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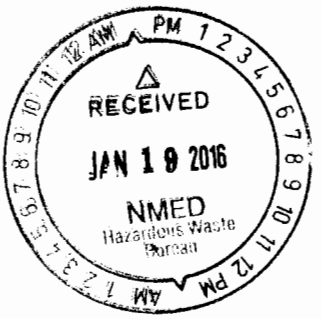

January 11, 2016

DCN: NMED-2016-01

Mr. David Cobrain
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Dr. East
Building One
Santa Fe, NM 87505

RE: Evaluation of the Response to the Disapproval for the Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area, Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-13-042, dated April 14, 2015.

Dear Mr. Cobrain:

Attached please find the draft Evaluation of the Response to the Disapproval for the Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area, Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-13-042, dated April 14, 2015 (SIR RTC). As part of the evaluation, the Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area, Revision 1 dated September 2015 (Revised SIR) was reviewed to ensure that information addressing the issues raised in NMED's comments was incorporated into the report text.

Our evaluation indicates that the facility response to NMED General Comments 3 through 5 and NMED Specific Comments 9, 10, 11, 13, 14, 16, 17, 18, and 25 through 28 adequately addressed the issues raised in the original comments. The response to NMED Specific Comment 24 adequately addressed the issue raised in the original comment; however, this comment is included in the evaluation to note additional clarification. The responses to the remaining comments were determined to be inadequate and an evaluation of the response, as well as any additions and revisions to the Revised SIR was conducted. These evaluations identify the remaining issues with the original comment and outline the information needed to address these issues.

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If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

Paige Walton

Paige Walton
AQS Senior Scientist and Program Manager

Enclosure

cc: Neelam Dhawan, NMED (electronic)
Mike Smith, AQS (electronic)
Joel Workman, AQS (electronic)

Evaluation of the Response to the Disapproval for the Supplemental Investigation Report for Upper Sandia Canyon Aggregate Area Los Alamos National Laboratory EPA ID No. NM0890010515, HWB-LANL-13-042 Dated April 14, 2015

General Comments

1. **Evaluation of Facility Response to NMED Comment 1:** The facility response partially addresses the issue raised in the original comment. In its response, LANL provides additional discussion and lines of evidence supporting the assertion that PAH exceedances found at some SWMUs and AOCs [eight SWMUs and AOCs are listed as examples in General Comment 1, SWMUs 03-014(k,l,m,n), 03-045(a), 03-015, 03-052(f), AOCs 03-047(g), 03-051(c), and 61-002; AOC 03-053] are not associated with site activities. The response does not address the determination of PAH background concentrations at these sites as suggested in the comment. An evaluation of the lines of evidence presented in each of the discussions comprising the facility response is presented below:

   - **SWMUs 03-045(a), 03-015; AOC 03-053:** The first paragraph of the response to General Comment 1 indicates that the discussion of uncertainties associated with the risk estimates (in excess of the NMED target risk level of $1x10^{-5}$) at SWMUs 03-045(a), 03-015; AOC 03-053 focuses on the "overestimation" of risk because the maximum detected concentration was used as the exposure point concentration (EPC). As indicated in Section 5.0, Use of the SSLs, of the *Risk Assessment Guidance for Investigations and Remediation Volume I* dated December 2014 (2014 SSG), an exceedance of the NMED target level of $1x10^{-5}$ is an indication that further evaluation is warranted. While the identification and evaluation of the uncertainties associated with a risk estimate is a valid approach, NMED does not support use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. Since LANL states in their response that they are not making the argument that the PAHs are not site related, additional evaluation is needed to bound the risk. Where issues related to the use of the maximum detected concentration exist, NMED recommends the collection of additional data so that a statistically-derived EPC can be determined and a refined estimate of risk developed.

     Further, for example at SWMU 03-045(a), sample 03-608316 was only sampled for total petroleum hydrocarbons resulting in only one sample point, 03-608317, having PAH results. It is not clear that since the PAH data exceed risk, nature and extent has been demonstrated. Nor do the data allow if the sample location represents the worst case location. Additional sampling will resolve these issues.

   - **AOCs 03-047(g) and 03-051(c):** The second paragraph of the facility response to General Comment 1 indicates that the "unacceptable risk" at AOCs 03-047(g) and 03-

051(c) under the residential scenario is based on the use of the maximum detected concentrations of PAHs. As indicated in the evaluation for SWMUs03-045(a), 03-015; AOC 03-053, NMED does not support the use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. Additional PAH data should be collected and a statistically derived EPC used to refine risk estimates.

