Response to the Approval with Modification for the 2010 Interim Facility-Wide Groundwater Monitoring Plan, Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-10-048, Dated March 25, 2011

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) modifications and comments are included verbatim. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED modification or comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

PART I: MODIFICATIONS

The NMED has made the following modifications to the Plan, which must be implemented as part of the Approved Plan.

NMED Modification

1. *Suspend sampling of Westbay wells that show residual effects of drilling fluids until the results of the TA-16 Westbay reliability assessment study, which was ordered by the NMED letter dated January 31, 2011, have been reviewed and recommendations developed regarding the final disposition of Westbay wells.*

LANL Response

1. Sampling of Westbay screens significantly impacted by drilling fluids has been suspended. In addition, sampling of two of the Westbay wells evaluated during the reliability assessment study (CdV-R-15-3 and CdV-R-37-2) has been suspended until the final well configuration has been determined. This determination will be made based on the results of the reliability assessment study and the upcoming Water Canyon/Cañon de Valle network assessment.

   Westbay well screens where sampling has been suspended include R-7 screen 3; CdV-R-15-3 (all screens); CdV-R-37-2 (all screens); R-31 (screens 2 and 3); and R-19 (screens 5, 6, and 7). R-26 screen 2 has been plugged and abandoned, and R-26 screen 1 has been reconfigured with a purgeable sampling system and is scheduled for quarterly characterization sampling.

NMED Modification

2. *Discontinue the usage of the Well Screen Analysis Report, Rev. 2 (LANL, May 2007) protocol for evaluating the residual effects of drilling products on the water quality data. Evaluation of the representativeness of water quality data from regional and perched intermediate wells must rely more on trends in field data collected during well purging; physical signs of potential problems with sample quality (e.g., odors, presence of foam or foreign objects, unusual color or turbidity); longer-term (one to three years) water quality trends; presence of chemical indicators of drilling products; anomalous data; and any other factors that might indicate impacts on the quality of water samples. For well*

screens, where representativeness of water quality data is questionable or has not yet been established (e.g., in newly constructed or rehabilitated wells), add dissolved total iron, dissolved total manganese, nitrate as nitrogen, total organic carbon, and sulfate to the list of field parameters that are measured during well purging. These additional field parameters must be collected at least once every casing volume of purged water.

LANL Response

2. The Laboratory has discontinued using the Well Screen Analysis Report, Revision 2, as directed by NMED, and will be using trends in water-quality data to evaluate the representativeness of water quality as presented in Appendix F of the 2011 Interim Facility-Wide Groundwater Monitoring Plan (the Interim Plan).

NMED Modification

3. Section 1.12, Stable Isotope Sampling, second paragraph, page 10:

Monitoring groups MDA C, MDA AB and TA-21 are being investigated under Order. Because thorough characterization of groundwater beneath these sites is required, isotopic signatures are important. Collect stable isotope data for nitrogen, deuterium, and oxygen semiannually at all intermediate and regional monitoring wells in these monitoring groups.

LANL Response

3. The Laboratory proposes to collect stable isotope data for only monitoring-group locations where data are needed to refine the conceptual models for groundwater flow and transport. For the 2011 Interim Plan, stable isotope data for nitrogen, deuterium, and oxygen will be collected for four monitoring groups:

   - Technical Area 21 (TA-21) (Los Alamos Canyon)
   - TA-54 (Pajarito and Mortandad Canyons)
   - Chromium investigation (Sandia and Mortandad Canyons)
   - Material Disposal Area (MDA) C (Mortandad and Pajarito Canyons)

   The hydrologic conceptual model for MDA AB is well-understood, and no technical basis exists for additional sampling of stable isotopes at MDA AB.

   Stable isotope data for nitrogen, deuterium, and oxygen will be collected at selected monitoring locations within these groups to complement ongoing investigations at these sites. Stable isotope data will be collected at locations where fewer than four rounds of stable isotope data have been collected in the past. Additional isotope data may also be collected at some locations within these groups (including those with more than four rounds of data) to further refine the conceptual models for groundwater flow and transport.

NMED Modification

4. Section 3.5, Modifications to the 2009 Interim Plan, first bullet, page 15:

Attempt to remove silt from alluvial well SCA-1. If SCA-1 cannot be rehabilitated and is deemed unreliable for monitoring purposes, use drive point SCA-1P as a substitute for SCA-1.

LANL Response

4. Drivepoint SCA-1-DP is currently being sampled as a replacement for SCA-1 but has also encountered problems with siltation and decreasing yield. On June 14, 2011, the SCA-1-DP drivepoint was removed, and the screen was cleaned with deionized water (Jacobs 2011, 204587). The screen was observed to be in good condition and should show improved performance in future sampling events.

NMED Modification

5. Section 8.5, Modifications to the 2009 Interim Plan, first paragraph, first and third bullets, page 27:

Do not remove Springs 2B and 5B from the White Rock Canyon watershed sampling list. These springs and Spring 5A must be sampled during low Rio Grande flow conditions, preferably between November and January. Sampling during this time period will ensure that river water influence on samples is minimized.

LANL Response

5. Springs 2B and 5B in the White Rock Canyon watershed will be retained on the sampling list. However, the Laboratory proposes to inspect the springs during the routine fall sampling event, and if it is determined river water will not influence the samples, the springs will be sampled. If it is determined river water may compromise the samples, then a return trip to the spring will be made between November and January to collect a sample during more optimal flow conditions.

NMED Modification

6. Figure 1.6-1, pages 34:

Make the following changes to the boundaries of area-specific monitoring groups:

1. *Add well R-1 to the Chromium Investigation Monitoring Group;*
2. *Add wells R-23 and R-23i to the TA-54 Monitoring Group; and*
3. *Add well R-5 to the TA-21 Monitoring Group.*

LANL Response

6. Wells R-1, R-23 and R-23i, and R-5 have been added to the chromium investigation, TA-54, and TA-21 monitoring groups, respectively.

