



NEVADA DIVISION OF
**ENVIRONMENTAL
PROTECTION**

STATE OF NEVADA
Department of Conservation & Natural Resources

Steve Sisolak, *Governor*
James R. Lawrence, *Acting Director*
Greg Lovato, *Administrator*

August 26, 2022

Jay A. Steinberg
Nevada Environmental Response Trust
35 East Wacker Drive, Suite 690
Chicago, IL 60601

Re: **Tronox LLC (TRX) Facility
Nevada Environmental Response Trust (Trust) Property
NDEP Facility ID #H-000539**
Nevada Division of Environmental Protection (NDEP) Response to: *Responses to NDEP
Comments dated March 2, 2022, Refined Screening-Level Ecological Risk Assessment for
Operable Unit 1 (Rev 0)*

Dated: May 13, 2022

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and provides comments in Attachment A. A revised Deliverable should be submitted by **10/26/2022** based on the comments found in Attachment A. The Trust should additionally provide an annotated response-to-comments letter as part of the revised Deliverable.

Please contact the undersigned with any questions at wdong@ndep.nv.gov or 702-668-3929.

Sincerely,

Dong Weiquan

Weiquan Dong, P.E.
Bureau of Industrial Site Cleanup
NDEP-Las Vegas City Office

WD:cp

EC:

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Attachment A

1 st NDEP Comments	NERT's Response	NDEP Comment on Response
General Comments		
<p>1. General Comment #1 – Overview: There are several issues with the lack of spatial plots for at least certain analytes, the automatic removal of analytes with a 5% detect frequency or less from the Tier 2 screening process, and a small amount of missing data from the BMI Regional Database. Additionally, as in the OU-2 SLERA comments, there are many background comparisons with p-values of 1 that have not been discussed in the body of the report. These points are covered in greater detail in the ‘Fatal Flaws’ section below, but these aside, no other major issues have been found that would affect the conclusions stated in section 5.</p>	<p>The following issues raised in this comment are discussed in the response to specific comments, as follows:</p> <ul style="list-style-type: none"> • Format for spatial plots (see response to Specific Comment 1) • How to address analytes with a 5% frequency of detection (see responses to Specific Comments 3, 11, and 14) • Data from the BMI Regional Database (see the responses to Specific Comments 28 and 29) • Constituents with p-values of 1 for background data not discussed in the report (Specific Comments 2 and 5). 	<p>The response is acceptable, pending review of the revised report.</p>
Specific Comments		
<p>1. <u>Specific Comment #1: Lack of Spatial Plots</u> There are no spatial plots in the report for any chemical, let alone COPCs. Home ranges for some of the animals considered in the SLERA are quite small (e.g., small rodents), perhaps similar to a residential exposure unit for human health risk assessment. When sampling locations are fairly sparse compared to the areas of interest some spatial analysis is warranted to ensure that hot spots of contamination are not being missed. This has been a <i>de facto</i> requirement on all risk assessment reports in the past and must be included here.</p>	<p>Subsequent to NERT’s submittal of the OU-1 Refined SLERA Report Revision 0 (August 2021), NDEP provided a memorandum to clarify the format preferred for the spatial representation of data (memorandum entitled “NERT Spatial Plot Recommendations” dated February 18, 2022). The 7-page memorandum identifies bubble plots, contours/interpolation, geostatistical kriging, and empirical Bayesian kriging. Revision 1 of the OU-1 Refined SLERA will include spatial plots using a format agreed upon by NDEP, NDEP the Trust, and Ramboll after review and various calls amongst the parties to discuss the NDEP memorandum. Accordingly, bubble plots will be prepared with a continuous scale, using ecological screening values, or refined screening values, as appropriate for the points to be made in Revision 1 of the OU-1 Refined SLERA. These spatial plots will be provided for the COPECs identified in the Refined SLERA process (i.e., all constituents with at least one detected concentration that exceeds a plant, soil invertebrate, mammal, or bird ecological screening value). Constituents lacking ecological screening values will be</p>	<p>The response is acceptable, pending review of the revised report.</p>

NDEP Comment	Response	NDEP Comment on Response
	<p>shown in spatial plots as part of the uncertainty assessment. In addition, the Revision 1 of the OU-1 Refined SLERA Report will be updated to cross reference the spatial bubble plots provided in the OU-1 Remedial Investigation (RI) Report.</p> <p>The findings of Revision 1 of the OU-1 Refined SLERA will be updated to include discussion of the spatial bubble plots, as appropriate. This new information will augment the more than 200 graphics with spatial representation of data for the key constituents of potential ecological concern (COPEC) already provided in the OU-1 Refined SLERA Report Revision 0, in the Figures from Section 3, Section 4, and Appendix E (including boxplots and cumulative frequency distributions).</p>	
<p>2. <u>Specific Comment #2: Background Comparisons</u> There is insufficient discussion of the background comparisons. The Gilbert’s Toolbox results presented in Table E-2b include many <i>p</i>-values that are equal to 1. In a 1-sided test this implies a strong significant difference between background and site data, but the wrong way around. In principle, site concentrations cannot be less than background, in which case these tests run as 1-sided tests. However, when statistical differences like this occur, then there are either unaccounted for analytical differences or the background data do not represent site conditions. There are a few places on the BMI Complex where site concentrations for some metals are less than the McCollough background on which background comparisons are performed. At the very least, some acknowledgement and discussion of the reasons why this might occur is warranted.</p>	<p>Additional discussion will be added to Section 2.1.5.2 of Revision 1 of the OU-1 Refined SLERA Report to address the issue raised in this comment regarding <i>p</i>-values of 1 and relevance regarding site conditions compared to background, including explanation that:</p> <ul style="list-style-type: none"> • The differences observed are likely a combination of geologic, analytical factors, and natural variance. • With the general natural variability of alluvial geology, even within a single geologic unit, it is unlikely to obtain a perfect representation of local background for every existing site data set or relevant subset of data across this study area. • Therefore, not every variance between site and background data must be due to anthropological influence or analytical issues. 	<p>Adding the suggested additional discussion will be acceptable, pending review of the revised report. However, some OU-specific discussion will need to be included discussing the meaningfulness of the background comparisons if the background data are not suitable for this OU. Box plots and/or quantile plots can be revealing in this situation and should be considered prior to finalizing results. The background comparisons, in effect, are used to statistically confirm what’s seen in the data.</p> <p>Please also note that precedent has been set to use the McCullough background levels when the more local site</p>