In addition, the second and third paragraphs of the response provide information related to the presence of PAHs at the two sites. The discussion includes several lines of evidence aimed at supporting the assertion that PAHs detected at these sites are not associated with site operations. However, adequate documentation has not been provided in the Revised SIR to assess the applicability of the assumptions. The following must be included in the Phase II IR:

- The second paragraph of the facility response should be incorporated into the text.
- A reference citation should be provided in the text for the following statement included in the second paragraph of the facility response to General Comment 1: "Low concentrations of TPH, including TPH-DRO, are often present even if the source of the PAHs is asphalt." LANL should ensure that the cited reference is listed in Section 11.0, References and Map Sources, of the Revised SIR.
- Reference citations should be provided in the Revised SIR and Appendix I for the worker interviews noted in the third paragraph of the response to General Comment 1. In addition, ensure these interviews or the project documents containing the information from the interviews are listed in Section 11.0, References and Map Sources, of the Revised SIR.
- Ensure that the MSDS provided in Attachment 2 of the responses is incorporated into the Phase II IR.

- **SWMU 03-014(k,l,m,n):** The second and third full paragraphs on page 3 of the SIR RTC repeat much of the information provided in Appendix I, Section I-4.4.2 for SWMU 03-014(k,l,m,n). As indicated in the evaluation for SWMUs03-045(a), 03-015; AOC 03-053, NMED does not support use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. Additional PAH data should be collected and a statistically derived EPC used to refine risk. The photographs of the SWMUs and the decaying berms provided by LANL as part of Attachment 3 of the SIR RTC have been incorporated into Appendix I as figures. Discussion of the photographs has been added to the uncertainty discussion for SWMU 03-014(k,l,m,n) and the discussion references Figure I-4.4.2 to illustrate sludge beds and decaying berms. The photographs show asphalt in the sludge beds but also show that the berms are integral to the design of these units (i.e., the decaying asphalt berms would not be present if it was not for the presence of the sludge beds). Thus it appears that the PAH contamination at SWMU 03-014(k,l,m,n) is due to the design and operation of these units. The information presented on PAHs at SWMU 03-014(k,l,m,n) in the main text and Appendix I of the Revised SIR and in

the SIR RTC should be reviewed and the Phase II IR include the exceedances of the target risk level under the industrial and residential scenarios. In addition, the Phase II IR should indicate that the exceedances are driven by PAHs associated with the design and operation of the sludge beds. Alternatively, LANL should provide multiple lines of evidence demonstrating that the decaying asphalt berms are not associated with the design and operation of SWMU 13-014(k,l,m,n).

- **SWMU 03-052(f):** The discussion at the bottom of page 3 and top of page 4 in the SIR RTC indicates that the "unacceptable risk" at this site under the industrial scenario is based on the use of the maximum detected concentrations of PAHs. As indicated in the evaluation for SWMUs03-045(a), 03-015; AOC 03-053, NMED does not support use of the maximum detected concentration as the EPC as the primary line of evidence for eliminating the exceedance from further consideration in the risk assessment. The last sentence of the discussion at the top of page 4 states that 95% UCLs were calculated for SWMU 03-052(f) for use as EPCs although the tools and/or methods used to derive the 95% UCLs are not identified or discussed. In addition, the discussion does not indicate why 95% UCLs were not used as EPCs in the initial risk estimates. The Phase II IR must identify and discuss the approach followed in calculating the 95% UCLs. If ProUCL or another statistical software package was used, the text should reference the location of the input and output files for the computer runs.

- **SWMU 03-014(k,l,m,n) and SWMU 03-052(f):** The balance of the response to General Comment 1 addresses uncertainties associated with the exposure time and exposure frequency used to estimate risk at SWMUs 03-14(k,l,m,n) and 03-052(f). The discussion proposes alternate values for exposure time (8 hours per day), and exposure frequency (12 and 24 hours per day) to reflect monthly and/or bimonthly maintenance of these outdoor sites. However, references for these values have not been provided. Further, there is no mechanism in place to enforce modified exposure assumptions. As such, deviating from the default exposure assumptions outlined in the NMED Soil Screening Guidance, SSG, (and default EPA values) has not been justified and is not approved.

LANL may still wish to determine background concentrations for PAHs for some sites as outlined in General Comment 1 as it appears that PAH contamination at some SWMUs and AOCs [e.g., SWMU 03-014(k,l,m,n)] is a result of the design and operation of the units.