NMED Modification

7. ***Table 1.6-2, pages 51 and 52:***

   Make the following changes to the analytical suites and sampling frequencies for area-specific monitoring groups:

   1. *Characterization sampling of all new intermediate and regional wells must include quarterly sampling and analysis for stable isotopes;*

   2. *For Sandia Canyon alluvial wells in the Chromium Investigation Monitoring Group, sampling and analysis for volatile organic compounds (VOC) and semivolatile organic compounds (SVOC) must be conducted semiannually;*

   3. *For Mortandad Canyon intermediate wells in the Chromium Investigation Monitoring Group, sampling and analysis for VOC must be conducted semiannually;*

   4. *For intermediate and regional wells in the TA-54 Monitoring Groups wells, sampling and analysis for high explosive compounds must be conducted semiannually;*

   5. *For intermediate and regional wells in the MDA C Monitoring Group, sampling and analysis for SVOC and stable isotopes must be conducted semiannually, and for low-level tritium quarterly;*

   6. *For regional wells in the MDA AB Monitoring Group, sampling and analysis for stable isotopes must be conducted semiannually; and*

   7. *For all area-specific monitoring groups, except for the TA-16-260 Alluvial CMI Monitoring Group, schedule triennial sampling for SVOC, pesticides, polychlorinated biphenyls (PCBs), high explosives, and dioxins/furans for all sampling locations that are not planned to be sampled in 2011. The triennial sampling may be staggered over the 2011 to 2013 time frame, but in no event completed later than 2013.*

LANL Response

7. 1. Stable isotope data are routinely collected semiannually as part of characterization sampling for all new intermediate and regional wells.

   2. Because of the predominance of nondetects, the Laboratory proposes to sample for volatile organic compounds (VOCs) annually for all regional wells in the chromium investigation monitoring group. Because the semivolatile organic compound (SVOC) 1,4 dioxane is a known contaminant in the Mortandad Canyon intermediate monitoring wells (MCOI-4, MCOI-5, and MCOI-6), SVOCs will be sampled semiannually in these wells and in the regional wells R-15 and R-42. SVOCs are proposed to be sampled annually in all other regional and intermediate wells in the chromium investigation monitoring group.

   3. Because of the predominance of nondetects, VOCs are proposed to be sampled annually for all regional wells in the chromium investigation monitoring group, except for R-42. VOCs (and SVOCs) are proposed to be sampled semiannually in R-15 and R-42 because these compounds may be located downgradient of a potential recharge zone from contaminated perched-intermediate groundwater from Mortandad Canyon.

4. Because of the predominance of nondetects and because high explosives were not known to have been disposed of at TA-54, sampling for high explosive compounds is proposed to be conducted triennially.

5. Because of the predominance of nondetects, SVOCs are proposed to be sampled annually for older regional wells R-14 and R-46 in the MDA C monitoring group. However, sampling for SVOCs in new wells (including R-60) is proposed to be conducted semiannually. Stable isotopes and low-level tritium for the MDA C monitoring group are proposed to be sampled semiannually.

6. The hydrologic conceptual model for MDA AB is well-understood, and there is no technical basis for sampling for stable isotopes at MDA AB. Sampling for stable isotopes is not proposed to be conducted at MDA AB during the 2011 monitoring year.

7. The analytes SVOCs, pesticides, polychlorinated biphenyls (PCBs), high explosives, and dioxins/furans will be analyzed in samples collected at least triennially at all monitoring locations in all area-specific monitoring groups, except in wells with Westbay screens.

NMED Modification

8. Table 1.6-3, pages 54 - 56:

Make the following changes to the analytical suites and frequencies of sampling for general surveillance monitoring:

1. *For Subgroup B and C springs in White Rock Canyon/Rio Grande, sampling and analysis for high explosive compounds must be conducted annually;*

2. *Characterization sampling of all new intermediate and regional wells must include quarterly sampling and analysis for stable isotopes; and*

3. *For all watersheds, schedule triennial sampling for VOC, SVOC, pesticides, PCBs, high explosives, and dioxins/furans for all sampling locations that are not planned to be sampled in 2011. The triennial sampling may be staggered over the 2011 to 2013 time frame, but in no event completed later than 2013.*

LANL Response

8\. 1. Sampling for high explosive compounds will be conducted annually at all White Rock Canyon springs, except for Sacred Spring, Sandia Spring, and Springs 1, 2, and 2B, where it will be sampled triennially.

2. Characterization sampling of stable isotopes for all new intermediate and regional wells is proposed on a semiannual basis, rather than quarterly, to avoid biasing the isotope data as the geochemistry of the new wells equilibrates towards ambient groundwater chemistry.

3. The sampling for VOCs, SVOCs, pesticides, PCBs, high explosives, and dioxins/furans is scheduled to be conducted triennially or more frequently for all locations, except those wells with Westbay screens.

NMED Modification

9. Table 2.4-1, page 69:

1. Move the sample collection event at Campsite Spring from spring to fall to coincide with base-flow conditions.

2. Add the production well LA-1 to the General Surveillance Monitoring Group. Install a dedicated sampling system in well LA-1 and conduct characterization sampling to determine if groundwater contamination is present.

LANL Response

9. 1. Campsite Spring is grouped within the Guaje general surveillance locations and will be sampled during the fourth quarter of the monitoring year.

   2. Former production well LA-1 was plugged on August 18, 1993 (Purtymun et al. 1995, 092522).

NMED Modification

10. Table 8.4-1, pages 112-113

Sample Ancho Spring and Spring 9B between December and March when flows are higher and springs are more accessible.

LANL Response

10. Ancho Spring and Spring 9B will be sampled during the fall White Rock watershed sampling event, if conditions allow. If flow is too low or access is too difficult, the springs will be resampled between December and March when flows are higher and the springs are more accessible.

NMED Modification

11. Table 8.4-1, page 114:

If base flow in any of the canyons listed in the Table is not reaching the Rio Grande, collect a surface water sample at the first upstream location with sufficient flow that is no farther than 1000 ft from the confluence with the Rio Grande. If the first upstream location with sufficient flow is greater than 1000 ft from Rio Grande, no sampling is required.

LANL Response

11. The Laboratory will include these sampling criteria for canyons listed in Table 8.4-1.

12. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-11:

The Permittees propose to analyze bromide using EPA Method 300.0 that has a practical quantitation limit (PQL) above the corresponding screening level. However, EPA Method 300.1 has a PQL for bromide that is lower than Method 300.0 and can meet the screening level. Analyze bromide by an EPA-approved method that has a PQL lower than the corresponding screening level, such as Method 300.1.

LANL Response

12. Bromide is a naturally occurring substance that is not regulated. It occurs at very low concentrations in waters near the Laboratory. The background value for bromide reflects the detection limit of analyses by an in-house laboratory that produces data for screening purposes only.

    The Laboratory uses U.S. Environmental Protection Agency (EPA) Method EPA:300.0 to analyze for bromide. This method is routine analytical method that has a method detection limit (MDL) of 0.066 mg/L, based on 2010 analytical data. This method is supported by the DOE-approved contract laboratory program.