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<p>3. <u>Specific Comment #3: Section 3.2.1.2, p.3-2, Tier 2 Screening</u> Constituents detected in fewer than 5% of samples should not automatically be eliminated from further consideration unless a spatial analysis of those detects has been performed to ensure that those detects are not indicative of a localized release or hotspot. Although 5% is specified in the cited NDEP guidance, frequency of detect evaluations should always be balanced by a detection limit evaluation and by spatial analysis of those detects to ensure they do not represent a localized release or hot spot that represent unacceptable exposure or continuing source term. For example, additional discussion of the spatial distribution of the detects for the 6 chemicals excluded from the Operations Area as stated at the bottom of 3-3 is needed before they can be eliminated on the basis of low frequency detect. This comment applies to application of the low frequency of detection criteria to individual DUs as well.</p>	<p>USEPA and NDEP ecological risk assessment guidance identify that the refinement of COPECs may include consideration of low frequency of detection. The OU-1 Refined SLERA Revision 0 provided detail regarding the constituents detected at a low frequency, as follows:</p> <ul style="list-style-type: none"> • The constituents excluded on the basis of low frequency of detection were summarized in Tables 3-2a to 3-2e for each of the Ecological DUs in the OU-1 Refined SLERA Revision 0. For example, For the Operations Area, 17 constituents were excluded from further consideration based on low detection frequency (Table 3-2a). • Of these, 17 constituents: 5 constituents were detected at a frequency of 1%; 11 constituents were detected at a frequency of 2%; and 1 constituent was detected at a frequency 5%. • Also, for these 17 constituents: 6 constituents had hazard quotients greater than 1 and 11 constituents lacked ESVs. <p>While the 11 constituents with low detection frequency lacking ESVs were discussed in the uncertainty assessment and presented in tabular form in Appendix J-1, the 6 constituents detected at frequencies of 5% or less with HQs greater than 1 were identified in Tables 3-2a to 3-2e but the report did not discuss them in any significant detail in the uncertainty assessment. Therefore, to address the comment, Revision 1 of the OU-1 Refined</p>	<p>data are less than the McCullough sitewide background data. The point of the comparisons is simply to describe what the data appear to say. Decisions can be made based on these comparisons, but other information can, and has been brought help to make final decisions.</p> <p>The proposed response is acceptable, pending review of the revised text and spatial analysis. One additional note is that the issue is not that low frequency of detections were used to refine the COPECs, it's the concern that the low frequency of detection was without clear connection to detection limit and spatial analysis. Please make sure the revised text makes clear that additional considerations were used when refining COPECs in response to analytes with a low frequency of detection.</p>

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	<p>SLERA Report will include a discussion of the constituents with low detection frequency and hazard quotients greater than 1 in a new uncertainty assessment section. The uncertainty assessment discussion will include consideration of the magnitude of the hazard quotients, the spatial overlap with other COPECs exceeding ecological screening levels, and potential cumulative impacts from the presence of these constituents detected at low frequency when present at the same location as other key COPECs. In doing so, Revision 1 of the OU-1 Refined SLERA Report will present the uncertainty assessment balanced by a detection limit evaluation and spatial analysis to discuss potential localized impacts that may represent unacceptable exposure or a continuing source.</p>	
<p>4. <u>Specific Comment #4: Appendices C and D</u> There is data missing from the BMI Regional Database that are used in this report's analysis. See Comment #25 for more details. Data are checked against the BMI Regional Database to ensure NDEP-approved data is being used in these evaluations. When the data is not found in the database, it is a concern that must be resolved.</p>	<p>Please refer to the responses to Comments #28 and #29, which provide specific reference to the data from the BMI Database that is questioned. (Note that comment #25 is not related to the BMI database.)</p>	<p>See responses in Comments #28 and #29.</p>
<p>5. <u>Specific Comment #5: Appendix E</u> There is insufficient discussion of the background comparisons. The Gilbert's Toolbox results presented in Table E-2b include many <i>p</i>-values that are equal to one, and several others that are very high. In a 1-sided test this implies a strong significant difference between background and site data, but the wrong way around. In principle, site concentration cannot be less than background, in which case these tests are run as 1-sided tests. However, when differences like this occur, then there are either unaccounted for analytical differences or the background data do not represent site conditions. There are a few places on the BMI Complex where site concentrations for some metals are less than the McCollough background on which background comparisons are performed. At the very least, some acknowledgement and discussion of the reasons why this might occur is warranted.</p>	<p>Please refer to the response to Specific Comment #2.</p>	<p>See response in Specific Comment #2.</p>

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<p>6. <u>Specific Comment #6: Executive Summary, p. ES-2</u> The description of the ERA Tiered process is inconsistent within this document. Page ES-2 states that EPA Steps 1 and 2 comprise Tier 1, and Step 3a comprises Tier 2 of the SLERA process. However, elsewhere in the document, Tier 1 is used to describe conservative screening of OU-1 data as a whole (Section 3), Tier 2 is used to describe conservative screening of individual subareas within OU-1 (also in Section 3), and Step 3a of the ERA process (Section 4) is simply referred to as “Refined Screening”. Text should be revised to reflect that the screening activities in Section 3 of the report are Tier 1, while the Step 3a refinement presented in Section 4 is Tier 2 of the screening process.</p>	<p>Revision 1 of the OU-1 Refined SLERA Report will clarify that the screening activities (Steps 1 and 2 of USEPA’s Eight Step Ecological Risk Assessment Process) are included in the Tier 1 analysis, while Step 3a, the refinement step, comprises the Tier 2 analysis as illustrated in Figures 1-4 and 1-5.</p>	<p>The response is acceptable, pending review of the revised report.</p>
<p>7. <u>Specific Comment #7: Section 1</u> Section 1 of the report emphasizes in several places that OU-1 is largely “devoid of quality habitat”, has “little or no habitat... that provides nesting or foraging opportunities for wildlife” and is “generally barren of vegetation with bare soil as the primary feature.” This lack of ecological habitat should also be a point of emphasis in the risk characterization and conclusion sections of this document.</p> <p>Section 1 also states: “Based on the OU-1 reconnaissance efforts by a certified biologist in December 2014, there is little or no habitat in the OU-1 Refined SLERA Area that provides nesting or foraging opportunities for wildlife. OU-1 has been visited on four additional occasions by a certified biologist including as recently as June 2020.”</p> <p>Appendices A and B provide the site checklist and photolog from the 2014 site visit. If the site has been inspected by a certified biologist or ecologist as recently as 2020, please also include their findings as an appendix and note any changes in the site’s biological/ecological conditions that they may have identified.</p> <p>Did any of the subsequent site visits result in different</p>	<p>The Ramboll ecologists involved in the project now (2022) are the same as those involved in 2014, and as such, the conclusions in the report about the limited ecological habitat and condition will not change. However, Appendices A and B will be updated to provide more current information and photographs from the most recent site visits, as relevant.</p>	<p>The response is acceptable, pending review of the revised report.</p>