2. **Evaluation of Facility Response to NMED Comment 2:** The facility response partially addresses the issue raised in the original comment. LANL indicates that the criteria noted in General Comment 2 (Henry's Law Constant greater than 1E-5 atm-m3/mole and an atomic mass of less than 200 g/mole) were used to identify volatile organic compounds (VOCs) to be included in the evaluation of the vapor intrusion pathway at the sites addressed in the SIR. However, this information has not been added to Appendix I, Section I-4.3. In addition, the third sentence of the response states that the text in Section I-4.3 notes that vapor intrusion was not evaluated if VOCs were not detected at a site.

However, examination of the 2014 SSG indicates that while bulk soil data can be used in a qualitative sense to delineate a vapor source or to determine if soil has been impacted and additional evaluation (e.g., collection and evaluation of soil gas data) is needed, facilities must not assume that non-detect results for bulk soil data at sites that include a mix of detected and non-detect results equate to an absence of a vapor source. As such, LANL has not addressed the issue raised in General Comment 2 regarding the inclusion of additional constituents in the vapor intrusion risk assessment evaluation at sites that include detected and non-detected results. The Phase II IR must include the information provided in the first sentence of the first paragraph of the LANL response to General Comment 2. In addition, review the vapor intrusion pathway evaluations for SWMUs 03-021, 03-056(a), 60-002 (West), and 60-007(a) as well as the evaluations presented in Sections I-4.3.1 through I-4.3.17 of the Revised SIR, revise as necessary to ensure that detected and non-detected VOCs are considered, and include the revised evaluations in the Phase II IR. Note that a quantitative evaluation of the vapor intrusion pathway may not be necessary if multiple lines of evidence as outlined in Section 2.5.2.2 of the 2014 SSG can be presented for these sites.

Specific Comments

1. **Evaluation of Facility Response to NMED Comment 6: Section 6.4.1.4, Site Contamination, pages 29-30.** The facility response partially addresses the issue raised in the original comment. The information provided in the first paragraph of LANL's response has been added to Section 6.4.1.4 of the Revised SIR. However, this information is not sufficient to address the issue raised in Specific Comment 6. In the response, LANL cites changes with depth of 0.02 mg/kg to 0.3 mg/kg for COPC concentrations at sampling location 03-608182. Examination of Table 6-4.3 of the Revised SIR indicates that these changes with depth represent increases of 181% and 217% in COPC concentration, respectively. Additional information is needed to demonstrate that risks under a construction worker scenario at SWMU 03-009(a) have been adequately characterized. There are sampling locations at SWMU 03-009(a) other than 03-22537 that provide results at depths greater than those sampled at locations 03-608181 and 03-608182. For example, Table 6.4-3 indicates that benzo(a)pyrene had a concentration of 0.944 mg/kg within the 9 to 10 feet depth interval at sampling location 03-608178. This concentration represents the maximum benzo(a)pyrene concentration measured at SWMU 03-009(a). Estimating the risk to a construction worker using this concentration results in a risk of 4.4×10^{-7}. Thus, estimating risks for COPCs identified as risk drivers using the maximum COPC concentrations at depth and comparing the results to those reported for the construction worker scenario (e.g., 3E-7) is a line of evidence that can be used to demonstrate that those risks have been adequately characterized. The Phase II IR must demonstrate that potential risks under a construction worker scenario have been adequately characterized at SWMU 03-009(a).

2. **Evaluation of Facility Response to NMED Comment 7: Section 6.4.2.4, Site Contamination, page 32:** The facility response partially addresses the issue raised in the original comment. The LANL response states that the nature and extent discussion for chromium is correct and that four entries in Tables 6.4-4, 6.4-5, and 6.4-6 were incorrect for

chromium. Examination indicates that these tables have been revised as indicated in the facility response. The response also notes that Table 6.4-5 has also been revised to add four nondetect results above the soil background value (BV) for cadmium and to remove four nondetect results for selenium below the soil BV. Examination of Table 6.4-5 shows that these revisions have been made. However, the response does not state why changes were made for cadmium and selenium. Additional information will be required to identify the source(s) of the incorrect values for cadmium and selenium originally presented in Table 6.4-5 and to explain why the values were changed.

