



July 6, 2022

Arturo Duran
U.S. Department of Energy
Environmental Management
Los Alamos Field Office
1200 Trinity Drive, Suite 400
Los Alamos NM 87544

**Re: APPROVAL SUBMITTAL OF THE SUPPLEMENTAL INVESTIGATION REPORT FOR SITES AT
TECHNICAL AREA 49 INSIDE THE NUCLEAR SITE BOUNDARY, REVISION 1
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-16-037**

Dear Mr. Duran,

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the United States Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) *Submittal of the Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Site Boundary, Revision 1* (Revision) dated and received May 24, 2022 (referenced by EM2022-0110).

Background:

The TA-49 Inside the NES Boundary includes the following units: Solid Waste Management Unit (SWMU) 49-001(a), SWMU 49-001(b), SWMU 49-001(c), SWMU 49-001(d), SWMU 49-001(e), SWMU 49-001(f), SWMU 49-001(g) SWMU 49-003, Area of Concern (AOC) 49-008(c), AOC 49008(d). These sites were originally investigated in 2009-2010, as part of the Phase I Investigations. Following Force Majeure events and the revision of the Order on Consent, NMED granted DOE's extension requests to submit the Supplemental Investigation Report from in 2016 instead of 2012.

This Revision replaces *Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Site Boundary* (SIR) dated and received August 9, 2016 (referenced by EP2016-0062/LA-UR-16-25263). NMED provided draft comments on the SIR on January 6, 2022, April 7, 2022, and May 10, 2022, and the DOE provided responses. NMED comments and DOE responses are attached with this letter.

NMED has reviewed the DOE responses and the Revision and find that NMED's draft comments have been adequately addressed. The hazard index (HI) for SWMU 49-001(e) was calculated at 2.0 which is greater than the NMED target HI of 1.0, and the total excess cancer risk was calculated at 2.0E-5 which is

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above the NMED target risk level of 1.0E-5, Doe must address the excess risk.

NMED hereby approves the Revision, and concurs that additional evaluation and investigations are warranted for five (5) sites: SWMU 49-001(a), SWMU 49-001(b), SWMU 49-001(c), SWMU 49-001(d), and SWMU 49-001(f). SWMU 49-001(a), SWMU 49-001(b), SWMU 49-001(c), SWMU 49-001(d), SWMU 49-001(e), SWMU 49-001(f) were areas consisting of experimental shafts ranging in depths from 31 to 142 feet below ground surface (bgs) and the extent of contamination has not been defined for these areas. The risk has not been evaluated for these units. The DOE must conduct a Corrective Measures Evaluation for SWMU 49-001(a), SWMU 49-001(b), SWMU 49-001(c), SWMU 49-001(d), and SWMU 49-001(f).

The nature and extent are defined for SWMU 49-001(g), however, the DOE must re-evaluate the risk since the risk for this site was previously evaluated along with SWMU 49-001(b), SWMU 49-001(c), and SWMU 49-001(d), all of these sites require additional corrective measures.

The DOE must propose controls for SWMU 49-001(e) since it poses potentially unacceptable risk under the residential land use scenario, or propose a remedial action (e.g., the removal of contaminants driving risks).

The nature and extent have also been defined for SWMU 49-003, AOC 49-008(c), and AOC 49-008(d). The risk evaluation indicates that SWMU 49-003, AOC 49-008(c), and 49-008(d) do not pose an unacceptable risk to human health under the residential, construction, and industrial land use scenarios, and do not pose an unacceptable ecological risk.

Please contact Siona Briley of my staff, at (505) 690-5160, should you have any questions or concerns.

Sincerely,

Rick Shean

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Rick Shean
Date: 2022.07.06
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Rick Shean
Chief
Hazardous Waste Bureau

Attachment: NMED Draft Comments and DOE Responses

Cc w/ Attachment:

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File: 2022 LANL, TA-49, Approval of SIR for Sites at TA-49 Inside the Nuclear Environmental Site (NES)
Boundary, Revision 1
LANL-16-037

**Response to the Draft New Mexico Environment Department Comments for the
Supplemental Investigation Report for Sites at Technical Area 49 Inside the
Nuclear Environmental Site Boundary,
Dated January 6, 2022**

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim (in italics). The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment.

GENERAL COMMENTS

Nature and Extent of Contamination

NMED Comment

- 1. In Section 5.2, the Permittees state that the comparisons of sample results to soil screening levels/screening action levels (SSLs/SALs) are used in determining whether the extent of contamination has been defined. According to the text, the comparisons are performed after determining whether the extent is defined by decreasing concentrations vertically and laterally and that sample concentrations are below estimated quantitation limits (EQLs) or detection limits (DLs). It is agreed that no further sampling for extent is warranted if the applicable SSL/SAL is significantly greater (orders of magnitude) than the maximum chemical of potential concern (COPC) concentration; in these cases, the comparison to the SSL/SAL may be used as a single line of evidence. However, if concentrations increase with depth and/or distance but do not display any obvious trends, and within 10% or slightly above 10% of the SSL/SAL, additional lines of evidence are required. This includes comparisons to the background values if an inorganic.*

Other lines of evidence are required to be addressed in the report and may include:

- A sufficient number of samples have been collected to determine nature and extent, but results are predominately non-detect (discussion of sample number versus detections).*
- There is no history to suggest the constituent is directly related to site activities or a dominant waste stream. If there is site history to suspect that the constituent is present due to site activities (such as lead at a firing site), then it is possible that the constituent could be present from historical activities at low levels (in the high range of background). In these cases, the constituent still must be carried forward as a constituent of potential concern (COPC) and retained in the risk assessment (it will likely not be a risk driver) or if it is not retained as a COPC, risks associated with it must be presented in the uncertainty section.*
- Spatial analyses do not show a pattern or trend indicating contamination.*

DOE Response

1. As described in section 5.2, of the "Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary" (LANL 2016, 601699), the determination of whether

extent of contamination is defined is based on spatial concentration trends (e.g., concentrations decreasing with depth or laterally). The comparison with soil screening levels (SSLs)/screening action levels (SALs) is not used to determine whether extent is defined. Rather, if extent is not defined, comparison with SSLs/SALs is used as a line of evidence to determine whether additional sampling to define extent is warranted. In general, if the maximum concentration is sufficiently less than the SSL/SAL (e.g., less than 10%), additional lines of evidence may not be needed. Otherwise, additional lines of evidence are used to determine whether additional sampling is warranted. Note that evaluation of site history used as a line of evidence to determine whether a detected constituent is a chemical of potential concern (COPC) rather than whether extent is defined or additional sampling is warranted.