Note on NMED Modifications 13–19

Modifications 13 to 19 pertain to analytical methods where the practical quantification limit (PQL) for analyzing a contaminant exceeds its respective screening level (referred to as "cleanup level" in the Compliance Order on Consent [the Consent Order]). Responses to Modifications 13 to 19 are provided below for both MDLs and PQLs. These responses are based on the analytical frequency of detection for each analyte, on Consent Order requirements for chemical analyses, and on guidance provided in EPA 530-R-09-007 Unified Guidance (p. 2-7) for PQLs.

Consent Order requirements for chemical analyses are based on MDLs, rather than PQLs. Section X.C, Chemical Analyses, states,

> The detection limits for each method shall be less than applicable background, screening, and regulatory cleanup levels. The preferred method detection limits are a maximum of 20 percent of the cleanup, screening, or background levels. Analyses conducted with detection limits that are greater than applicable background, screening, and regulatory cleanup levels shall be considered data quality exceptions and the reasons for the elevated detection limits shall be reported to the Department. These data cannot be used for statistical analyses.

It should be noted that in general, the PQL is typically 3 to 5 times higher than the MDL. Results greater than the MDL are considered detections. Results greater than the MDL, but less than the PQL, are qualified as estimated (that is, denoted with a "J" flag).

The Laboratory uses nationally accepted analytical methods, including EPA methods and those identified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," also known as SW-846 for determination of contaminants in groundwater and base flow. The Laboratory's primary analytical services provider is GEL Laboratories, LLC. GEL's client base includes 15 DOE sites, 8 districts of the U.S. Army Corps of Engineers, the southern division of the U.S. Navy, several of the largest industrial manufacturers in southeastern U.S., and over 50 nuclear power plants in the U.S.

The Laboratory's analytical services meet EPA requirements for PQLs. Based on EPA 530-R-09-007 Unified Guidance (p. 2-7),

> Any practical quantification limit (PQL) approved by the Regional Administrator under §264.97(h) [or §258.53(g)] that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions available to the facility.

The frequency of detection of an analyte is an excellent indicator of the occurrence of a contaminant. The Laboratory has evaluated the frequency of detection for analytes identified by NMED in Modifications 13 to 19 with PQLs exceeding screening levels, and the results are presented below.

For most of the organic compounds where MDLs or PQLs are higher than the screening levels, the compound has seldom or has never been detected in years of water sampling (see also Table C-4.1-3 for groundwater and Table C-4.1-5 for base flow). If these compounds occurred as contaminants at the Laboratory, wells nearest a contaminant source would detect these compounds at higher concentrations, but this is not the case. For the few instances where MDLs for analytes are higher than the cleanup levels, the MDLs are based on routine laboratory operating conditions available to the Laboratory through the DOE-approved contract laboratory program.

Based on the extremely low frequency of detects for these organic compounds (see Responses to Modifications 13–19 below), the Laboratory's current routine laboratory methods are adequate to analyze for the limited number of analytes where screening levels are below MDLs or PQLs.

NMED Modification

13. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-14:

1. *The Permittees propose to analyze atrazine using EPA Method 8270 that has a PQL above the corresponding screening level. EPA Methods 507, 508.1, 525.2, and 551.1 have PQLs for atrazine that are lower than Method 8270 and can meet the screening level. Analyze atrazine by an EPA-approved method that has a PQL no greater than the corresponding screening level, such as one of the aforementioned methods.*

2. *The Permittees propose to analyze azobenzene using EPA Method 8270 that has a PQL approximately 8 times the corresponding screening level. EPA Method 8270D (with separatory funnel extraction) can achieve a PQL for azobenzene that is lower than the screening level. Analyze azobenzene by an EPA-approved method that has a PQL no greater than the corresponding screening level, such as Method 8270D.*

3. *The Permittees propose to analyze benzidine using EPA Method 8270 that has a PQL approximately five orders of magnitude higher than the corresponding screening level. The Permittees state that EPA Method 605 can achieve much lower PQL for benzidine (approximately two orders of magnitude lower than Method 8270) but did not propose to use that method. Analyze benzidine by EPA Method 605 or another EPA-approved method that has a PQL for benzidine no greater than Method 605.*

LANL Response

13. The Laboratory proposes that its current analytical methods are adequate to analyze atrazine, azobenzene, and benzidine. None of these compounds has been detected in more than 2000 groundwater samples and nearly 300 base-flow samples the Laboratory collected between 2006 and 2010.

    The MDL for atrazine is 3 µg/L, which is equal to the EPA maximum contaminant level (MCL).

    The MDLs for azobenzene and benzidine (2 µg/L and 3 µg/L, respectively) exceed the EPA tap water screening levels. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze these constituents.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS Number	Analyte	Total Samples	Total Detects
Groundwater	1912-24-9	Atrazine	2074	0
Groundwater	103-33-3	Azobenzene	2074	0
Groundwater	92-87-5	Benzidine	2074	0
Base flow	92-87-5	Benzidine	281	0

NMED Modification

14. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-15:

1. *The Permittees propose to analyze benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene using EPA Method 8270 that has PQLs above the corresponding screening levels. The Permittees state that EPA Method 8310 can achieve PQLs that are below the corresponding screening levels but did not propose to use that method. Analyze benzo(a)anthracene, benzo(a)pyrene and benzo(b)fluoranthene by EPA Method 8310 or another EPA-approved method (for example, EPA Method 550, 550.1, 610, or 8270D-SIM) that has PQLs no greater than the corresponding screening levels.*

2. *The Permittees propose to analyze bis(2-chloroethyl)ether using EPA Method 8270 that has a PQL approximately two orders of magnitude higher than the corresponding screening level. The Permittees state that EPA Method 611 can achieve a PQL for bis(2-chloroethyl)ether that is much lower than Method 8270 but did not propose to use Method 611. Analyze bis(2-chloroethyl)ether by EPA Method 611 or another EPA-approved method (for example, Method 8270D) that has a PQL for bis(2-chloroethyl)ether no greater than Method 611.*

3. *The Permittees propose to analyze bis(2-ethylhexyl)phthalate using EPA Method 8270 that has a PQL above the corresponding screening level. EPA Methods 525.2, 625, 8270C, and 8270D can achieve PQLs for bis(2-ethylhexyl)phthalate that are lower than Method 8270 and can meet the screening level. Analyze bis(2-ethylhexyl)phthalate by an EPA-approved method that has a PQL no greater than the corresponding screening level, such as one of the aforementioned methods.*

LANL Response

14. The Laboratory proposes that its current analytical methods are adequate for analyzing (a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, bis(2-chloroethyl)ether, and bis(2-ethylhexyl)phthalate. Between 2006 and 2010, the Laboratory analyzed more than 2000 groundwater samples and nearly 300 base-flow samples for these constituents. The results show very few detections, with the exception of bis(2-ethylhexyl)phthalate, a common analytical laboratory contaminant that may also be derived from sample bottles or sampling equipment.