3. **Evaluation of Facility Response to NMED Comment 8: Section 6.5.4.4, Nature and Extent of Contamination, page 46:** The facility response partially addresses the issue raised in the original comment. As indicated in the facility response, the text in Section 6.5.4.4 has been revised to state: "Concentrations did not change markedly across the site." NMED does not agree with the general characterization that concentrations did not change markedly. The facility response also states that the difference in copper concentrations across the site was "only 9.5 mg/kg." While this difference of less than 10 mg/kg is not presented and/or discussed in Section 6.5.4.4, it represents a change of over 1300% between the minimum and maximum copper concentrations at the site. LANL also cites the difference between minimum and maximum background concentrations of copper for the site. The percent difference is even larger than for the site copper concentrations. Thus, it appears that the variation in copper concentrations over the site underscore the need to use statistically based estimates of pertinent concentrations when making site-based decisions. The Phase II IR should address the variations in site and background copper concentrations presented in Section 6.5.4.4of the Revised SIR by eliminating characterizations such as: "Concentrations did not change markedly across the site" and replace them with statements such as: "Concentrations varied across the site from a minimum of 0.696 mg/kg to a maximum of 10.2 mg/kg."

4. **Evaluation of Facility Response to NMED Comment 12, Section 6.7.4.4, Nature and Extent of Contamination, page 65:** The facility response partially addresses the issue raised in the original comment. In the facility response, LANL has provided information on the numerical magnitude of the difference between the sample results at 0-1 foot bgs and 1-2 feet bgs for eight PAHs. In addition, the response proposes alternate values for exposure time and exposure frequency for the industrial scenario. As noted at the end of the response, this information has been incorporated into Section 6.7.4.4 of the Revised SIR. The facility response does not address the risk exceedance for the residential scenario.

   As noted in NMED Comment 12, benzo(a) anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected above the NMED residential SSLs at all depths at sample location 03-608219. It does not appear that any samples were collected below the 1-2 feet bgs depth interval at any sampling locations associated with SWMU 03-052(f). Because PAH concentrations at location 03-608219 exceed their residential SSLs at the maximum sampled depth and no samples have been collected at SWMU 03-052(f) at depths greater than 2 feet bgs, it appears that the vertical extent of contamination is not defined at the site and additional sampling should be proposed. Additional sampling is needed to define the vertical extent of contamination at SWMU 003-052(f).

5. **Evaluation of Facility Response to NMED Comment 15, Section 6.20.4.4, Extent of Contamination, page 165:** The facility response partially addresses the issue raised in the original comment. LANL has attempted to provide information illustrating that no concentrations of TPH-DRO at SWMU 03-056(a) exceed the applicable screening criteria. The information provided in the response has been incorporated into Section 6.20.4.4 of the Revised SIR. However, the response does not address the potential for TPH-DRO concentrations at depths greater than 2 feet bgs to be higher than the 288 mg/kg obtained at location 03-608347 for the 1-2 feet bgs depth interval. In addition, an error in the response presents some TPH-DRO concentrations as greater than the corresponding screening value when, in fact, they are not. The Phase II IR must clarify that "although concentrations increased with depth by 184 mg/kg at location 03-608347, the concentrations at this location were 17 times and 6 times less than the industrial screening guideline." In addition, either additional lines of evidence will be needed to illustrate the vertical extent of TPH-DRO contamination at SWMU 03-056(a) has been determined or additional samples proposed.

6. **Evaluation of Facility Response to NMED Comment 19, Section 8.3.5, Summary of Health Risk Screening, page 233:** The facility response partially addresses the issue raised in the original comment. NMED Comment 19 states: "The Permittees were directed to remove contaminated soils containing concentrations above the risk based screening levels and to collect confirmatory samples at SWMU 61-002 in a Notice of Approval Letter issued on November 9, 2010 for the Investigation Report for Upper Sandia Canyon Aggregate Area." The comment further states: "As stated previously, NMED cannot make a corrective action complete determination until additional remediation activities are conducted." In the response LANL asserts that "removal of contaminated soil is not warranted" and "Further remediation and confirmatory sampling at SWMU 61-002 is not appropriate." While some new information has been provided in the facility response, it has not been incorporated into the Revised SIR. In fact, examination of the Revised SIR indicates that no revisions to Section 8.3.5 or Appendix I Sections I-4.2.37, I-4.4.2, I-4.5.37 were made in response to this comment (note that SWMU 61-002 is not addressed in the uncertainty analysis presented in Section I-4.4 of the Revised SIR). The response also notes that LANL has recommended corrective action complete with controls for SWMU 61-002.