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<p>biological/ecological findings than the first? The conclusions of the report in Section 1 are explicitly predicated on the statement that “Currently, ecological exposures are limited given the limited habitat available on Site.” As such, it is reasonable to include the most recent opinion from the most recent site visits by a certified biologist/ecologist.</p>		
<p>8. <u>Specific Comment #8: Section 1, p. 1-3, Introduction</u> Please add the size of each of the Eco DUs and Parcel E to the description of those areas.</p>	<p>The size of each of the Eco DUs and Parcel E will be added to Section 1 (Introduction) of Revision 1 to the OU-1 Refined SLERA Report.</p>	<p>The response is acceptable, pending review of the revised report.</p>
<p>9. <u>Specific Comment #9: Section 2.1.4, p. 2-7, Exposure Media</u> Please add rooted plants to the list of receptors that have exposure to soil greater than 1-foot in depth.</p>	<p>Rooted plants will be added to the list of receptors that are exposed to soil greater than 1-foot in depth in Section 2.1.4 of Revision 1 to the OU-1 Refined SLERA Report.</p>	<p>The response is acceptable, pending review of the revised report.</p>
<p>10. <u>Specific Comment #10: Section 2.1.5, p. 2-8, Preliminary Chemicals of Potential Concern</u> Please add text to the first bullet to clarify that elimination of chemicals that are not detected is contingent upon evaluation of limits of detection relative to ESVs. Non-detected constituents can only be eliminated in screening if DLs are less than appropriate ESVs.</p>	<p>The OU-1 Refined SLERA included an uncertainty analysis for constituents not detected by comparison of the detection limits to ESVs (Appendix J-2a for the Operations Area and Appendix J-2b for Parcel E). Tables in Appendix J-2a and J-2b are organized by chemical, arranged from highest detection limit to lowest detection limit for each chemical with the ratios of detection limits (or ½ DLs) versus ESVs. The ratios are comparable to the hazard quotients. The uncertainty assessment briefly discusses these chemicals in Section 4.7.3.</p> <p>To address this comment in Revision 1 of the OU-1 Refined SLERA Report:</p> <ul style="list-style-type: none"> • The text in the first bullet in Section 2.1.5 will clarify that elimination of chemicals that are not detected includes an evaluation of detection limits relative to ESVs as part of the uncertainty assessment. • The uncertainty assessment discussion in Section 4.7.3 will be expanded to discuss those constituents with the highest ratios in more detail than currently discussed. As part of this expanded discussion, two additional tables will be added to Appendix J-2, 	<p>The response is acceptable, pending review of the revised report.</p>

NDEP Comment

Response

NDEP Comment on Response

	<p>which provide the same information as currently presented in Tables J-2a and J-2b, but the ratios will be sorted from highest to lowest for any chemical at any location to aid in the discussion of how these locations overlap with other detected COPECs.</p> <ul style="list-style-type: none"> • The uncertainty assessment in Section 4.7.3 will also include discussion of: <ul style="list-style-type: none"> • Where detection limits are influenced by dilutions that were applied for other chemicals being analyzed. • Which chemicals have all detection limits that exceed ESVs versus those with detection limits that exceed ESVs due to location-specific diluted samples. <p>Specific Comment #10 states that “Non-detected constituents can only be eliminated in screening if DLs are less than appropriate ESVs.”</p> <ul style="list-style-type: none"> • As can be seen in the Appendix J-2a and J-2b of the August 2021 OU-1 Refined SLERA Report, there are some chemicals where the detection limits exceed the ESVs. • The approach described in the response above shows that chemicals with DLs exceeding ESVs will be addressed in the updated uncertainty assessment. • It should be noted that Ramboll does not interpret this comment to indicate that NDEP wants chemicals with DLs exceeding ESVs included in the food web model and other quantitative assessment. However, if NDEP prefers that chemicals not detected with DLs greater than the ESV be included in the food web model or other quantitative assessment, this can be done, with acknowledgement that the actual results (i.e., hazard quotients) based on detection limits will be so uncertain that they are unlikely to change the conclusions of the report. 	
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NDEP Comment	Response	NDEP Comment on Response
<p>11. <u>Specific Comment #11: Section 2.1.5, p. 2-8, Preliminary Chemicals of Potential Concern</u> Please add text to the second bullet to clarify that the use of the 5% detection frequency as a criterion for elimination of chemicals as a COPC is contingent upon spatial evaluation of detects to ensure that the detected concentrations are not indicative of a localized release or hotspot. This analysis needs to be added to the report. See the first General Comment above.</p>	<p>In addition to the response to Specific Comment 3, the second bullet in Section 2.1.5 of Revision 1 of the OU-1 Refined SLERA Report will be clarified to indicate that the use of the 5% detection frequency as a criterion for elimination of chemicals as a COPEC is contingent upon the spatial evaluation of detected concentrations to ensure that the detected concentrations are not indicative of a localized release or potential areas of elevated concentration. The details of the spatial evaluation analysis will be added as an additional uncertainty assessment discussion.</p>	<p>The response is acceptable, pending review of the revised report.</p>
<p>12. <u>Specific Comment #12: Section 2.1.5.1, p. 2-9, Data Used in the SLERA</u> In the last bullet on the page, please clarify that DDx is usually defined as the sum of six isomers (2,4'-DDD, 4,4'-DDD, 2,4'-DDE, 4,4'-DDE, 2,4'-DDT, 4,4'-DDT). More discussion is needed as to why a varying number of isomers are included in the DDx sums here, and how that potentially effects DDx data comparability across the site.</p>	<p>Table D-7 of the OU-1 Refined SLERA summarizes the DDx isomer data available for each of the samples, including detected concentrations, detection limits for isomers not detected, isomers not analyzed, and the sum of the DDx value. As shown in Table D- 7, the 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT isomers were analyzed for all samples.</p> <p>To add additional clarity, the last bullet of Section 2.1.5.1, page 2-9 of Revision 1 of the OU-1 Refined SLERA Report, will also be clarified to indicate that DDx is the sum of available isomers (2,4'-DDD, 4,4'-DDD, 2,4'-DDE, 4,4'-DDE, 4,4'-DDT) and that the variability in the isomers will be addressed as an uncertainty in the uncertainty assessment.</p> <p>In addition, a new uncertainty discussion will be added to the Revision 1 of the OU-1 Refined SLERA to explain that the variability in the DDx isomers is related to the study designs that occurred over time and discuss the potential underestimate of risk via the sum of DDx given the lack of isomers at any particular location.</p>	<p>The response is acceptable, pending review of the revised report.</p>
<p>13. <u>Specific Comment #13: Section 2.1.5.1, p. 2-10, Data Used in the SLERA</u> Please clarify at the bottom of the page whether the reference to DDT should actually be to DDx. Please be consistent in use throughout the document and refer to DDx if the actual reference is to the sum of DDT, DDE, and DDD. See also the first paragraph on Page 2-11.</p>	<p>The reference at the bottom of the page referenced in the comment should be DDx rather than just DDT. Revision 1 of the OU-1 Refined SLERA will be reviewed for the consistent reference to DDx as DDT and metabolites, including the bullets on page 2-10 (as mentioned in this comment) and the first paragraph on page 2-11 which also mentions DDT.</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>