    The MDLs for benzo(a)anthracene and benzo(b)fluoranthene (0.2 µg/L) are less than the EPA tap water screening level, and the MDL for benzo(a)pyrene (0.2 µg/L) is equal to the EPA MCL.

    The MDL for bis(2-chloroethyl)ether (2 µg/L) exceeds the EPA tap water screening level. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, for analysis of this constituent.

The MDL of 2 µg/L for bis(2-ethylhexyl)phthalate is less than the EPA MCL.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS No.	Analyte	Total Samples	Total Detects
Base flow	56-55-3	Benzo(a)anthracene	281	2
Groundwater	56-55-3	Benzo(a)anthracene	2074	6
Base flow	50-32-8	Benzo(a)pyrene	281	3
Groundwater	50-32-8	Benzo(a)pyrene	2074	9
Base flow	205-99-2	Benzo(b)fluoranthene	281	1
Groundwater	205-99-2	Benzo(b)fluoranthene	2074	10
Base flow	111-44-4	Bis(2-chloroethyl)ether	281	1
Groundwater	111-44-4	Bis(2-chloroethyl)ether	2074	0
Groundwater	117-81-7	Bis(2-ethylhexyl)phthalate	2074	128

NMED Modification

15. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-16:

1. *The Permittees propose to analyze 4-chloroaniline using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 8311 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze 4-chloroaniline by EPA Method 8311 or another EPA-approved method (for example, EPA Method 8270D) that has a PQL no greater than the corresponding screening level.*

2. *The Permittees propose to analyze dibenz(a,h)anthracene using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 8310 can achieve a lower PQL for dibenz(a,h)anthracene than Method 8270. However, Method 8310 does not provide the lowest available PQL for dibenz(a,h)anthracene and does not meet the corresponding screening level. Analyze dibenz(a,h)anthracene by EPA Method 8270D-SIM or another EPA-approved method that has a PQL no greater than the corresponding screening level.*

3. *The Permittees propose to analyze 3,3'-dichlorobenzidine using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 605 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze 3,3'-dichlorobenzidine by EPA Method 605 or another EPA-approved method that has a PQL no greater than the corresponding screening level.*

4. *The Permittees propose to analyze 4,6-dinitro-2-methylphenol using EPA Method 8270 that has a PQL above the corresponding screening level. EPA Methods 528, 8270C-SIM and 8270D can achieve a PQL for 4,6-dinitro-2-methylphenol that is lower than Method 8270 and can meet the screening level. Analyze 4,6-dinitro-2-methylphenol by an EPA-approved method that has a PQL no greater than the corresponding screening level, such as one of the aforementioned methods.*

5. *The Permittees propose to analyze hexachlorobenzene using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 8121 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze hexachlorobenzene by EPA Method 8121 or another EPA-approved method (for*

example, EPA Method 505, 508, 508.1, 525.2, 551.1, 608, 612, or 8081) that has a PQL no greater than the corresponding screening level.

LANL Response

15. The Laboratory proposes that its current analytical methods are adequate to analyze 4-chloroaniline; dibenz(a,h)anthracene; 3,3’-dichlorobenzidine; 4,6-dinitro-2-methylphenol; and hexachlorobenzene. Between 2006 and 2010, the Laboratory analyzed more than 2000 groundwater samples and nearly 300 base-flow samples for these constituents. The results show few or no detections of these compounds.

    The MDL for 4-chloroaniline (2 µg/L) is less than the EPA tap water screening level.

    The MDLs for dibenz(a,h)anthracene; 3,3’-dichlorobenzidine; and 4,6-dinitro-2-methylphenol (0.2 µg/L, 2 µg/L, and 3 µg/L, respectively) exceed the EPA tap water screening level. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze these constituents.

    The MDL for hexachlorobenzene (2 µg/L) exceeds the EPA MCL. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze this constituent.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS No.	Analyte	Total Samples	Total Detects
Groundwater	106-47-8	Chloroaniline[4-]	2074	0
Base flow	53-70-3	Dibenz(a,h)anthracene	281	3
Groundwater	53-70-3	Dibenz(a,h)anthracene	2074	4
Base flow	91-94-1	Dichlorobenzidine[3,3'-]	281	0
Groundwater	91-94-1	Dichlorobenzidine[3,3'-]	2074	0
Groundwater	534-52-1	Dinitro-2-methylphenol[4,6-]	2074	0
Base flow	118-74-1	Hexachlorobenzene	281	0
Groundwater	118-74-1	Hexachlorobenzene	2074	0

NMED Modification

16. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-17:

1. *The Permittees propose to analyze hexachlorobutadiene using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 8121 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze hexachlorobutadiene by EPA Method 8121 or another EPA-approved method (for example, EPA Method 502.2, 524.2, 612, 8021B, 8260B, 8260C, or 8270D) that has a PQL no greater than the corresponding screening level.*

2. *The Permittees propose to analyze indeno(1,2,3-cd)pyrene using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 8310 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze indeno(1,2,3-cd)pyrene by EPA Method 8310 or another EPA-approved method*

(for example, EPA Method 525.2, 550, 550.1, 610, 8270C-SIM, or 8270D-SIM) that has a PQL no greater than the corresponding screening level.

3. *The Permittees propose to analyze n-nitrosodiethylamine using EPA Method 8270, with a PQL approximately four orders of magnitude higher than the corresponding screening level. The Permittees state that EPA Method 521 can achieve a much lower PQL for n-nitrosodiethylamine (approximately three orders of magnitude lower than Method 8270) but did not propose to use Method 521. Analyze n-nitrosodiethylamine by EPA Method 521 or another EPA-approved method that has a PQL for n-nitrosodiethylamine no greater than Method 521.*

4. *The Permittees propose to analyze n-nitrosodimethylamine, n-nitroso-di-n-butylamine, n-nitroso-di-n-propylamine, and n-nitrosopyrrolidine (collectively, nitrosamines) using EPA Method 8270 that has PQLs above the corresponding screening levels. The Permittees state that EPA Method 521 can achieve PQLs that are below the corresponding screening levels but did not propose to use that method. Analyze nitrosamines by EPA Method 521 or another EPA-approved method that has PQLs no greater than the corresponding screening levels.*

LANL Response

16. The Laboratory proposes that its current analytical methods are adequate to analyze hexachlorobutadiene; hexachlorobutadiene; indeno(1,2,3-cd)pyrene; n-nitrosodiethylamine; n-nitrosodimethylamine; n-nitroso-di-n-butylamine; n-nitroso-di-n-propylamine; and n-nitrosopyrrolidine. Between 2006 and 2010, the Laboratory analyzed more than 2000 groundwater samples and nearly 300 base-flow samples for these constituents. The results show few or no detections of these compounds.