The report sections evaluating nature and extent of contamination will be reviewed and revised as appropriate based on the criteria in NMED's comment.

NMED Comment

- 2. In Section 6.0, the discussion provided by the Permittees for each solid waste management unit (SWMU) or area of concern (AOC), does not demonstrate that the nature and extent have been defined by decreasing patterns of contamination away from the likely source of contamination or other applicable lines of evidence as described in Section 4.9 of the 2019 NMED Soil Screening Guidance (SSG). In some cases where the contamination levels are increasing or not changing, the Permittees use other factors (such as relation to SSLs for background values (BVs)) to determine that the extent has been defined. This approach is not consistent with the 2019 NMED Guidance; and is potentially misleading for determining maximum values, since the extent may not be defined due to potential data gaps. Revise discussions of nature and extent presented in Section 6.0 to present a comprehensive characterization of COPC concentration trends at each site and provide justification for the comparison of sample values to SSLs or BVs in lieu of decreasing trends.*

While it is acknowledged that the maximum background value can be used for comparisons in special cases (e.g., statistically determined BV is significantly greater than the maximum background concentration), in accordance with the agreements made during the 2/14/17 meeting, comparison to the maximum background concentration must be used in conjunction with additional lines of evidence to include:

- Statistically determined BV is significantly greater than the maximum background concentration.*
- Statistical tests cannot be performed because of insufficient data or a high percentage of non-detections.*
- A sufficient number of samples have been collected to determine nature and extent, but results are predominately non-detect (discussion of sample number versus detections).*
- There is no history to suggest the constituent is directly related to site activities or a dominant waste stream. If there is site history to suspect that the constituent is present due to site activities (such as lead at a firing site), then it is possible that the constituent could be present from historical activities at low levels (in the high range of background). In these cases, the constituent still must be carried forward as a COPC and retained in the risk assessment (it will likely not be a risk driver) or if it is not retained as a COPC, risks associated with it must be presented in the uncertainty section.*
- Spatial analyses do not show a pattern or trend indicating contamination.*

- *The site concentration is significantly lower than the corresponding soil screening level (SSL).*
- *The maximum detected result is statistically determined to be an outlier (note, sufficient samples must be collected to show a point is an outlier and not indicative of a hotspot).*

The Permittees' approach is not consistent with the 2019 NMED SSG; and is potentially misleading for determining maximum values, since the extent may not be defined due to potential data gaps. The Permittees must revise discussions of nature and extent presented in Section 6.0 to present a comprehensive characterization of COPC concentration trends at each site (also see discussion 2.b below) and justify the comparison of sample values to soil screening levels or BVs in lieu of decreasing trends.

DOE Response

2. As noted in comment 1, section 5.2 of the report describes the process used to determine whether extent is defined or additional sampling is warranted. This process does not include comparison with maximum background concentrations. As described in section 5.1.1 of the report, comparison with maximum concentrations in the background data set may be used as a line of evidence to determine whether a detected constituent is a COPC. In accordance with the process described in section 5.1.1, the primary criterion for determining whether an inorganic constituent is a COPC is the result of statistical comparisons between site data and background data. Other lines of evidence are used only if statistical tests cannot be performed.

Comments similar to comment 2 concerning comparison with maximum background concentrations were received for other supplemental investigation reports (SIRs). Those SIRs were revised based on NMED-approved comment responses. Section 5.1.1 of this report will be revised for consistency with the text in these approved SIRs, including replacing comparison with maximum background concentrations with comparison with the upper end of the background data set. The text in section 6 describing identification of COPCs will be reviewed and if site data are compared with the upper end of the background data set, one or more of the criteria will be cited in the report as a basis for this comparison (e.g., less than eight soil samples were collected, so statistical tests could not be performed). The text regarding identification of certain inorganic COPCs will be revised as appropriate to clarify or provide additional lines of evidence in support of eliminating some inorganic chemicals as COPCs.

Note that the process described in section 5.1.1 is the process developed in 2012 for reevaluating data in investigation reports. This process was used when the SIR was written in 2016 and is consistent with other SIRs prepared at that time and approved by NMED. This process may not be consistent with NMED's 2019 soil screening guidance (SSG) (NMED 2019, 700550), but the 2019 SSG is not relevant to a document prepared in 2016.

NMED Comment

3. *In Section 6.0 the Permittees provide numeric comparisons to the site concentrations and background value (BV) or soil screening level (e.g., the screening level is 25 times greater than the detected COPC concentration) without citing the purpose of this comparison. Revise the text to present site concentrations to NMED target levels (i.e., soil screening levels, lifetime cancer risk, and hazard index value (HI)) along with primary lines of evidence (e.g., concentration trends, and potential data gaps) used by the Permittee to determine if the nature and extent are defined for that COPC.*

Additionally, a summary of the human health and ecological risk screening assessments for each SWMU and Area of Concern (AOC) addressed is provided in Section 6.0 of the Inside SIR. However, the location of information that supports the reported results is never referenced in these summaries. Revise the summaries of human health and ecological risk screening in Sections 6.0 to include references to the appropriate sections, subsections, and/or tables of Appendix I for additional information regarding how the reported cancer risks, hazard quotients (HQs), and hazard indices (HIs) were determined.

DOE Response

3. As noted in the response to comment 1, the purpose of comparing site concentrations with SSLs is described in section 5.2, i.e., to determine if additional sampling to define extent is warranted. The report will be revised to provide a reference to section 5.2 in the introduction to each subsection in section 6 where extent of contamination is evaluated.

The text in the report summarizing the conclusions of the human health and ecological risk assessments is consistent with other SIRs previously approved by NMED. No revision to the report is needed, but the comment will be considered when preparing future investigation reports.