NDEP Comment	Response	NDEP Comment on Response
<p>14. <u>Specific Comment #14: Section 2.1.5.1, p. 2-11, Data Used in the SLERA</u> In the bullet describing detection frequency, please add discussion to note that elimination of chemicals based on a frequency of detection less than 5% is dependent on spatial evaluation of detects to ensure that they do not represent localized releases or hotspots. This analysis needs to be added to the report.</p>	<p>Please refer to the response to Specific Comments 3 and 11.</p>	<p>See the responses for specific Comments #3 and #11.</p>
<p>15. <u>Specific Comment #15: Section 2.1.6, p. 2-14, Potentially Exposed Receptors, and Figure 2-4, CSM</u> Text on Page 2-14 includes reptiles as potential receptors at the site. Figure 2-4 does not include reptiles in the CSM. Please add reptiles to the CSM.</p>	<p>Reptiles will be added to the CSM (Figure 2-4) in Revision 1 to the OU-1 Refined SLERA Report.</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>
<p>16. <u>Specific Comment #16: Section 2.1.7, p. 2-15, Exposure Pathways and Figure 2-5 example</u> Figure 2-5 is referred to as an “example” desert food web model. It is not clear why an “example” is used here. The food web model should represent the site-specific conditions to the extent they are known.</p>	<p>The food web model provided in Figure 2-5 correctly depicts the desert food web as evaluated in this Refined SLERA and each of the wildlife receptors included in Figure 2-5 are included in the food web model as shown in Tables 4-8a to 4-8e, 4-9a to 4-9e and 4-10a to 4-10f. The figure is referred to as an “example desert food web model” to acknowledge that the receptors shown in this figure provide a representative food web model and do not reflect all animals that exist in a desert. Revision 1 of the OU-1 Refined SLERA Report will clarify that Figure 2-5 reflects the potentially complete exposure pathways and wildlife receptors included in the desert food web model for the NERT Site.</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>
<p>17. <u>Specific Comment #17: Section 2.1.8, p. 2-17, Assessment Endpoint</u> The first full paragraph on the page should reference birds, mammals, and reptiles; not just birds and mammals.</p>	<p>Revision 1 of the OU-1 Refined SLERA Report will indicate “The assessment endpoints listed above consider attributes that are tied to population-level abundance and persistence (birds, mammals, and reptiles) or community level (plants and soil invertebrates), in that they consider survival, growth and reproduction.”</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>
<p>18. <u>Specific Comment #18: Section 2.2, p.2-18, Screening Level Effect Evaluation and elsewhere in document</u> The Los Alamos National Library EcoRisk Database has an updated version (v4.2) as of November 2020.</p>	<p>Revision 1 of the OU-1 Refined SLERA will cite and use the updated version of the Los Alamos National Library EcoRisk Database (v4.2 2020).</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>

NDEP Comment	Response	NDEP Comment on Response
<p>Please update where relevant. It may be found here and is now cited as N3B 2020:</p> <p>https://www.intellusnm.com/documents/document-library.cfc?method=retrieveLanlFile&nodeId=62152</p> <p>Citation: N3B (Newport News Nuclear BWXT-Los Alamos, LLC), November 2020. "ECORISK Database (Release 4.2)," on CD, Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0575, Los Alamos, New Mexico. (N3B 2020)</p>		
<p>19. <u>Specific Comment #19: Section 3.2.1.1, p. 3-3, Tier 1 Screening Results</u></p> <p>In the discussion of elimination of non-detects, please discuss whether limits of detection were compared to ESVs before eliminating these constituents. This should be done and presented as part of the Tier 1 screening, and any non-detected constituents with DLs exceeding ESVs should be identified in Tier 1 and carried forward and discussed in uncertainty.</p>	<p>The resolution of this comment is linked to the resolution of Specific Comment 10 for Section 2.1.5, with proposed edits discussed here as they pertain to Section 3.2.1.1.</p> <p>Tables 3-1a and 3-1b of Revision 1 of the OU-1 Refined SLERA will be updated to indicate that constituents not detected are excluded from the Tier 2 evaluation but are included in the uncertainty assessment. New columns will be added to Tables 3-1a and 3-1b to indicate if any of the detection limits exceed ESVs (yes/no) and the maximum ratio for the maximum detection limit.</p> <p>The text of Section 2 which discusses the Tier 1 screening will also be revised to clarify that chemicals not detected will be evaluated in the uncertainty assessment. In addition, the text of Section 3.2.1.3 which provides the Parcel E screening results and identifies that 175 chemicals were not detected will also be revised to clarify the detection limits for the 175 chemicals were evaluated and those chemicals with detection limits exceeding the ESVs are discussed in the uncertainty assessment.</p>	<p>The proposed revision is acceptable, pending review of the revised report.</p>
<p>20. <u>Specific Comment #20: Section 3.2.1.2, p. 3-4 to 3-5, Tier 2 Screening Results</u></p> <p>The level of granularity in the bulleted discussions of HQ ranges is not necessary and potentially misleading because it implies some sort of correlation between HQ and level of toxicity of a chemical, which is not</p>	<p>This section provides bullets that briefly summarize the hazard quotients (HQs) into the ranges of 0-100, 100-1,000, and greater than 1,000. The bullets generally match the color coding from the tables associated with this discussion. The color coding was provided to aid in the visualization of the HQs.</p>	<p>The proposed revisions are acceptable, pending review of the revised report. It would also be acceptable to caveat the analysis with a statement that HQs are not linearly related to potential toxicity</p>