    The MDLs for hexachlorobutadiene and indeno(1,2,3-cd)pyrene (0.3 µg/L and 0.2 µg/L, respectively) are less than the EPA tap water screening level.

    The MDLs for n-nitrosodiethylamine, n-nitrosodimethylamine, n-nitroso-di-n-butylamine, n-nitroso-di-n-propylamine, and n-nitrosopyrrolidine (2 µg/L, 2 µg/L, 3 µg/L, 2 µg/L, and 2 µg/L, respectively) exceed their respective EPA tap water screening levels. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze these constituents.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS No.	Analyte	Total Samples	Total Detects
Base flow	193-39-5	Indeno(1,2,3-cd)pyrene	281	4
Groundwater	193-39-5	Indeno(1,2,3-cd)pyrene	2074	5
Groundwater	55-18-5	Nitrosodiethylamine[N-]	2074	0
Groundwater	62-75-9	Nitrosodimethylamine[N-]	2074	0
Groundwater	924-16-3	Nitroso-di-n-butylamine[N-]	2074	0
Base flow	621-64-7	Nitroso-di-n-propylamine[N-]	281	0
Groundwater	621-64-7	Nitroso-di-n-propylamine[N-]	2074	0
Groundwater	930-55-2	Nitrosopyrrolidine[N-]	2074	0

NMED Modification

17. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-18:

1. *The Permittees propose to analyze 2,2'-oxybis(1-chloropropane) using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 611 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze 2,2'-oxybis(1-chloropropane) by EPA Method 611 or another EPA-approved method (for example, EPA Method 625 or 8270D) that has a PQL no greater than the corresponding screening level.*

2. *The Permittees propose to analyze pentachlorophenol using EPA Method 8270 that has a PQL above the corresponding screening level. EPA Methods 515.1, 515.2, 515.3, 515.4, 8041, 8151A, and 8270C-SIM can achieve PQLs for pentachlorophenol that are lower than Method 8270 and can meet the screening level. Analyze pentachlorophenol by an EPA-approved method that has a PQL no greater than the corresponding screening level, such as one of the aforementioned methods.*

3. *The Permittees propose to analyze phenol using EPA Method 8270 that has a PQL above the corresponding screening level. The Permittees state that EPA Method 604 can achieve a PQL that is below the corresponding screening level but did not propose to use that method. Analyze phenol by EPA Method 604 or another EPA-approved method (for example, EPA Method 528, 625, 8270C, 8270C-SIM, or 8270D) that has a PQL no greater than the corresponding screening level.*

4. *The Permittees propose to analyze acrolein using EPA Method 8260 that has a PQL approximately two orders of magnitude higher than the corresponding screening level. The Permittees state that EPA Method 603 can achieve a PQL for acrolein that is lower than Method 8260 but did not propose to use Method 603. Analyze acrolein by EPA Method 603 or another EPA-approved method that has a PQL for acrolein no greater than Method 603.*

5. *The Permittees propose to analyze acrylonitrile using EPA Method 8260 that has a PQL above the corresponding screening level. EPA Method 8260C-SIM can achieve a PQL for acrylonitrile that is lower than Method 8260 and can meet the screening level. The Permittees must analyze acrylonitrile by Method 8260C-SIM or another EPA-approved method that has a PQL no greater than the corresponding screening level.*

LANL Response

17. The Laboratory proposes that its current analytical methods are adequate to analyze 2,2'-oxybis(1-chloropropane); pentachlorophenol; phenol; acrolein; and acrylonitrile. Between 2006 and 2010, the Laboratory analyzed more than 2000 groundwater samples and more than 300 base-flow samples for these constituents. The results show few or no detections of these compounds.

    The MDL for 2,2'-oxybis(1-chloropropane) (2 µg/L) is less than the EPA tap water screening level.

    The MDL for pentachlorophenol (2 µg/L) exceeds the EPA MCL. The Laboratory uses SW-846:8270C, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze this constituent.

    The MDL for phenol (1 µg/L) is less than the New Mexico groundwater standard.

The MDLs for acrolein and acrylonitrile (1.3 µg/L and 1 µg/L, respectively) exceed the EPA tap water screening level. The Laboratory uses SW-846:8260B, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze these constituents.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS No	Analyte	Total Samples	Total Detects
Groundwater	108-60-1	Oxybis(1-chloropropane)[2,2'-]	2074	0
Groundwater	87-86-5	Pentachlorophenol	2074	1
Groundwater	108-95-2	Phenol	2074	5
Groundwater	107-02-8	Acrolein	2543	2
Base flow	107-13-1	Acrylonitrile	309	0
Groundwater	107-13-1	Acrylonitrile	2543	0

NMED Modification

18. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-19:

The Permittees propose to analyze 1,2-dibromo-3-chloropropane and 1,2-dibromoethane using EPA Method 8260 that has PQLs above the corresponding screening levels. The Permittees state that EPA Method 8011/504 can achieve PQLs that are below the corresponding screening levels but did not propose to use that method. Analyze 1,2-dibromo-3-chloropropane and 1,2-dibromoethane by EPA Method 8011/504 or another EPA-approved method (for example, EPA Method 504.1, 551.1 or 604) that has PQLs no greater than the corresponding screening levels.

LANL Response

18. The Laboratory proposes that its current analytical methods are adequate to analyze 1,2-dibromo-3-chloropropane and 1,2-dibromoethane. Between 2006 and 2010, the Laboratory has analyzed more than 2500 groundwater samples for these constituents. The results show no detections for these constituents.