NMED Comment

4. *A summary of the human health and ecological risk screening assessments for each SWMU and AOC is addressed in Sections 6.0-7.0. However, the location of information that supports the reported results is never referenced in these summaries. Revise the summaries of human health and ecological risk screening in Sections 6.0 through 7.0 to include references to the appropriate sections, subsections, and/or tables of Appendix I for additional information regarding how the reported cancer risks, hazard quotients (HQs), and hazard indices (HIs) were determined.*

NMED notes the dose value listed for cesium 137 at AOC 49-008(c) in Table I-4.2-28, and the dose values in Tables I-4.2-31 and I-4.2-34 were calculated correctly, and that all other radioactive dose values were calculated incorrectly. The Permittees must revise the calculated values, hazard indexes, as well as any discussions applicable to the SWMU/AOC's specific human health and ecological risk values.

DOE Response

4. The text in the report summarizing the conclusions of the human health and ecological risk assessments is consistent with other SIRs previously approved by NMED. No revision to the report is needed, but the comment will be considered when preparing future investigation reports.

DOE notes that the dose results presented in Tables I-4.2-31 and I-4.2-34 for AOC 49-008(c) are correct, but that dose results presented in all other radionuclide screening tables are incorrect. The latter tables present the ratio of the exposure point concentration to the SAL but have not been multiplied to 25 to convert the ratio to dose. The radionuclide screening tables will be corrected and the references to dose in the report text and Appendix I will also be corrected. The corrected total doses will all be less than 25 mrem/yr and the conclusion that no sites pose an unacceptable dose under any exposure scenario will remain.

NMED Comment

5. NMED notes that in Volume II of the NMED 2019 Guidance document, there exists a tiered approach for performing screening level ecological risk assessments (SLERA) in the state of New Mexico. Section 4.0, Tier 2 SLERA, Volume II of the 2019 NMED Guidance offers refinements to the initial screening calculations through the application of bio-uptake and bioaccumulation modeling to predict contaminant of potential ecological concern (COPEC) concentrations in plants and animal/invertebrate matter and plant uptake factors to predict COPEC plant concentrations. It is unclear whether the Permittees considered these factors in the screening level ecological risk assessment performed for the ten sites addressed in this SIR. Revise Section 4.2 to clarify whether these factors were used; and if they were not, revise all applicable sections, attachments, and tables to include these refinements into subsequent ecological risk analyses in lieu of qualitative lines of evidence used by the Permittees but not recognized as valid by NMED (e.g., comparison of exposure point concentrations to the maximum background concentration).

DOE Response

5. The comment references NMED's soil screening guidance for ecological risk assessments document published in 2017 (NMED 2017, 602274), which is after the ecological risk assessment was completed in 2016. LANL has created its own ecological screening methods with the first version in 1998 (Kelly et al. 1998, 057916) and the latest version in 2018 (LANL 2018, 602965). NMED has approved the LANL screening level ecological risk assessment (SLERA) method and was integrally involved in the development of the original 1998 LANL SLERA approach. The LANL SLERA method includes bioaccumulation into the calculations of the chemical and radionuclide ecological screening levels (ESLs). The general equations are in the LANL SLERA document Revision 4 (LANL 2015, 600982) and the factors used are in the ECORISK database (LANL 2015, 600921). Both of these have been approved by NMED (NMED 2016, 601533; NMED 2016, 601696).

NMED Comment

6. The sites at Technical Area 49 (TA-49) Inside the Nuclear Site Boundary are potentially impacted by volatile organic compounds. The sites were evaluated based on data collected in 2009-2010. Concerns have been raised in the past about volatile organic compound (VOC) collection methods at LANL. In the September 30, 2011 Notice of Disapproval of the Phase II Investigation Work Plan, Three Mile Canyon Aggregate Area, NMED required the Permittees to describe in detail the methods that will be used to collect the samples for VOC analysis. The purpose of the requirement is to ensure that the loss of VOCs during sample collection is minimized. In their October 2011 response, the Permittees stated that standard operating procedures (SOPs) were being revised to address the potential loss of VOCs during sampling. It was further stated that after the SOPs were revised, a work plan addendum would be submitted to NMED for review and approval before the Phase II investigation work plan was implemented.

Because the same methods used in the Threemile Canyon Aggregate Area investigation were used to investigate TA-49 Inside the Nuclear Site Boundary, the Permittees must evaluate the validity of VOC sample data presented in the Report and determine if collection of additional samples is required.

DOE Response

6. The text in Appendix B, section B-5.4 will be revised to indicate samples for volatile organic compound (VOC) analysis were transferred to sample containers immediately after collection to minimize the loss of VOCs during the sample-collection process. This procedure is consistent with collection of samples for VOC analysis in other investigation reports approved by NMED after 2011.

For sites at Technical Area 49 inside the nuclear environmental site boundary having the potential for VOC contamination, pore-gas data were used to supplement VOC soil data. Solid Waste Management Units (SWMUs) 49-001(a-f) consist of experimental shafts used to conduct tests with explosives and radioactive materials, with no known use of VOCs. SWMU 49-001(g) consists of surface contamination due to a release from one of the shafts and likewise has no known use of VOCs. SWMU 49-003 is an inactive leach field and drainlines that served radiochemistry laboratories and could potentially have received minor quantities of laboratory solvents. Area of Concern (AOC) 49-008(c) consists of potential soil contamination associated with former radiochemistry facilities and potentially could also have received minor quantities of laboratory solvents. AOC 49-008(d) is a facility used to conduct experiments involving explosive confinement tests and has no known use of VOCs. Because some of the sites within the nuclear environmental site boundary could have VOC contamination, pore-gas sampling within boreholes was conducted at all of the sites. The results of the soil and pore-gas samples are consistent, with very low levels of VOCs being detected in each, indicating low potential for VOC contamination and no need for additional VOC sampling or continued pore-gas monitoring.