NDEP Comment	Response	NDEP Comment on Response
<p>necessarily a linear relationship. For example, a chemical HQ of 60 may be just as toxic to an organism as an HQ of 40,000. Please revise the discussion accordingly.</p>	<p>The bullets factually state the HQs provided in Tables 3-2a (Operations Area), 3-2b (Eco DU-1), 3-2c (Eco DU-2), 3-2d (Eco DU-3), and 3-2e (Parcel E). Tables 3-3a to 3-3e provide a simple summary of the constituents retained for further analysis, along with Maximum HQs and those detected lacking ESVs.</p> <p>The bullets do not state or imply a significance or distinction in toxicity relative to the ranges. It is unclear what discussion NDEP desires to be revised except that all bullets can be omitted except the first bullet in each section which states the range of HQs. In other words, Revision 1 of the OU-1 Refined SLERA for the Operations Area, the bullet that states HQs of the retained chemicals ranged from 2 to 40,000 would remain but the following 3 bullets in the text which describe the chemicals and HQs will be omitted.</p> <p>In addition, the following changes will be made to pages 3-4 and 3-5 Tier 2 Screening Results, as follows:</p> <ul style="list-style-type: none"> • For Eco DU-1, the bullet stating “<i>Eco DU-1 HQs of the retained chemicals ranged from 2 to 40,000</i>” will remain in the revised report but the following 3 bullets in the text will be omitted. • For Eco DU-2, the bullet stating “<i>Eco DU-2 HQs ranged from 2 to 500</i>” will remain in the revised report but the following 3 bullets in the text will be omitted. <p>For Eco DU-3, the second bullet will end after the discussion of the chemicals compared to background (i.e., there will be no sub-bullets in Revision 1 of the OU-1 Refined SLERA). A new main bullet will be added to the revised report to state “Eco DU-3 HQs ranged from 3 to 10,000” and the other sub-bullets that describe the HQs will be omitted.</p> <ul style="list-style-type: none"> • For Parcel E, the first two sentences of the fourth bullet will remain in the revised report but the last sentence 	<p>(e.g. an HQ of 40,000 is not indicative of 400x greater toxicity than an HQ of 100).</p>

NDEP Comment	Response	NDEP Comment on Response
<p>21. <u>Specific Comment #21: Section 4.4.3, p.4-10, Refined Risk Calculations</u></p> <p>The use of RSV calculated from individual studies [i.e., Novais et al. (2010), Phillips (2002)], in lieu of published ESVs, needs to be further justified including how the studies were selected and what other studies may have been considered.</p>	<p>describing the chemicals with HQs greater than 1 will be omitted.</p> <p>The OU-1 Refined SLERA Section 4.4.3 provides discussion of the USEPA Region 4 ESV and alternative RSVs. Additional information of how those studies were selected and what other studies may have been considered will be added to Revision 1 of the OU-1 Refined SLERA Report.</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>
<p>22. <u>Specific Comment #22: Section 4.5.2.4, p. 4-23, and Appendix H</u></p> <p>The AUFs for food web modeling are said to be provided in Appendix H and summarized in Table 4-7a. Table 4-7a only provides AUFs for the “Facility Area”, and not for individual DUs and Parcel E, which are evaluated separately in the food web modeling. This information is also not included in Appendix H, where only the organism home ranges are provided in every Appendix H table. In Appendix H tables where site foraging frequency (SFF) values are provided, they are all equivalent to 1. The “realistic” AUFs used in SLERA refinement should be provided in Table 4-7a and Appendix H-2 tables for each area/DU and receptor evaluated in the SLERA, and the size of each area/DU should be provided in this section.</p>	<p>Table 4-7a of Revision 1 of the OU-1 Refined SLERA will be updated to show the AUFs for each of the Ecological areas (Operations Area, Ecological DUs 1, 2, and 3, and Parcel E).</p> <p>In addition, the Appendix H tables will be updated to replace “site foraging frequency” terminology with “area use factor” (AUF) terminology and show the home range divided by the site area for each ecological area (i.e., the Appendix H values will match the Table 4-7a values).</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>
<p>23. <u>Specific Comment #23: Section 4.7, p. 4-43, and Table 4-11</u></p> <p>The uncertainty discussion includes a statement that “There is limited toxicity information for reptiles and amphibians. To the extent that reptiles and amphibians may experience exposure and toxicological impacts similar to birds and mammals, general statements about potential risks to reptiles and amphibians can be made.” Additional discussion needs to be added about uncertainties and limitations of extrapolating between birds/mammals and reptiles regarding exposure parameters, including AUFs, assumed for site receptors.</p>	<p>Revision 1 of the OU-1 Refined SLERA Report will add discussion of the uncertainties and limitations of extrapolating between birds/mammals and reptiles regarding exposure parameters, including AUFs, assumed for site receptors. This will be added to the report discussion of uncertainties in Section 4.7. Elements of uncertainties discussion pertaining to reptiles and amphibians will also be added to Table 4-11, as appropriate.</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>