The MDLs for 1,2-dibromo-3-chloropropane and 1,2-dibromoethane (0.3 µg/L and 0.25 µg/L, respectively) exceed the EPA MCL. The Laboratory uses SW-846:8260B, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze these constituents.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	CAS No	Analyte	Total Samples	Total Detects
Groundwater	96-12-8	Dibromo-3-chloropropane[1,2-]	2543	0
Groundwater	106-93-4	Dibromoethane[1,2-]	2543	0

NMED Modification

19. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-20:

1. *The Permittees propose to analyze methacrylonitrile using EPA Method 8260 that has a PQL above the corresponding screening level. EPA Method 524.2 can achieve a PQL for methacrylonitrile that is lower than Method 8260 and can meet the screening level. Analyze methacrylonitrile by Method 524.2 or another EPA-approved method that has a PQL no greater than the corresponding screening level.*

2. *The Permittees propose to analyze 1,2,3-trichloropropane using EPA Method 8260 that has a PQL approximately two orders of magnitude higher than the corresponding screening level. The Permittees state that EPA Method 504 can achieve a lower PQL for 1,2,3-trichloropropane than Method 8260. However, Method 504 does not provide the lowest available PQL for 1,2,3-trichloropropane and does not meet the corresponding screening level. Analyze 1,2,3-trichloropropane by SRL-524M-TCP (a modified, GS/MS-SIM version of EPA Method 524.2) or another industry-accepted method that has a PQL no greater than the corresponding screening level.*

LANL Response

19. The Laboratory proposes that its current analytical methods are adequate to analyze methacrylonitrile and 1,2,3-trichloropropane. Between 2006 and 2010, the Laboratory analyzed more than 2500 groundwater samples for these constituents. The results show no detections for these constituents.

    The MDL for methacrylonitrile (1 µg/L) is equal to the EPA tap water screening level.

    The MDL for 1,2,3-trichloropropane (0.3 µg/L) exceeds the EPA MCL. The Laboratory uses SW-846:8260B, a routine analytical method supported by the DOE-approved contract laboratory program, to analyze this constituent.

Number of Samples and Detections for Groundwater or Base-Flow Samples, 2006–2010

Media	Analyte	Analyte	Total Samples	Total Detects
Groundwater	126-98-7	Methacrylonitrile	2542	0
Groundwater	96-18-4	Trichloropropane[1,2,3-]	2543	0

PART II: COMMENTS

Resolve the following comments and concerns in future Plans, beginning in May 2011.

NMED Comment

1. *The Plan does not include Background, Monitoring Objectives, or Scope of Activities sections for any of the area-specific monitoring groups. In future Plans, provide these sections for each of the area-specific monitoring groups. Sampling locations that are not included in any of the area-specific monitoring groups may be combined into their own monitoring group, considered on a watershed-by-watershed basis, or some combination of both, but in any event must have their own Background, Monitoring Objectives, and Scope of Activities sections.*

LANL Response

1. The 2011 Interim Plan includes separate sections describing the background, monitoring objectives, and scope of activities for each area-specific monitoring group. Sampling locations not associated with project-specific monitoring groups are included in the general surveillance monitoring group. This group includes all base-flow locations, alluvial monitoring wells, and springs, except for those assigned to the TA-16 260 monitoring group. The general surveillance group also includes some wells completed in perched-intermediate zones or in the regional aquifer that are not associated with area-specific monitoring groups.

NMED Comment

2. *There are substantial differences in the scope of the Background sections between watersheds. All Background sections must describe the alluvial groundwater and perched intermediate and regional aquifers beneath each monitoring area, including occurrences of alluvial and perched intermediate saturation and the corresponding characteristics (if known) of each occurrence (e.g., location, depth, lateral extent, saturated thickness, flow direction). A general description of sources, type, distribution, and concentration of contaminants present in all aquifers beneath each monitoring area, and of surface water conditions (including springs) must be included. As an example, a description of surface water conditions for Pajarito Canyon should state that perennial flow is found: 1) in the upper reaches of Pajarito Canyon west of the Laboratory, 2) along a short 1.5 mile reach from Bulldog, Homestead, and Starmer springs to just upstream of the Twomile Canyon confluence; and 3) in the lower reach of the canyon near the Rio Grande, supported by contributions from Springs 4A and 4AA. The Permittees may reference other documents for more detailed information on the subjects addressed in the Background sections.*

LANL Response

2. Background sections for the various monitoring groups in the 2011 Interim Plan include general discussions of the alluvial groundwater and perched-intermediate and regional aquifers beneath each monitoring areas, including the occurrences of alluvial and perched-intermediate saturation. A general description of the contaminants in the aquifers beneath each monitoring area is also included, along with references to Laboratory reports that provide more detailed information.

NMED Comment

3. *Sampling locations that are being used or are candidates for the determination of background water quality for the regional and perched intermediate aquifers must be listed. The listing must include the corresponding analytical suites, sampling frequency, and whether or not the sampling frequency for a particular well deviates from the sampling frequency for the monitoring group to which the well belongs.*

LANL Response

3. Monitoring locations that are used for or are candidates to determine the background water quality for the regional and perched-intermediate aquifers are indicated as such in the sampling table for each monitoring group or watershed. Appendix D documents the rationale for those cases in which the sampling frequency for a background location deviates from the sampling frequency for the monitoring group to which the location belongs.

NMED Comment

4. *List all regional and perched intermediate well screens for which representativeness of water quality data is in question or has not yet been established (e.g., in newly constructed or rehabilitated wells). Include the rationale for each listed item, a description of actions to evaluate the well screens or correct deficiencies, and proposed analytical suites for the samples. Catalog all water sample quality problems that were identified in regional and perched intermediate well screens during the past 18 months (e.g., lack of stabilization of field parameters during well purging, incomplete equilibration after well installation or redevelopment, presence of chemical indicators of drilling products, unusual odors, colors or turbidity, anomalous data, and any other issue that might indicate impact on the quality of water samples). Well screens that are known not to produce representative samples and are no longer being evaluated for representativeness must also be included in the list.*

LANL Response

4. Appendix F of the 2011 Interim Plan establishes "watch lists" that identify deep monitoring wells for which the representativeness of water-quality data for certain constituents has issues or has not yet been established. Well screens known or suspected not to produce representative water-quality data and are no longer being evaluated for representativeness are also included in these lists if they are scheduled for water-quality sampling under the 2011 Interim Plan.

NMED Comment

5. *List all perched intermediate and regional well screens that are purged less than three casing volumes. Explain why they were not purged at least three casing volumes.*

LANL Response

5. Table F-2.0-1 in Appendix F of the Interim Plan lists deep well screens that5 cannot meet the 3–casing volume purge requirement and describes the reason for this condition. For completeness, Table F-2.0-2 lists the seven remaining wells in which a nonpurgeable Westbay sampling system was installed as of August 1, 2011.