SPECIFIC COMMENTS

NMED Comment

7. **Section 5.1.1 Identification of COPCs, pages 16-17**

The Permittees list lines of evidence to be used in determining if an inorganic chemical should be eliminated as a COPC. The first item listed is in comparison to the maximum background concentration. This line of evidence is also presented in the second bulleted item in Section 5.2. NMED does not consider such comparisons as a valid line of evidence for dismissing detected inorganic compounds as COPCs. The range of values in the background data set is considered in the statistical determination of appropriate background threshold values (e.g., BVs). As indicated in Section 2.7.3 of NMED's 2019 SSG, if the maximum concentration of a COPC exceeds the applicable BV, statistical tests should be used to determine if the data set for the COPC is statistically different from the applicable background data set. While it is acknowledged that the maximum background value can be used for comparisons in special cases (e.g., statistically determined BV is significantly greater than the maximum background concentration), Section 5.1.1 (and the SIR in its entirety) should be revised to eliminate comparisons of COPC concentrations to the maximum value in the applicable background data set as a line of evidence for eliminating a detected inorganic compound as a COPC unless conditions exist that preclude the comparison of COPC data to the statistically derived BV.

The Permittees state "some radionuclides may be present as a result of fallout from historical nuclear weapons testing and these radionuclides are also not considered COPCs". Permittees must provide a justification and or references for this determination (e.g., in accordance with the Atomic Energy Act of 1955 or the 2016 Consent Order).

DOE Response

7. As noted in the response to general comment 2, similar comments concerning comparisons with maximum background concentrations during COPC identification were received for previous SIRs. The text in section 5.1.1 of these SIRs was revised in accordance with NMED-approved comment responses and the revised SIRs were approved by NMED. Section 5.1.1 of this report will be revised for consistency with the text in these approved SIRs, including replacing comparison with maximum background concentrations with comparison with the upper end of the background data set. The text in section 6 describing identification of COPCs will be reviewed and if site data are compared with the upper end of the background data set, one or more of the criteria will be cited in the report as a basis for this comparison (e.g., less than eight soil samples were collected, so statistical tests could not be performed). The text regarding identification of certain inorganic COPCs will be revised as appropriate to clarify or provide additional lines of evidence in support of eliminating some inorganic chemicals as COPCs.

Fallout radionuclides are those anthropogenic radionuclides present in soil or sediment as a result of historical open-air testing of nuclear weapons and are not a result of releases from Laboratory activities (LANL 1998, 059730). For anthropogenic radionuclides, fallout values derived from sources unrelated to facility activities are considered baseline levels (NMED 1988, 057761).

NMED Comment

8. Section 6.2.4.3, Soil, Rock and Sediment Sampling Analytical Results, page 28:

The Permittees indicated that cyanide was not detected above the maximum BV (0.5 mg/kg), but acknowledged that the detection limit range (0.51mg/kg to 0.54 mg/kg) for cyanide was (0.01mg/kg to 0.04 mg/kg) greater than the maximum BV proposed for a COPC threshold. It appears that 11 samples exceeded the maximum BV for cyanide; but were also listed as 'non-detects' since those samples were less than the detection limit. If the analytical method used by the Permittees is not able to detect samples at or below the proposed maximum BV, the Permittees must propose either another analytical method with a lower detection limit, eliminate the use of threshold maximum BV (See General Comment above), or retain cyanide as a COPC since a reliable value cannot be determined from the current analytical method.

The Permittees indicated that mercury was not detected above the maximum BV (0.1 mg/kg), but acknowledged that the detection limit was (0.11mg/kg) for mercury was (0.01mg/kg) greater than the maximum BV. It appears that 80 samples exceeded the maximum BV for mercury, but also were listed as 'non-detects' since those samples were less than the detection limit. If the analytical method used by the Permittees is not able to detect samples at or below the proposed maximum BV, the Permittees must propose either another analytical method with a lower detection limit, eliminate the use of threshold maximum BV (See General Comment above), or retain mercury as a COPC since a reliable value cannot be determined from the current analytical method.

The Permittees indicated that lead was not considered a COPC since the quantile and slippage test indicated that the concentrations of lead in the soil are not statistically different from the background, despite the Gehan test indicating that lead concentrations were statistically different from the background. NMED notes that in the event of conflicting statistical results, the most conservative approach would be to include lead as a COPC. If the Permittees do not intend to include lead as a COPC this section must be revised to provide a discussion to justify lead's exclusion.

DOE Response

8. The text will be revised to provide additional lines of evidence (e.g., absence of history of site activities using cyanide) for eliminating cyanide as a COPC.

The statement "Mercury was not detected or detected below BVs in the other 122 samples (detected below BVs in 80 samples)" means that 122 of the 126 samples analyzed for mercury had detection limits below the background value (BV). Of the remaining 4 samples, 1 had mercury detected at 0.003 mg/kg above BV and 3 had detection limits 0.01 mg/kg above BV. These concentrations are equivalent to BV. Because of the low magnitude and frequency of detections or detection limits above BV, mercury should not be retained as a COPC. No revision to the text is necessary.

As described in section 5.1.2, three statistical tests are used, if appropriate, based on the percentage of detections. The text in section 5.1.2 will be revised to clarify that a constituent must pass two statistical tests in order to be eliminated as a COPC. Presentation of the results of the Gehan test for lead in section 6.2.4.3 is confusing since only the quantile and slippage results are necessary to eliminate lead as a COPC. The text in section 6.2.4.3 will be revised to delete discussion of the Gehan test for lead.

NMED Comment

9. Section 6.2.4.4, Nature and Extent of Contamination, page 32:

The Permittees state that a sufficient VOC samples were not collected to evaluate the lateral extent of methylene chloride at SWMU 49-001(a). While it is true that the Permittees have met their obligation for sampling agreed upon in the NMED approved work plan by only sampling perimeter boreholes for VOCs. NMED notes that this work plan was intended to be the first phase in a two-phase (phase-I and phase-II) investigation, with the intent that data gaps discovered from the initial phase (phase-I) of this investigation would be corrected in a later phase of the investigation. The presence of methylene chloride (which can only be attributed to anthropogenic activities) was unexpected based on the background information provided by the Permittees for this site and should warrant additional investigation, with an emphasis on defining the lateral extent of methylene chloride, and other VOCs not defined due to issues with sampling methodology (See General Comment F above).