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<p>Reptiles are not specifically mentioned at all in Table 4-11. Also, the last sentence for Section 4.7 states that specific uncertainties are described “in the following five subsections”. There are only four subsections to Section 4.7, and uncertainties around reptile exposure and toxicity are not discussed in any of them.</p>		
<p>24. Specific Comment #24: Table 4-4 Please change the column headers from “BERA” to “SLERA”. This is not a baseline risk assessment. The values presented in the columns are no-effects based thresholds that are appropriate for a SLERA.</p>	<p>The column header in Table 4-4 of Revision 1 of the OU-1 Refined SLERA Report will be revised from “BERA” to “Refined SLERA.</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>
<p>25. Specific Comment #25: Table 4-12a and 4-12b The exclusion of chemicals (e.g., bromide) based on a detection frequency < 10% is inconsistent with NDEP guidance, which specifies a detection frequency threshold of < 5% for elimination of analytes as COPECs. See also Specific Comments #3.</p>	<p>The OU-1 Refined SLERA Tables 4-12a and 4-12b are provided for chemicals lacking ESVs. The range of regulatory guidance considered for ESVs was provided in Table 2-3 of the OU-1 Refined SLERA Report. Therefore, in this context, the frequency of detection is considered different than the context used for screening, as noted in Specific Comments 3, 11, and 14.</p> <p>Acknowledging the above, Revision 1 of the OU-1 Refined SLERA Report will include additional uncertainty discussion to indicate that the relatively low frequency of bromide is 9% which indicates that this constituent is not ubiquitous throughout the site and is not expected to contribute significantly to overall risk. As stated in previous comments, spatial plots will be provided for the constituents in this uncertainty discussion. Additionally, text will be added regarding the low toxicity of bromide to terrestrial birds and mammals (USEPA 2005). USEPA conducted a risk assessment for bromide and found that bromide is “practically non-toxic to avian species” with LC50s of > 5,600 mg/kg. USEPA reported LC50s based on oral toxicity to rats (as a surrogate for terrestrial mammals) as >3,900 mg/kg. The maximum concentrations of bromide within the Operations Area and Parcel E are 4.7 mg/kg and 15 mg/kg, respectively. As such, bromide is not expected to contribute to potential risk to birds and mammals that</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>

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	<p>may visit the Site.</p> <p>The following reference cited above will be added to the reference section of the OU-1 Refined SLERA Revision 1. USEPA 2005.</p> <p>Ecological Hazard and Environmental Risk Assessment of Bromine and Sodium Bromide for the Registration Eligibly Decision (RED) Document.</p>	
<p>26. Specific Comment #26: Table 4-12a and Table 4-12b</p> <p>Please explain why the site 95%UCL and average concentrations of chemicals in these tables are being compared to the 95%UCL and average background concentration for decision-making purposes instead of employing the same statistical tests for background that were used for other analytes. Comparison to UCLs in this way is inappropriate as there is absolutely no statistical justification for such a comparison.</p>	<p>As noted in the response to Specific Comment 25, the analysis provided in Tables 4-12a and 4-12b were provided as part of an uncertainty evaluation for COPECs for which there is no ESV. There is no definitive USEPA or NDEP guidance on how such chemicals are to be handled in an uncertainty analysis. As can be seen in the last columns Tables 4-12a and 4-12b, the 95%UCLs and average backgrounds were not used to exclude any chemicals, only to provide some additional understanding of the concentration ranges. Each of the chemicals included on Tables 4-12a and 4-12b are discussed further in Section 4.7 (the uncertainty assessment).</p> <p>The uncertainty analysis presented in Revision 1 of the OU-1 Refined SLERA Report for chemicals identified in Tables 4-12a and 4-12b will be expanded to include a discussion of the spatial overlap of these chemical detections with other chemicals at the Site.</p>	<p>Note that the same comment was made for the OU2 SLERA and the response is somewhat more comprehensive. EPA has previously made it clear that UCLs for site data and background data should not be compared directly. Consideration should be given to removing direct comparisons of UCLs, or, at the very least, some qualification is needed in terms of respective samples sizes. It is ok to compare means, but UCLs depend on sample size, in which case their comparison is not advisable. Note also that the spatial analysis could affect how risk estimates are calculated and compared (if any changes are made to exposure areas, etc.).</p>
<p>27. Specific Comment #27: Section 5, SLERA Conclusions</p> <p>As noted in comments above, the report states that general statements about risk to reptiles can be made. No such general statements about potential risk to reptiles are included in the Conclusions section. Please address accordingly.</p>	<p>General statements about the potential risks of chemicals in the Operations Area and Parcel E to reptiles will be added to the risk characterization and risk conclusion sections in Revision 1 of the OU-1 Refined SLERA Report.</p>	<p>This response is acceptable, pending review of the revised report.</p>