NMED Comment

6. *Whenever symbols indicating semiannual (S), annual (A) or triennial (T) sampling frequencies are used, include superscripts/subscripts to specify the quarter(s) and year during which the sampling is scheduled to occur. For example, $S^{1,3}$ would indicate semiannual sampling in the first and third monitoring year quarters, and T^{2}_{13} would denote triennial sampling in the second monitoring quarter of the 2013 monitoring year.*

LANL Response

6. A summary table of the schedule providing details on the quarters during which sampling is scheduled to occur is presented in Table 1.8-1 of the 2011 Interim Plan. This summary table provides the same information that would be presented if the superscript/subscript method proposed by NMED is used.

NMED Comment

7. *When establishing groundwater screening levels, if there is no EPA MCL or NMWQCC standard for an analyte, use the most recent NMED tap water screening level. If there is no NMED tap water screening level, use the most recent EPA regional tap water screening level, adjusted to a cancer risk of 10^{-5}. This methodology has been proposed by the Permittees in the document entitled Corrective Measures Evaluation Report for Material Disposal Area G, Consolidated Unit 54-013(b)-99, at Technical Area 54, Revision 2 (LA-UR-10-7868), dated November 2010. NMED concurs with this procedure for all groundwater monitoring at LANL.*

LANL Response

7. The Consent Order prescribes a different process than described above for screening groundwater data, using EPA regional screening levels rather than NMED tap water screening levels. The Laboratory will follow the process prescribed in the Consent Order.

NMED Comment

8. ***Section 4.2, Background, third paragraph, page 16:***

   Make a clarification regarding the presence of alluvial groundwater in Mortandad Canyon. The Plan states that groundwater in Mortandad Canyon is present in alluvium. The presence of groundwater in the canyon bottom along the eastern extent of saturation in sediments of the Cerro Toledo Interval is not mentioned. This groundwater may be chemically different from that of the main alluvial aquifer, and may preferentially infiltrate towards the perched-intermediate and regional aquifers.

LANL Response

8. The presence of alluvial groundwater in Mortandad Canyon is discussed in more detail in section 3.2 of the 2011 Interim Plan, the background section for the chromium investigation monitoring group.

NMED Comment

9. ***Section 7.1, Chaquehui Canyon, first paragraph, second sentence, page 23:***

   Discharge from Spring 9 flows directly to the Rio Grande, not Chaquehui Canyon. DOE Spring and Spring 9A contribute flow to Chaquehui Canyon.

LANL Response

9. The Laboratory concurs with NMED’s comment.

NMED Comment

10. ***Figure 2.4-1, pages 35:***

    Mark the location of Campsite Spring on the map.

LANL Response

10. Campsite Spring is shown in Figure 4.4-1 of the 2011 Interim Plan.

NMED Comment

11. Table 5.4-1, page 88:

3. Groundwater discharge from Homestead Spring is not significant compared to that of nearby Starmer or Bulldog Springs.

4. The classification of PC Spring as a background water quality location for the regional aquifer is inconsistent with the Groundwater Background Investigation Report, Revision 4 (EP2010-0308), where PC Spring is listed as a background water quality location for the intermediate aquifer.

LANL Response

11. 3. The text in Table 5.4-1 has been revised to remove the statement that Homestead Spring has significant discharge rates.

4. The text in table has also been revised to state PC Spring provides background water-quality data for the intermediate aquifer.

NMED Comment

12. Table 5.4-1, page 91:

The source aquifer for canyon-bottom wells CDBO-6 and CDBO-7 is Bandelier Tuff, not alluvium.

LANL Response

12. Monitoring wells CDBO-6 and CDBO-7 are in shallow bedrock, and the observed water is likely from infiltration of runoff through the canyon floor.

NMED Comment

13. Table 6.4-1, pages 97 and 98:

It is still uncertain whether or not regional wells R-26 screen 1, CdV-R-15-3 and CdV-R-37-2 can be converted to non-Westbay wells. The conversion of these wells will be based on results of the ongoing reliability assessment.

LANL Response

13. Table 6.4-1 has been revised to state that R-26 screen 1 has been converted to single-screen well. The final conversion of wells CdV-R-15-3 and CdV-R-37-2 will be based on the results of the ongoing reliability assessment.

NMED Comment

14. Table 7.4-1, pages 112 and 113:

5. Sacred Spring, Sandia Spring, and Springs 1 and 2 should be intermediate aquifer monitoring locations because they exhibit temperatures that are indicative of intermediate groundwater beneath the Pajarito Plateau.

6. La Mesita Spring and Springs 7 and 8 discharge on the east side of the Rio Grande and are likely recharged from the eastern portion of the Española Basin.

LANL Response

14. 5. Temperature data are not sufficient to determine the origin of water in these springs. The water chemistry for the springs shows a similarity to other regional aquifer water.

6. Because discharge from La Mesita Spring and Springs 7 and 8 likely originates from the eastern portion of the Española Basin, they do not serve as boundary monitoring points for evaluating the Laboratory's impact on the regional aquifer and the Rio Grande. The Laboratory proposes to cease monitoring Springs 7 and 8 under the 2011 Interim Plan; La Mesita Spring, located on San Ildefonso land, will continue to be monitored as agreed upon under the monitoring plan in Appendix A to the memorandum of understanding between DOE, the Bureau of Indian Affairs, and the Laboratory (dated 1996 and updated March 30, 2011).

NMED Comment

15. Appendix B, B-3.0 Protocol For Screening Nonstorm-Related Surface Water Data, sixth paragraph, page B-5:

Calculate watershed-specific or watershed-segment-specific hardness-dependent acute and chronic aquatic life criteria for base flows for all metals listed in and in accordance with 20.6.4.900.I NMAC. The calculations must be based on geometric means of hardness data collected during the previous four years. If four years of hardness data are not available, utilize validated hardness data collected over a shorter period of time, highlighting each use of a shorter collection period.

LANL Response

15. Base-flow data were screened using location-specific hardness-dependent acute and chronic aquatic life criteria for all metals listed in and in accordance with 20.6.4.900.I New Mexico Administrative Code (NMAC). Values from Table I-3 of 20.6.4.900.I NMAC were used for this purpose. The selection of the criteria was based the geometric mean of available hardness values for a location; hardness values are tabulated in Table B-3.0-1 of Appendix B.

NMED Comment

16. Appendix B, Tables B-2 and B-4:

The abbreviations for Standard Source in Tables B-2 and B-4 (HHPersU and HHPersF) are inconsistent with corresponding abbreviations in Tables 1.6-1 and B-1.0-1 (HHPU and HHPF).