Additionally, the Permittees' justification that additional sampling of methylene chloride is not warranted because the residential SSL is approximately 124,000 times the maximum concentration, is not sufficiently justified since the lateral extent of this contaminate has not been defined and the Permittees have not provided additional lines of evidence to support this position. The Permittees must propose additional borehole sampling to define the lateral extent or provide additional lines of evidence for NMED's approval to support their position that additional sampling is not necessary.

DOE Response

9. The sampling approach for VOCs described in the investigation work plan (LANL 2008, 102691) was intended to determine the potential for off-site releases of VOCs at levels that would require additional characterization. Thus, samples were collected only at perimeter locations. As noted in section 8.3, additional corrective actions within the boundary of SWMU 49-001(a) will be identified as part of the corrective measures evaluation process. Section 6.2.4.4 will be revised to clarify the investigation approach and the justification for not recommending additional sampling for lateral extent.

NMED Comment

10. Section 6.2.6, Summary of Ecological Risk Screening, page 33:

The Permittees state that no potential ecological risks to the earthworm, plant, American robin, deer mouse, and montane shrew exist at SWMU 49-002, this statement is inconsistent with the hazard index's (HIs) presented in Sections I-5.3.1, I-5.4.5.1, and Table I-5.4-2, which were all calculated to be greater than 1 HI. For instance, in Section I-5.4.5 the Permittees report that the adjusted HI for the robin (omnivore/insectivore diet scenario) was 2 and 3 respectively; 3 for the shrew, and 7 for the deer mouse. The unadjusted HI was reported to be 3 for the earthworm, and 2 for the plant. Revise the statement to clarify that the adjusted and unadjusted HIs were greater than 1, but less than 1 for the aforementioned biota under the lowest-observed-adverse-effect level (LOAEL)-based environmental screening levels (ESLs) as described in Attachment I, Section I-5.4.7.1 and Table I-5.4-9.

DOE Response

10. The summary of ecological risk screening presented in the text in section 6.2.6 is based on the interpretation of ecological risk screening results presented in Appendix I, section I-5.5. This section of the report is intended to present the overall conclusions of the ecological risk screening results, not to provide details concerning how those conclusions were reached. The latter are presented in the site-specific discussions in Appendix I. This approach is consistent with previous investigation reports and SIRs approved by NMED. No revision to the report is necessary.

NMED Comment

11. Section 6.3.6, Summary of Ecological Risk Screening, page 43:

The Permittees state that no potential ecological risks to the earthworm, plant, American robin, deer mouse, and montane shrew exist at SWMU 49-004, this statement is inconsistent with the HIs presented in Sections I-5.3.2, I-5.4.5.2, and I-5.4.7.2, which were all calculated to be greater than 1 for the aforementioned biota. Revise the statement to clarify that the HI was greater than 1 for the aforementioned biota under the adjusted/unadjusted ESLs, and LOAEL-based ESLs as described in Sections I-5.3.2, I-5.4.5.2, I-5.4.7.2, and Table I-5.4-11; The Permittees also state that "based on an analysis of background values and field observations, the Permittees believe there to be a minimal potential ecological risk" but do not provide references or documentation to support this position.

DOE Response

11. The summary of ecological risk screening presented in the text in section 6.3.6 is based on the interpretation of ecological risk screening results presented in Appendix I, section I-5.5. This section of the report is intended to present the overall conclusions of the ecological risk screening results, not to provide details concerning how those conclusions were reached. The latter are presented in the site-specific discussions in Appendix I. This approach is consistent with previous investigation reports and SIRs approved by NMED. No revision to the report is necessary.

NMED Comment

12. Section 6.7.4.4, Nature and Extent of Contamination, page 64:

The Permittees have demonstrated that the extent of arsenic contamination at SWMU 49-001(f) is defined and that no additional sampling is warranted for defining the vertical extent of contamination. However, the discussion does not provide any lines of evidence or references indicating that the lateral extent of arsenic contamination has been defined. Revise the discussion on the extent of arsenic contamination at SWMU 49-001(f) to include lines of evidence demonstrating that the lateral extent of contamination has been defined or propose additional sampling to define lateral extent in phase II of this investigation.

DOE Response

12. Section 6.7.4.4 indicates that lateral extent of arsenic is not defined (i.e., concentrations increase laterally) but notes that further sampling for lateral extent is not warranted. Section 6.7.4.4 will be revised to include additional lines of evidence to better explain the justification for not performing additional sampling for lateral extent.

NMED Comment

13. Section 6.11.4.4, Nature and Extent of Contamination, page 90:

The Permittees state that thallium concentrations increase laterally and with depth (at most sampling locations) at AOC 49-008(d). The discussion also indicates the detected concentrations and elevated DLs exceed the residential SSL for thallium. Based on the information currently provided, the discussion does not demonstrate that the extent of thallium contamination at AOC 49-008(d) has been defined. Revise the discussion on the extent of thallium contamination at AOC 49-008(d) to include lines of evidence demonstrating that the lateral extent of contamination has been defined and/or additional sampling to define lateral extent is not warranted. If sufficient lines of evidence cannot be provided, LANL should propose additional sampling for thallium at AOC 49-008(d).

DOE Response

13. Section 6.11.4.4 will be revised to include additional lines of evidence to better explain the justification for not performing additional sampling for extent of thallium.

NMED Comment

14. Appendix B-5.9, Decontamination of Sampling Equipment, page B-4:

Provide a basis for use of Fastastik® for the decontamination of equipment (e.g., SW-846 citation).

DOE Response

14. Fantastik has been used for dry decontamination since before the TA-49 outside NES investigation in 2010 and its use has been described in reports previously approved by NMED. DOE notes that the effectiveness of the decontamination fluid is evaluated through collection and analysis of equipment rinsate blanks.

NMED Comment

15. Appendix H, Box Plots and Statistical Results, page H-1:

When applicable to the scale of the plot, provide additional lines to all the box plots depicting Industrial and Construction Soil Screening Levels to facilitate in comparison of results.