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<p>28. <u>Specific Comment #28: Appendix C, Summary of Soil Samples Removed from SLERA Dataset due to Remediation or Inaccessibility to Wildlife</u></p> <p>Location RSAJ7, sample RSAJ7-0.5B: Samples already removed during remediation are still in the BMI Regional Database (BMI DB) reported at the PQL. Table C-1 reports the non-detected concentrations at the SQL.</p>	<p>The stated reason for exclusion of sample RSAJ7-0.5B in Table C-1 is incorrect. The sample is still in place and should therefore remain in the BMI Regional Database.</p> <p>Table C-1 in Revision 1 of the OU-1 Refined SLERA Report will be updated to clarify that the sample was covered by a cement- treated aggregate during the 2011 Interim Soil Removal Action and is therefore inaccessible to wildlife.</p>	<p>This response is acceptable, pending review of the revised report.</p>
<p>29. <u>Specific Comment #29: Appendix D, Table D-1 Operations Area and Parcel E SLERA Dataset for Individual Chemical and Radionuclides</u></p> <p>The are several issues with mismatched data found in the Deliverable versus data as it was submitted to the BMI Regional Database in the form of EDDs. It is noted that Ramboll will not be able to correct many of these issues on their own without interfacing with NDEP, who maintains the database, and/or other entities who submitted the original EDDs. However, it is worth noting these issues in general here as specific examples that have been problematic in this and other reports. The following discrepancies were noted in comparing information in Table D-1 to the BMI Regional Database:</p> <ol style="list-style-type: none"> a. BDT-3-N-10 does not have results in the BMI Database; the rest of the sample ID may be missing in Table D-1. b. There are no data records in the BMI Regional DB for locations M-116 or SA-9. c. Multiple records are reported as “Nitrate/Nitrite: in Table D- 1, but the corresponding results in the BMI Regional Database are reports as “Nitrite as NO3”. The BMI Regional Database results for “Nitrate/Nitrite [as N]” are reported with different results. <ul style="list-style-type: none"> • Examples include sample: M-161D-0.5- 	<p>The detection limits are reported consistent with NDEP guidance; see response to Specific Comment #29e for additional explanation.</p> <p>Ramboll and NDEP collaborated extensively in 2020-2021 to provide consistency so that the data sets used in the human health and ecological risk assessments could be found in the BMI Regional Database when looking by sample ID and CAS ID. An explanation is provided below for each of the data points that are identified in this specific comment. Accordingly, we do not see any requirement to submit revised data to the BMI Regional Database or prepare any revisions to the OU-1 Refined SLERA Revision 1 data set based on this specific comment as justified through the following responses.</p> <p>Given the number of discrepancies discussed and for some ease in resolution, the NDEP comment bullets have been replaced by letters to ensure all issues are discussed:</p> <ol style="list-style-type: none"> a. BDT-3-N-10 is a location name in Table D-1, not a sample ID. While this location name can be found in the location_id column of the BMI Regional Database, analytical results for BDT-2-N-10 can be found in the BMI Regional Database by searching for the specific sample names BDT-3-N-10-4BPC and BDT-3-N-10- 4BPC_FD. The recommended modification to NDEP’s query of the BMI database 	<p>The suggested query update has resolved this comment. Other RTSs are acceptable in for Specific Comment #29.</p>

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20141203, M- 16D-0.5-20141209, RIDB-1-0.5-20170308, RIDB-2-0.5- 20170309, RIDB-3-0.5-20170310, RIDB-4-0.5-20170306, RIDB-5-0.5-20170311, RIDB-6-0.5- 20170225, RIDB-7-0.5-20170312

- Also note that the results in Table D-1 are reported with additional decimal places, and, in some cases, slight discrepancies. Sample M-161D-0.5-20141203 for “Nitrate/Nitrite” is reported as 57.57142857 in Table D-1 and reported as 59 mg/kg in the BMI Regional Database.

These discrepancies apply to samples from locations: M- 161D, M-162D, RIDB-1 to RIDB-7, RISB-1 to RISB-5, RISB-09 to RISB-14, RISB-39 to RISB-41, RISB-47 to RISB-48, RIT-1-01 to RIT-1-05, RIT-2-01 to RIT-2-05, RIT-3-01 to RIT-3-05

- d. Records are missing from the BMI Regional Database for the following locations
 - SA16-0.5, SA18-0.5, SA19-0.5, TSB-GJ-02-0, TSB-GJ-02-0-FD, TSB-GJ-03-0, TSB-GJ-04-0, TSB-GJ-05-0, TSB-GR-02-0, TSB-GR-02-0-FD for 1,2,3,4,6,7,8,9-Octachlorodibenzofuran
 - SA7-0.5, dioxin and furan data

- e. There are many records in the BMI Regional Database where results were reported at the PQL instead of the SQL, and Table D-1 results are reported at the SQL.

Example: Difference between Table D-1 and BMI DB, BMI DB reported at PQL, not SQL

Sample ID	Chemical Name	Table D-1	BMI DB
TSB-GJ-02-0	Dibenzofuran	0.034	0.34
TSB-GJ-02-0-FD	Dibenzofuran	0.035	0.35
TSB-GJ-03-0	Dibenzofuran	0.034	0.33
TSB-GJ-04-0	Dibenzofuran	0.036	0.36

should resolve this issue.

- b. The location names in the BMI Regional Database for M-116 and SA-9 are M116 and SA09, respectively. Due to variations in dashes and leading zeroes in location names over the history of the project, the analytical results can be found more easily by joining the specific sample names to the sample_id_field column in the BMI Regional Database, which are M116- 0.5_03/12/2006, M116-0.5R_03/24/2006, SA09-3BPC, SA09- 5BPC, and SA09-5BPC_FD for these two locations. The recommended modification to NDEP’s query of the BMI database should resolve this issue.
- c. Table C-2 indicates that Nitrate as N and Nitrate/Nitrite as N results were converted to the NO3 basis using a ratio of 4.43 (the molecular weight of NO3 divided by the molecular weight of N, or 62/14), and that Nitrite as N results were converted to the NO2 basis using a ratio of 3.29 (the molecular weight of NO2 divided by the molecular weight of N, or 46/14). The Table D-1 entries for “Nitrate/Nitrite” should be matched to the “Nitrate/Nitrite (as N)” results in the BMI Regional Database. For sample M-161D-0.5-20141203, the result of 13 mg/kg for Nitrate/Nitrite as N in the BMI Regional Database converts to 57.57 mg of NO3 per kg. This value is approximately equal to the Nitrate as NO3 value of 59 in the BMI Regional Database because the Nitrite as N result is a non-detect. The slight discrepancy between the converted Nitrate/Nitrite value and the Nitrate as NO3 value is due to analytical reporting of two significant figures (59 mg of NO3 is equivalent to 13.32 mg of N, which the analytical laboratory rounded down to 13 mg/kg as N).
- d. The 1,2,3,4,6,7,8,9-Octachlorodibenzofuran records for the samples listed can be found in the

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TSB-GJ-05-0	Dibenzofuran	0.034	0.3
TSBGR-02-0	Dibenzofuran	0.034	0.34
TSBGR-02-0-FD	Dibenzofuran	0.03	0.35

- f. There are differences in CAS IDs between Table D-1 and the BMI DB. Examples are provided in the bullets
- The 2,3,4,7,8-Pentachlorodibenzofuran results are reported under CAS ID 57117-31-4 in Table D-1, but 57117-44-9 in Regional BMI Database. The results are correct. Locations BDT-2 and BDT-3 are examples of this.
 - Chlorate has CAS ID 14866-68-3 in Table D-1 and 7790- 93-4 in the BMI Regional Database. Sample M-161D-0.5- 20141203 is an example of this.
 - m,p-xylene has CAS ID 179601-23-1 in Table D-1 and 136777-61-2 in the BMI Regional Database. Sample TSB-GJ-03-0 is an example of this.