LANL Response

16. The table has been revised to ensure the abbreviations are used consistently.

NMED Comment

17. Appendix B, Table B-4:

The Table classifies the sampling locations Pajarito 0.5 mi above SR-501, Pajarito below confluences of South and North Anchor East Basin, and Pajarito at Rio Grande as ephemeral. Prior documentation by the Permittees (Figure A-1 from the document entitled "Work Plan for Pajarito Canyon" dated 1998, LAUR-98-2550) depicts the three locations as being located along a perennial surface-water reach, which comports with current knowledge.

LANL Response

17. The designations in Table B-4 in the 2010 Interim Plan were incorrect and have been corrected in Table B-3.0-1 of the 2011 Interim Plan.

NMED Comment

18. Appendix C, C-2.0 Summary of Field Investigation Methods, page C-3:

List stabilization criteria for field parameters measured during well purging.

LANL Response

18. Stabilization criteria are listed for field parameters are listed in Appendix C of the 2011 Interim Plan.

NMED Comment

19. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories:

For the naturally-occurring General Inorganic Analytes, Metals and Radionuclides that have numerical background values, use the background values as screening levels. If an area-specific monitoring group has its own background values, screening levels for that monitoring group must be based on those background values. If an analyte has multiple numerical backgrounds (for example, different backgrounds in different aquifer zones), then the lowest applicable numerical background must be used as a screening level for that analyte. If a naturally-occurring analyte listed under the General Inorganic Analytes, Metals or Radionuclides does not have a numerical background value, then the lowest PQL achievable by the most recent EPA or industry-accepted extraction and analytical method for that analyte must be used as a screening level. For hexavalent chromium, use the screening level established for total chromium. For each analyte with a screening level based on a numerical background, specify an analytical method that has PQL no greater than the corresponding screening level. If there is no EPA or industry-accepted analytical method that can achieve the required PQL, then specify the EPA or industry-accepted analytical method that has the lowest achievable PQL.

LANL Response

19. Background values were used as screening levels (Appendix B). No area-specific monitoring group background values are available. Groundwater samples were screened to backgrounds for the pertinent groundwater zone. No PQLs were used for screening. Any detected results are reported either as a value above the PQL or, for estimated results, as a value between the PQL and the MDL.

    Water analyses provided to the Laboratory by contract analytical laboratories are EPA or industry-accepted. Hexavalent chromium data were screened against the screening level established for total chromium. For analytes with background values, the lowest possible background is based on the MDL for the data used to determine background. The PQL values are generally 3 to 5 times larger than the MDL values. The Laboratory has provided the PQLs in the tables in Appendix C.

NMED Comment

20. Appendix C, C-4.1 Analyses by Accredited Contract Laboratories, page C-14:

7. The Permittees list 15 pCi/L as the EPA MCL for gross alpha. The numerical standard of 15 pCi/L is the EPA MCL for adjusted gross alpha, which excludes alpha particle activity from radon and uranium.

8. The Permittees list 8 pCi/L and 20,000 pCi/L as the EPA MCLs for strontium-90 and tritium. These are not EPA MCLs but average annual concentrations assumed to produce a dose of 4 mrem/year (the EPA MCL for beta particle and photon radioactivity). If two or more radionuclides are present, the sum of their annual dose from beta particle and photon radioactivity must not exceed the MCL of 4 mrem/year.

LANL Response

20. Gross alpha is compared with the 15 pCi/L EPA MCL as an initial screening step. These samples are not used to determine compliance with drinking water standards..

    The EPA MCL for beta and photon radioactivity is 4 mrem/year. The EPA radionuclide rule lists 8 pCi/L and 20,000 pCi/L for strontium-90 and tritium, respectively, as reference values for evaluating compliance with the MCL (Table A—Average Annual Concentrations Assumed To Produce: A Total Body or Organ Dose of 4 mrem/yr). These samples are not used to determine compliance with drinking water standards outlined in 40 Code of Federal Regulations (CFR) Parts 9, 141, and 142 National Primary Drinking Water Regulations; Radionuclides; Final Rule 40 CFR Parts 9, 141, and 142 National Primary Drinking Water Regulations; Radionuclides; Final Rule Federal Register/Vol. 65, No. 236/Thursday, December 7, 2000/Rules and Regulations.

NMED Comment

21. Appendix C, C-4.2 Analyses by On-Site Laboratories, pages C-21-22:

For each analyte listed under General Organics and Metals, provide information on the PQL and the relevant screening level. Each analyte with a PQL above the corresponding screening level must be highlighted in the table, and an explanation for each occurrence provided. For the naturally-occurring General Inorganics and Metals that have numerical background values, use the background values as screening levels. If an area-specific monitoring group has its own background values, screening levels for that monitoring group *must be based on those background values. If an analyte has multiple numerical backgrounds (for example, different backgrounds in different aquifer zones), the lowest applicable numerical background must be used as a screening level. If a naturally-occurring analyte listed under the General Inorganics or Metals does not have a numerical background value, then the lowest PQL achievable by the most recent EPA or industry-accepted extraction and analytical method must be used as a screening level. For hexavalent chromium, use the screening level established for total chromium. For each analyte with a screening level based on a numerical background, specify an analytical method that has a PQL no greater than the corresponding screening level. If there is no EPA or industry-accepted analytical method that can achieve the required PQL, use the EPA or industry-accepted analytical method that has the lowest achievable PQL.*

LANL Response

21. Results of analyses provided by on-site laboratories are used for screening purposes and are voluntarily provided to NMED. These data are not used to address regulatory requirements.

NMED Comment

22. Appendix C:

Add a section on analytical methods for base-flow samples for analytes listed in Table B-2. The section must have contents and format similar to Section C.4.0 Analytical Methods – Groundwater Analytical Suites, and must cover analyses performed by both contract laboratories and on-site laboratories.

LANL Response

22. This information is provided in Appendix C for contract laboratories; regarding on-site laboratories, see response to Comment 21.

NMED Comment

23. Appendix D, Tables D-1.0-3, D-2.0-1 and D-4.0-1:

Superscripts in column headings and table entries are not defined in the table footnotes.

LANL Response

23. Superscripts in column headings and table entries are defined in the table notes in the 2011 Interim Plan.

REFERENCES

Jacobs, E., June 21, 2011. "Recommendation Regarding Replacing Alluvial Well SCA-1," Los Alamos National Laboratory memorandum to T. Goering (ET-EI) from E. Jacobs (EES-17), Los Alamos, New Mexico. (Jacobs 2011, 204587)

Purtymun, W.D., A.K. Stoker, S.G. McLin, M.N. Maes, and T.A. Glasco, 1995. "Water Supply at Los Alamos During 1993," Los Alamos National Laboratory report LA-12951-PR, Los Alamos, New Mexico. (Purtymun et al. 1995, 092522)