DOE Response

15. Comment noted. Adding human health screening levels to box plots prepared for future reports will be considered.

NMED Comment

16. Appendix I, Section I-5.3, Summary of Ecological Risk Screening, page I-24:

The Permittees state that no potential ecological risks to the earthworm, plant, American robin, deer mouse, montane shrew, and kestrel exist at SWMU 49-005(a), this statement is inconsistent with the HIs presented in Sections I-5.3.3 the kestrel, robin, shrew, deer mouse, and plant, for the HIs presented in Section I-5.4.7.3 for the plant and earthworm. Revise the statement to clarify which biota have risk greater to or less than 1 and reference the sections in attachment I so this information is cross-referenced.

DOE Response

16. See response to specific comment 10. No revision to the report is necessary.

NMED Comment

17. Appendix I, Section I-5.3.8, Evaluation of Burrow Air Pathway, page I-26:

It is unclear from the Permittees description of their analysis of air pathways for burrowing animals (based on the pocket gopher) and references Table I-5.2-16, Burrow Air Screening, what source(s) for the Gopher Burrow Air ESLs were used in this analysis. Revise Section I-5.3.8, and the description in Table I-5.2-16 to identify the source(s) for the Gopher Burrow Air ESLs were used in this analysis.

DOE Response

17. The equation and exposure factors for calculating gopher burrow air ESLs are in the LANL SLERA document, Revision 4 (LANL 2015, 600982), and all parameters used to calculate gopher burrow air ESLs are in the ECORISK database (LANL 2015, 600921). The requested footnote will be added to Table I-5.2-16.

EDITORIAL COMMENTS

NMED Comment

18. Appendix I, Section I-5.3.6, AOC 49-008(c), page I-26

This Section states that the HI for the American Kestrel (intermediate carnivore) is greater than 1. However, Table I-5.3-13, HI Analysis for AOC 49-008(c), and verification calculations indicate HIs equivalent to 1 for the American Kestrel (intermediate carnivore). Revise the discussion in Section I-5.3.6 to clarify that the analysis resulted in an HI equivalent to 1 for this ecological receptor population.

DOE Response

18. The text in section I-5.3.6 will be revised to indicate the hazard index for the American kestrel is equivalent to 1.

NMED Comment

19. Appendix I, Table I-2.3-4, page I-49

This Section identifies 0.069 mg/kg as the minimum concentration and the maximum detected concentration for bis(2-ethylhexyl)phthalate; this is inconsistent with Table I-2.3-4 which identifies 0.34 mg/kg as the maximum concentration of bis(2-ethylhexyl)phthalate. Revise the text in Table 6.3-3 to note that 0.069 mg/kg was the minimum concentration of bis(2-ethylhexyl)phthalate regardless of depth, and that it was the only detected concentration in the 0 to 10 feet below ground applicable to residential receptors, and that the overall maximum of 0.34 mg/kg was not included due to it not being detected at an applicable depth for the purposes of this calculation.

DOE Response

19. The maximum concentrations presented in the exposure point concentration (EPC) tables are the maximum detected concentration or the maximum detection limit, depending on which is greater. Likewise, the minimum concentrations presented in the EPC tables are the minimum detected concentration or the minimum detection limit, depending on which is smaller. There are two sample results in the 0–10 ft interval for this site and COPC. One is a detection and other a nondetection. For organic chemicals for which upper confidence limits cannot be calculated, the maximum detected concentration is used as the EPC for the risk assessment. In this case the minimum concentration is also the maximum detected concentration. No notes are needed to explain this circumstance as the (UJ) qualifier included with the maximum concentration identifies this result as a detection limit rather than a detected concentration.

NMED Comment

20. Appendix I, Section I-5.1, Scoping Evaluation, page I-23

The ninth bullet indicates that the American Kestrel represents avian insectivores and avian carnivores. This is inconsistent with the description in the eighth bullet which notes that the American Robin represents the avian insectivores; and also inconsistent with the description in Table I-5.3-1, which indicates the American Kestrel represents avian intermediate carnivores and the avian top

carnivore. Revise the ninth bullet to indicate the American Kestrel represents avian intermediate carnivores and the avian top carnivore in the ecological screening risk assessment.

DOE Response

20. The text description of the receptors (ninth bullet) will be revised to "American kestrel (avian intermediate carnivore and avian top carnivore [surrogate for threatened and endangered (T&E) species (primarily the Mexican spotted owl)])."

REFERENCES

- Kelly, E., G. Gonzales, L. Soholt, M. Hooten, and R. Rytí, May 1998. "Screening Level Ecological Risk Assessment Approach for the Environmental Restoration Project at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-1822, Los Alamos, New Mexico. (Kelly et al. 1998, 057916)
- LANL (Los Alamos National Laboratory), September 22, 1998. "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory document LA-UR-98-4847, Los Alamos, New Mexico. (LANL 1998, 059730)
- LANL (Los Alamos National Laboratory), January 2008. "Investigation Work Plan for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary, Revision 1," Los Alamos National Laboratory document LA-UR-08-0447, Los Alamos, New Mexico. (LANL 2008, 102691)
- LANL (Los Alamos National Laboratory), October 2015. "Screening-Level Ecological Risk Assessment Methods, Revision 4," Los Alamos National Laboratory document LA-UR-15-27577, Los Alamos, New Mexico. (LANL 2015, 600982)
- LANL (Los Alamos National Laboratory), October 2015. "ECORISK Database (Release 3.3)," on CD, LA-UR-15-27397, Los Alamos National Laboratory, Los Alamos, New Mexico. (LANL 2015, 600921)
- 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), April 2018. "Screening-Level Ecological Risk Assessment Methods, Revision 5.1," Los Alamos National Laboratory document LA-UR-18-22418, Los Alamos, New Mexico. (LANL 2018, 602965)
- NMED (New Mexico Environment Department), March 1998. "Risk-Based Decision Tree Description," in *New Mexico Environment Department Hazardous and Radioactive Materials Bureau RCRA Permits Management Program RPMP Document Requirement Guide*, Santa Fe, New Mexico. (NMED 1988, 057761)