Please submit data to the Regional Database to correct the missing data and mismatched report values. A list of NDEP- approved DVSR IDs containing the missing data would be helpful for tracking down these discrepancies.

BMI Regional Database using the value ‘OCDF’ in the column cas_id_raw. The cas_id column in the BMI Regional Database for these results was set to 3268- 87-9 because the record was initially submitted by Tronox with the incorrect analyte_name_raw of 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin. The analyte_name and cas_id columns should be fixed in the BMI Regional Database for these records. The actual 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin records for these samples can be found using the value ‘OCDD’ in the cas_id and cas_id_raw columns, not the value 3268-87-9 as presented in Table D-1. Rows will be added to Table C-2 to indicate that these CAS IDs have been standardized. While the 1,2,3,4,6,7,8,9-Octachlorodibenzofuran and 1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin records for sample SA7-0.5 also need standardization in this manner, the rest of the dioxin and furan data for this sample can be found in the BMI Regional Database. The recommended modification to NDEP’s query of the BMI database should resolve this issue.

- e. Ramboll and NDEP collaborated significantly in 2020-2021 to resolve detection limit column discrepancies. Due to various complications with data already in the BMI Regional Database at the time involving historical data validation guidance regarding blank contamination, it was agreed that, to avoid possible inadvertent data erasure, the reported result column would not be updated en masse to report non-detects to the SQL, given that the SQL is correct in the BMI database in a separate column. It is consistent with current NDEP guidance to report non-detects to the SQL, which is how Table D-1 is reported, as noted in the comment.
- f. The differences can be explained as follows:

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	<ul style="list-style-type: none"> • CAS ID 57117-44-9 is not the correct CAS ID for 2,3,4,7,8-Pentachlorodibenzofuran; that CAS ID refers to 1,2,3,6,7,8-Hexachlorodibenzofuran. This was corrected in the BMI Regional Database during the collaboration between Ramboll and NDEP by changing the cas_id column in the BMI Regional Database. The column cas_id_raw was left as-is because that is how the historical data were submitted, but the error was fixed in Table D-1. To correct this, the BMI Regional Database could be updated to put 57117-31-4 in the cas_id_raw column where 57117-31-4 is already in the cas_id column. • CAS ID 7790-93-4 is not the correct CAS ID for chlorate; that CAS ID refers to chloric acid, which is not routinely analyzed. The BMI Regional Database could be updated to set the cas_id column to 14866-68-3 wherever analyte_name_raw is chlorate. Note that some results in the BMI Regional Database have a blank analyte_name column when the analyte_name_raw column is filled in with 'Chlorate'; this could also be corrected. A row will be added to Table D-1 to indicate that this CAS ID has been standardized. <p>CAS ID 136777-61-2 is not the correct CAS ID for m,p- xylene; that CAS ID refers to the o,p-xylene mixture, which is not routinely analyzed. The correct CAS ID for m,p- xylene is 179601-23-1. A row will be added to Table C-2 to indicate that this CAS ID has been standardized.</p>	
<p>30. <u>Specific Comment #30: Table E-1, BRC Background Data Set</u> Phosphorous data was not found in the BMI</p>	<p>The BRC/TIMET Background Data Set was obtained directly from NDEP via email on January 2020 in</p>	<p>This response is acceptable. The phosphorus data is in the</p>

NDEP Comment	Response	NDEP Comment on Response
<p>DB for these locations. Please submit data to the BMI Regional Database for this background data.</p>	<p>essentially the same format as presented in Table E-1. It was also reported in the Soil Background Data Set Summary Report which was approved by NDEP on April 12, 2021. The DVSR ID in the BMI Regional Database for these data appears to be “BRC_34”. There is insufficient information in the data set in NERT’s possession to submit to the BMI Regional Database (e.g., there is a lack of sample and analysis dates) as this is not NERT’s data. Please contact BRC for additional information and/or a new data submission. If additional data or information becomes available from BRC, NERT would appreciate receiving a copy of the additional data or information.</p>	<p>Soil Background Dataset Summary Report from 2021. NDEP can investigate further why the phosphorus data did not get included in the database upload for DVSR BRC_34.</p>
<p>31. <u>Specific Comment #31: Table F1, Summary of 95% UCLs for Constituents Retained for Refined Screening by Spatial Unit</u></p> <p>The values in the ‘# Samples’ and ‘# Detects’ columns are switched. Please correct this.</p>	<p>The column headers for # Samples and # Detects will be corrected in Table F1 (Appendix F) of the OU-1 Refined SLERA Report, Revision 1.</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>
<p>32. <u>Specific Comment #32: Appendix I, Tables I1 through I5</u> These tables present two sets of NOAEL and LOAEL HQ calculations, one set for AUF=1 and one set for AUF <= 1. For the column entitled AUF<=1, please put in the actual AUF used in the calculation. This applies to mainly tables showing results for Coopers Hawk, Kit Fox, Fringed Myotis, Raccoon, and Mourning Dove, which obviously use AUFs<1 in the final two columns. Also, the term AUF in Appendix I and throughout the text is inconsistent with the terminology in the Appendix H exposure parameter tables, which use the term site foraging frequency (SFF). All SFF values in the exposure parameter tables show SFF=1, so the SFF (or AUF) values <1 used to calculate HQs in DU1, DU2, DU3, and Parcel E for the above referenced receptors are never defined. Please revise accordingly.</p>	<p>Revision 1 of the OU-1 SLERA Report will include updates to Tables I1 though I5 to include the AUF values used for the tables in the column headers. Please also see the response to Specific Comment 22 which also pertains to AUFs.</p> <p>As noted in the response to Specific Comment 22, the terminology AUF will be consistently used, the term SFF will be omitted, and Table 4-7a will be updated to show the AUFs for each of the Ecological areas (Operations Area, Ecological DUs 1, 2, and 3, and Parcel E).</p>	<p>The proposed revisions are acceptable, pending review of the revised report.</p>