GELC
13233955	R-30	1140.0	03/07/2018	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	-0.182	0.853	2.99		pCi/L	Y	U	U	2018-2098	CAAN-18-151491	GELC
13003120	R-30	1140.0	09/22/2017	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	-1.34	1.84	5.47		pCi/L	Y	U	U	2017-2890	CAAN-17-144829	GELC
12777357	R-30	1140.0	03/27/2017	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	0.418	1.59	6.37		pCi/L	Y	U	U	2017-1277	CAAN-17-130480	GELC
12544626	R-30	1140.0	08/26/2016	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	-0.896	1.16	4.15		pCi/L	Y	U	U	2016-2218	CAAN-16-124888	GELC
12315614	R-30	1140.0	03/04/2016	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	-0.205	1.15	4.73		pCi/L	Y	U	U	2016-856	CAAN-16-110572	GELC
12123404	R-30	1140.0	09/22/2015	WG	UF	INIT	REG	RAD	EPA:901.1	Sodium-22	Na-22	N	0.665	1.45	5.3		pCi/L	Y	U	U	2015-2366	CAAN-15-104032	GELC
13233879	R-30	1140.0	03/07/2018	WG	F	INIT	REG	GENERAL CHEMISTRY	EPA:120.1	Specific Conductance	SPEC_CONDC	Y	119			1	uS/cm	Y		NQ	2018-2098	CAAN-18-151446	GELC
13003085	R-30	1140.0	09/22/2017	WG	F	INIT	REG	GENERAL CHEMISTRY	EPA:120.1	Specific Conductance	SPEC_CONDC	Y	129			1	uS/cm	Y		NQ	2017-2890	CAAN-17-144827	GELC
12777097	R-30	1140.0	03/27/2017	WG	F	INIT	REG	GENERAL CHEMISTRY	EPA:120.1	Specific Conductance	SPEC_CONDC	Y	121			1	uS/cm	Y		NQ	2017-1277	CAAN-17-130478	GELC
12544567	R-30	1140.0	08/26/2016	WG	F	INIT	REG	GENERAL CHEMISTRY	EPA:120.1	Specific Conductance	SPEC_CONDC	Y	105			3.63	uS/cm	Y		NQ	2016-2218	CAAN-16-124890	GELC
12315457	R-30	1140.0	03/04/2016	WG	F	INIT	REG	GENERAL CHEMISTRY	EPA:120.1	Specific Conductance	SPEC_CONDC	Y	127			3.63	uS/cm	Y		NQ	2016-856	CAAN-16-110576	GELC
12123367	R-30	1140.0	09/22/20																				





## **Appendix D**

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*Groundwater Results Greater Than Half of Screening Values*



There are no results for this periodic monitoring report.



## **Appendix E**

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*Analytical Chemistry Graphs of Screening-Value Exceedances*



There are no results for this periodic monitoring report.



## **Appendix F**

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*Analytical Reports  
(on CD included with this document)*



**CD Table of Contents**

Chain of Custody	Category	Lab	Sample	Date	Location	Screen Top Depth (ft)	Screen Bottom Depth (ft)
2017-2889	Inorganic	GELC <sup>a</sup>	CAAN-17-144826	09/22/17	R-29	1170.0	1180.0
2017-2889	Inorganic	GELC	CAAN-17-144828	09/22/17	R-29	1170.0	1180.0
2017-2889	Organic	GELC	CAAN-17-144828	09/22/17	R-29	1170.0	1180.0
2017-2889	Rad <sup>b</sup>	GELC	CAAN-17-144828	09/22/17	R-29	1170.0	1180.0
2017-2890	Inorganic	GELC	CAAN-17-144827	09/22/17	R-30	1140.0	1160.9
2017-2890	Inorganic	GELC	CAAN-17-144829	09/22/17	R-30	1140.0	1160.9
2017-2890	Organic	GELC	CAAN-17-144829	09/22/17	R-30	1140.0	1160.9
2017-2890	Rad	GELC	CAAN-17-144829	09/22/17	R-30	1140.0	1160.9
2017-2937	Rad	ARSL <sup>c</sup>	CAAN-17-144828	09/22/17	R-29	1170.0	1180.0
2017-2937	Rad	ARSL	CAAN-17-144829	09/22/17	R-30	1140.0	1160.9
2018-2089	Inorganic	GELC	CAAN-18-151443	03/06/18	R-29	1170.0	1180.0
2018-2089	Inorganic	GELC	CAAN-18-151444	03/06/18	R-29	1170.0	1180.0
2018-2089	Organic	GELC	CAAN-18-151444	03/06/18	R-29	1170.0	1180.0
2018-2089	Rad	GELC	CAAN-18-151444	03/06/18	R-29	1170.0	1180.0
2018-2098	Inorganic	GELC	CAAN-18-151446	03/07/18	R-30	1140.0	1160.9
2018-2098	Inorganic	GELC	CAAN-18-151491	03/07/18	R-30	1140.0	1160.9
2018-2098	Organic	GELC	CAAN-18-151491	03/07/18	R-30	1140.0	1160.9
2018-2098	Rad	GELC	CAAN-18-151491	03/07/18	R-30	1140.0	1160.9
2018-2112	Rad	ARSL	CAAN-18-151444	03/06/18	R-29	1170.0	1180.0
2018-2112	Rad	ARSL	CAAN-18-151491	03/07/18	R-30	1140.0	1160.9
2018-2134	Inorganic	GELC	CAWA-18-151436	03/09/18	R-27	852.0	875.0
2018-2134	Inorganic	GELC	CAWA-18-151437	03/09/18	R-27	852.0	875.0
2018-2134	Inorganic	GELC	CAWA-18-151438	03/09/18	R-27i	619.0	629.0
2018-2134	Inorganic	GELC	CAWA-18-151439	03/09/18	R-27i	619.0	629.0
2018-2134	Organic	GELC	CAWA-18-151437	03/09/18	R-27	852.0	875.0
2018-2134	Organic	GELC	CAWA-18-151439	03/09/18	R-27i	619.0	629.0
2018-2134	Rad	GELC	CAWA-18-151437	03/09/18	R-27	852.0	875.0
2018-2134	Rad	GELC	CAWA-18-151439	03/09/18	R-27i	619.0	629.0
2018-2173	Rad	ARSL	CAWA-18-151437	03/09/18	R-27	852.0	875.0
2018-2173	Rad	ARSL	CAWA-18-151439	03/09/18	R-27i	619.0	629.0

<sup>a</sup> GELC = GEL Laboratories, LLC, Division of the GEL Group, Charleston, SC.<sup>b</sup> Rad = Radiochemistry (not gamma).<sup>c</sup> ARSL = American Radiation Services, Inc.