NMED (New Mexico Environment Department), June 7, 2016. "Approval, Screening-Level Ecological Risk Assessment Methods, Revision 4," New Mexico Environment Department letter to D. Hintze (DOE-EM) and M.T. Brandt (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2016, 601533)

NMED (New Mexico Environment Department), August 5, 2016. "Review, Ecorisk Database, Release 3.3," New Mexico Environment Department letter to D. Hintze (DOE-EM-LA) and M. Brandt (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2016, 601696)

NMED (New Mexico Environment Department), March 2017. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 2, Soil Screening Guidance for Ecological Risk Assessments," Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2017, 602274)

NMED (New Mexico Environment Department), June 19, 2019. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," February 2019 (Revision 2, 6/19/19), Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2019, 700550)

**Response to the Draft New Mexico Environment Department Draft Comments on U.S. Department of Energy Draft Responses for the Revised Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary
Dated April 7, 2022**

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim (in italics). The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment. The comment numbers referenced below correspond to NMED's original comments provided to DOE on January 11, 2022, and DOE's responses on March 15, 2022.

NMED Comment

1. *The response provided indicates that the report will be reviewed and revised as appropriate based on NMED's comment. Please note that responses cannot be fully evaluated by NMED and a determination of adequacy cannot be made at this time because revised language was not provided at this time.*

However, the response indicates that in general, if the maximum concentration is sufficiently less than the SSL/SAL (e.g., less than 10%), additional lines of evidence may not be needed. This topic was discussed in length at the February 2, 2017 Supplemental Investigation Report (SIR) meeting. A value of 10% was not agreed upon, but rather, the outcome of the 2017 meeting was that if the site concentration is significantly lower than the SSL (e.g., orders of magnitude) it was agreed that this comparison was sufficient as a single line of evidence. Note that the agreement was orders (plural) of magnitude, not 10%. The DOE's Response must be revised to clarify and be consistent with the agreements made in the February 2017 meeting.

DOE Response

1. As discussed with NMED on March 23, 2022, the redline version of this supplemental investigation report (SIR) will be sent to NMED on April 25, 2022, when the document is submitted for internal peer review. As indicated previously, not all of the specific text changes are available as the revision has not been completed.

DOE has received responses to seven SIRs with essentially the same comment as NMED Comment #1 regarding section 5.2 of the reports. DOE has consistently responded to this comment and indicated the report sections evaluating nature and extent of contamination will be reviewed and revised as appropriate based on the criteria in NMED's comment. In no cases did the criteria in NMED's seven previous comments specifically refer to "orders" of magnitude. The comment previously submitted by NMED for these seven SIRs included the following statement:

The Permittee considers that no further sampling for extent is warranted if the applicable SSL/SAL is at least an order of magnitude greater than the maximum COPC concentration. While the above approach is not recommended in the NMED Soil Screening Guidance (SSG), as agreed during the February 14, 2017 meeting, the approach may be applied as a single line of evidence to determine that no further sampling is warranted for the COPC in question if the caveats listed below are met and sufficient justification for the applied methodology (including references) is provided in the discussion.

For all seven DOE responses, NMED approved the response to this comment. All seven SIRs were subsequently approved by NMED with these changes incorporated. Table 1 includes the list of responses and the date NMED approved the corresponding SIR. This technical approach of using the soil screening level (SSL)/screening action level (SAL) comparison as a single line of evidence (based on at least an order of magnitude), has been applied to these seven SIRs and to all investigation reports (IRs) submitted after the February 14, 2017, meeting. Table 2 includes the reports that implemented this approach and the current NMED document status.

NMED's current position, based on Comment #1, is contrary to NMED's previous comments and subsequent approval of this approach in SIRs and IRs. DOE is concerned that NMED's new interpretation of the agreement in the February 14, 2017, meeting not only impacts this SIR, but potentially impacts all previously submitted SIRs and IRs that implemented this approach and were approved by NMED. The question about order versus orders of magnitude is not consistent with NMED comments on the seven previously submitted and approved SIRs. Therefore, to maintain consistency, the current technical approach will continue to be implemented in future IR submittals, and as indicated in the original response to this comment, the report sections evaluating nature and extent of contamination will be reviewed and revised as appropriate based on the criteria in NMED's comment. The revisions made to the nature and extent discussions will be consistent with those made in SIRs previously approved by NMED. No additional changes to the text or the technical approach are warranted.

NMED Comment

- 10. The DOE's statement that no ecological risk is present is inconsistent with the data. At a minimum, the text must be revised to indicate that low or minimal risk is present; "no" risk is not acceptable.*

DOE Response

10. The text in section 6.2.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.2.6 will be revised as follows:

"Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for threatened and endangered [T&E] species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and chemicals of potential ecological concern (COPECs) without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 49-001(a)."

NMED Comment

- 11. The DOE's statement that no ecological risk is present is inconsistent with the data. At a minimum, the text must be revised to indicate that low or minimal risk is present; "no" risk is not acceptable.*

DOE Response

11. The text in section 6.3.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.3.6 will be revised as follows:

"Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket

gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMUs 49-001(b,c,d,g).”

NMED Comment

16. The DOE’s statement that no ecological risk is present is inconsistent with the data. At a minimum, the text must be revised to indicate that low or minimal risk is present; “no” risk is not acceptable.

DOE Response

16. The text in section 6.6.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.6.6 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 49-001(e).”

The text in section 6.7.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.7.6 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 49-001(f).”

The text in section 6.9.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.9.6 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at SWMU 49-003.”

The text in section 6.10.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.10.6 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 49-008(c).”

The text in section 6.11.6 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 6.11.6 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at AOC 49-008(d).”

The text in section 7.2.2 will be revised to indicate there are no potential unacceptable ecological risks instead of no potential ecological risk. The text in section 7.2.2 will be revised as follows:

“Based on evaluations of the minimum ESLs, HI analyses, potential effects to populations (individuals for T&E species), LOAEL analyses, the relationship of detected concentrations and screening levels to background concentrations, and COPECs without ESLs, no potential unacceptable ecological risks to the earthworm, plant, American robin, American kestrel, pocket gopher, deer mouse, montane shrew, desert cottontail, red fox, and Mexican spotted owl exist at any of the TA-49 sites inside the NES.”