   In the next to last paragraph of the response, LANL states that the NMED approval letter of November 9, 2010 indicated that use of 95% UCLs as EPCs was inappropriate when evaluating risks. Since that time, the 2012 and 2014 versions of NMED's SSG have provided recommended approaches for determining 95% UCLs suitable for use as EPCs when evaluating risk. However, it does not appear that LANL has recalculated risks at SWMU 61-002 using a 95% UCL as the EPC for each COPC of interest as such an evaluation is not described in the response or in the Revised SIR. NMED recommends that the risk and hazard for SWMU 61-002 under the residential scenario be recalculated using 95% UCLs determined as recommended in the 2014 SSG as the COPC EPCs and the uncertainties associated with the new estimate(s) assessed. Based on the results, conclusions and recommendations for SWMU 61-002 should be reevaluated and presented to NMED in the Phase II IR. The reevaluated risk(s) should also be presented as a line of evidence supporting the new facility conclusions and recommendations regarding SWMU 61-002.

7. **Evaluation of Facility Response to NMED Comment 20 Section I-4.4.2, Exposure Evaluation pages I-45 – I-51:** The facility response partially addresses the issue raised in the original comment. The last paragraph of the response indicates that Section I-4.4.2 has been revised to include a discussion addressing the activity patterns of the receptors addressed in the SIR. Examination of the revisions to Section I-4.4.2 indicates that the majority of the information contained in the response to NMED Comment 20 has been incorporated into Appendix I of the Revised SIR. However, the information in the facility response related to the activity patterns of ecological receptors was not found. Additional documentation in the Phase II IR is required to include the information furnished in the response regarding activity patterns for ecological receptors.

8. **Evaluation of Facility Response to NMED Comment 21 Section I-4.4.2, Exposure Evaluation pages I-45 – I-51:** The facility response partially addresses the issue raised in the original comment. As indicated by LANL, Section I-4.4.2 has been revised to include the information contained in the response to NMED Comment 21. However, additional issues related to PAHs at some sites remain and are discussed in the evaluation of NMED Comment 1.

9. **Evaluation of Facility Response to NMED Comment 22 Section I-4.4.2, Exposure Evaluation pages I-45 – I-51:** The facility response does not address the issue raised in the original comment. However, the response notes that the issues raised in NMED Comment 22 are addressed in the facility response to NMED Comment 1. As previously indicated, NMED has addressed the outstanding issues related to PAHs at some sites in the evaluation of NMED Comment 1.

10. **Evaluation of Facility Response to NMED Comment 23 Section I-4.4.2, Exposure Evaluation pages I-45 – I-51:** The facility response partially addresses the issue raised in the original comment. LANL has revised Section I-4.5.9 as indicated; however, issues related to existing contamination at SWMUs 03-014(k,l,m,n) remain and are addressed in NMED's evaluation of the facility response to NMED Comment 1.

11. **Evaluation of Facility Response to NMED Comment 24, Tables I-2.3-8, I-2.3-14, I-2.3-15, I-2.3-18, I-2.3-19, I-2.3-20, I-2.3-21, I-2.3-22, I-2.3-24, I-2.3-25, I-2.3-26, I-2.3-30, I-2.3-32, I-2.3-33, I-2.3-35, I-2.3-36, I-2.3-38, I-2.3-48, I-2.3-55, I-2.3-56, I-2-3-66, I-2.3-67, I-2.3-69, I-2.3-74, I-2.3-75, I-2.3-78, I-2.3-79, I-2.3-82, and I-2.3-84, pages I-134 – I-224:** The facility response adequately addresses the issue raised in the original comment. NMED notes that the 2014 SSG (e.g., Section 2.72 for background threshold values; Section 2.7.7 for exposure point concentrations) recommends the use of the "most recent version" of ProUCL to determine statistical-based descriptors of environmental data sets when those data meet the minimum requirements delineated in the accompanying User's Guide and Technical Guide.

12. **Evaluation of Facility Response to NMED Comment 29, Table I-5.3-42, page I-398:** The facility response partially addresses the issue raised in the original comment. In the facility response LANL notes that the inorganic chemicals identified in NMED Comment 29 were

not detected above the applicable background values (BV). In addition, the response indicates that these chemicals were only detected above the BV in the 6 to 7 feet bgs depth interval. While not mentioned in the response, an examination of Appendix I, Section I-5.1, page I-83 indicates that ecological risks were assessed over the 0 to 5 feet bgs depth interval. Thus, the detections above the applicable BVs for these inorganics were outside of the depth below ground surface considered in the ecological risk analysis. The Phase II IR must state that ecological exposures were evaluated over the 0 to 5 feet bgs in the ecological risk analysis and detections above the BVs of the inorganics identified in NMED Comment 29 occurred at depths greater than those addressed in the ecological risk assessment.