**Table 1
Status of Previously Submitted SIR Responses to NMEDs Comment #1**

SIR Response Document	Comment Number	SIR Approval Date
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for Threemile Canyon Aggregate Area, Dated January 30, 2018	3	8/28/2018
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for S-Site Aggregate Area, Dated October 29, 2018	2	10/25/2019
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for the Potrillo and Fence Canyons Aggregate Area, Dated May 13, 2019	2	10/16/2020
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for Cañon de Valle Aggregate Area Technical Area 14, Dated July 2, 2019	3	11/18/2020
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for Upper Mortandad Canyon Aggregate Area, Dated March 19, 2020	3	9/9/2020
Revised Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for Upper Cañada del Buey Canyon Aggregate Area, Dated May 26, 2020	3	3/4/2021
Response to Draft New Mexico Environment Department Comments on the Supplemental Investigation Report for Lower Sandia Canyon Aggregate Area, Dated January 27, 2021	2	8/5/2021

Table 2
Previously Submitted Reports Incorporating the SIR Response to NMED Comment #1

Report Title	Date Submitted to NMED	NMED Document Status
Investigation Report for the Former Los Alamos Inn Property Sites within the Upper Los Alamos Canyon Aggregate Area, Revision 1	5/25/2017	Approved 6/6/2017
Supplemental Investigation Report for Threemile Canyon Aggregate Area, Revision 1	7/31/2018	Approved 8/28/2018
Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 2	9/27/2018	Pending Review
Investigation Report for DP Site Aggregate Area Sites at DP East, Revision 1	12/19/2018	Approved 12/28/2018
Supplemental Investigation Report for S-Site Aggregate Area, Revision 1	4/25/2019	Approved 10/25/2019
Supplemental Investigation Report for Potrillo and Fence Canyons Aggregate Area, Revision 1	7/31/2019	Approved 10/16/2020
Supplemental Investigation Report for Cañon de Valle Aggregate Area, Technical Area 14, Revision 1	2/3/2020	Approved 11/18/2020
Addendum to the Phase II Investigation Report for Middle Los Alamos Canyon Aggregate Area, Revision 1	4/9/2020	Pending review
Supplemental Investigation Report for Upper Mortandad Canyon Aggregate Area, Revision 1	6/29/2020	Approved 9/9/2020
Supplemental Investigation Report for Upper Cañada del Buey Aggregate Area, Revision 1	9/16/2020	Approved 3/4/2021
Investigation Report for Chaquehui Canyon Aggregate Area	9/30/2020	Approved 9/29/2021
Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, Revision 1	3/5/2021	Approved 3/23/2021
Supplemental Investigation Report for Lower Sandia Canyon Aggregate Area, Revision 1	5/27/2021	Approved 8/5/2021
Phase II Investigation Report for Chaquehui Canyon Aggregate Area	8/31/2021	Pending review
Investigation Report for South Ancho Canyon Aggregate Area	9/29/2021	Pending review
Investigation Report for Lower Water/Indio Canyons Aggregate Area	9/30/2021	Pending review
Addendum to the Investigation Report for Chaquehui Canyon Aggregate Area for Material Disposal Area K, at Technical Area 33	10/28/2021	Pending review

Response to the New Mexico Environment Department Draft Comments on U.S. Department of Energy Draft Responses for the Revised Supplemental Investigation Report for Sites at Technical Area 49 Inside the Nuclear Environmental Site Boundary
Dated May 10, 2022

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim (in italics). The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment. The comment numbers referenced below in NMED's comments correspond to NMED's original comments provided to DOE on January 6, 2022, and DOE's responses on March 15, 2022.

NMED Comment

1. *NMED finds DOE's proposed response is sufficient for the following comments numbered 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15, 17, 18, 19, and 20.*

DOE Response

1. Comment noted.

NMED Comment

2. *NMED Comment on items 10, 11, and 16:*

As noted previously, NMED disagrees with the statements in the report (Sections 6.2.6 and 6.3.6 and Appendix I Section I-5-3) and that no ecological risk is present, as the results of the ecological risk assessment provided in Appendix I showed final hazard indices (HIs) greater than one at several sites and for multiple receptors. Appendix I does contain discussions of lines of evidence to conclude that the elevated HIs do not indicate potential unacceptable risk. However, the main text of the report (Sections 6.11.6 and 7.2.2) was revised to state that no potential unacceptable ecological risks are present. While minor difference in the language, Appendix I indicates that risks are minimal while the main text still indicates no risk, which is incongruous with the calculations in Appendix I. NMED agrees that with respect to impacts on ecological populations, reproductive endpoints are the most concerning, and if the HI is below 10, there is minimal impact to the population, but some potential may be present (see references below). The main text must be revised for consistency with Appendix I. Sections 6.11.6 and 7.2.2 must be revised to indicate that the "potential for unacceptable risk is minimal."

References:

Menzie, C.A., J. Cura, J. Freshman, and S. Svirsky, 1993. Application of Ecological Risk Assessment to Hazardous Waste Site Remediation. Water Environment Federation, Workshop Proceedings, USEPA Science Advisory Board.

Tannenbaum, Lawrence V., Mark S. Johnson, and Matthew Bazar, 2003. Application of the Hazard Quotient method in Remedial Decisions: A Comparison of Human and Ecological Risk Assessments. Environmental Health Risk Assessment Program, Health Effects Research Program, U.S. Army Center for Health Promotion and Preventive Medicine, 5158 Blackhawk Road, Aberdeen Proving Ground, Aberdeen, Maryland 21010-5403. Human and Ecological Risk Assessment: Vol. 9, No. 1, pp. 387-401 (2003).

Tannenbaum, Lawrence V., 2004. A Critical Assessment of the Ecological Risk Assessment Process: A Review of Misapplied Concepts. Integrated Environmental Assessment and Management — Volume 1, Number 1—pp.66–72.

DOE Response

2. The text in sections 6.11.6 and 7.2.2 will be revised to state that based on the results of the ecological risk assessment, the potential for unacceptable ecological risks is minimal.