



NEVADA DIVISION OF  
**ENVIRONMENTAL  
PROTECTION**

**STATE OF NEVADA**  
Department of Conservation & Natural Resources

Steve Sisolak, Governor  
Bradley Crowell, Director  
Greg Lovato, Administrator

March 2, 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: *Refined Screening-Level  
Ecological Risk Assessment for Operable Unit 1*

Dated: August 6, 2021

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 **05/02/2022** 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](mailto: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:  
Jeffrey Kinder, Deputy Administrator NDEP  
Frederick Perdomo, Deputy Administrator NDEP  
James Dotchin, NDEP BISC Las Vegas  
Carlton Parker, NDEP BISC Las Vegas  
Alan Pineda, NDEP BISC Las Vegas  
Allan Delorme, Ramboll Environ  
Andrew Barnes, Geosyntec  
Andrew Steinberg, Nevada Environmental Response Trust  
Anna Springsteen, Neptune & Company Inc.

Betty Kuo Brinton, Metropolitan Water District of Southern California  
Brian Waggle, Hargis + Associates  
Brian Loffman, Nevada Environmental Response Trust  
Brian Rakvica, Syngenta  
Carol Nagai, Metropolitan Water District of Southern California  
Chris Ritchie, Ramboll Environ  
Christine Klimek, City of Henderson  
Chuck Elmendorf, Stauffer Management Company, LLC  
Dan Pastor, P.E. TetraTech  
Dane Grimshaw, Olin  
Dave Share, Olin  
Dave Johnson, LVVWD  
Derek Amidon, TetraTech  
Ebrahim Juma, Clean Water Team  
Ed Modiano, de maximis, inc.  
Eric Fordham, GeoPentech  
Gary Carter, Endeavour  
Greg Kodweis, SNWA  
Jill Teraoka, Metropolitan Water District of Southern California  
Joanne Otani, The Fehling Group  
Joe Kelly, Montrose Chemical Corporation of CA  
Joe Leedy, Clean Water Team  
John Edgcomb, Edgcomb Law Group  
John Pekala, Ramboll Environ  
John Solvie, Clark County Water Quality  
Kathrine Callaway, Cap-AZ  
Kelly McIntosh, GEI Consultants  
Kirk Stowers, Broadbent & Associates  
Kirsten Lockhart, Neptune & Company Inc.  
Kim Kuwabara, Ramboll Environ  
Kurt Fehling, The Fehling Group  
Lee Farris, BRC  
Marcia Scully, Metropolitan Water District of Southern California  
Maria Lopez, Metropolitan Water District of Southern California  
Mark Duffy, U.S. Environmental Protection Agency, Region 9  
Mark Paris, Landwell  
Mauricio Santos, Metropolitan Water District of Southern California  
Melanie Hanks, Olin  
Michael J. Bogle, Womble Carlyle Sandridge & Rice, LLP  
Michael Long, Hargis +  
Mickey Chaudhuri, Metropolitan Water District of Southern California  
Nicholas Pogoncheff, PES Environmental, Inc.  
Nicole Moutoux, U.S. Environmental Protection Agency, Region 9  
Orestes Morfin, CA  
Paul Black, Neptune & Company  
Peggy Roefer, CRC

Peter Jacobson, Syngenta  
Ranajit Sahu, BRC  
Rebecca Sugerman, U.S. Environmental Protection Agency, Region 9  
Richard Pfarrer, TIMET  
Rick Kellogg, BRC  
R9LandSubmit@EPA.gov  
Steve Clough, Nevada Environmental Response Trust  
Steven Anderson, LVVWD  
Steve Armann, U.S. Environmental Protection Agency, Region 9  
Tanya O'Neill, Foley & Lardner L  
Todd Tietjen, SNWA  
William Frier, U.S. Environmental Protection Agency, Region 9

## Attachment

### Overall Comments

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.

### Essential Corrections

#### Specific Comment #1 Lack of Spatial Plots

There are no spatial plots in the report for any chemical, let alone the 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 a 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 *de facto* requirement of NDEP on all risk assessment reports in the past and must be included here.

#### Specific Comment #2 Background Comparisons

There is insufficient discussion of the background comparisons. The Gilbert's Toolbox results presented in Table E-2b include many  $p$ -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 are 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 McCullough background on which background comparisons are performed. At the very least, some acknowledgement and discussion of the reasons why this might occur is warranted.

#### Specific Comment #3 Section 3.2.1.2, p. 3-2, Tier 2 Screening.

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 represents 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 page 3-3 is needed before they can be eliminated

on the basis of low frequency of detect. This comment applies to application of the low frequency of detection criteria to individual DUs as well.

#### **Specific Comment #4 Appendices C and D**

There are 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.

#### **Specific Comment #5 Appendix E**

There is insufficient discussion of the background comparisons. The Gilbert's Toolbox results presented in Table E-2b include many *p*-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 concentrations 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 McCullough background on which background comparisons are performed. At the very least, some acknowledgement and discussion of the reasons why this might occur is warranted.

#### **Specific Comment #6 Executive Summary, p. ES-2**

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 this 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.

#### **Specific Comment # 7      Section 1**

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 conclusions sections of this document.

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.”

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. Did any of the subsequent site visits result in different biological/ecological findings than the first?

The conclusions of the report in Section 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.

**Specific Comment #8                      Section 1, p. 1-3, Introduction**

Please add the size of each of the Eco DUs and Parcel E to the description of those areas.

**Specific Comment #9                      Section 2.1.4, p. 2-7, Exposure Media**

Please add rooted plants to the list of receptors that have exposure to soil greater than 1-foot in depth.

**Specific Comment #10                      Section 2.1.5, p. 2-8, Preliminary Chemicals of Potential Concern**

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.

**Specific Comment #11                      Section 2.1.5, p. 2-8, Preliminary Chemicals of Potential Concern**

Please add text to the second bullet to clarify that 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.

**Specific Comment #12                      Section 2.1.5.1, p. 2-9, Data Used in the SLERA**

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.

**Specific Comment #13            Section 2.1.5.1, p. 2-10, Data Used in the SLERA**

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 sum of DDT, DDE, and DDD. See also the first paragraph on Page 2-11.

**Specific Comment #14            Section 2.1.5.1, p. 2-11, Data Used in the SLERA**

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.

**Specific Comment #15            Section 2.1.6. p. 2-14. Potentially Exposed Receptors, and Figure 2-4, CSM**

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.

**Specific Comment #16            Section 2.1.7, p. 2-15. Exposure Pathways, and Figure 2-5**

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.

**Specific Comment #17            Section 2.1.8, p. 2-17. Assessment Endpoint**

The first full paragraph on the page should reference birds, mammals, and reptiles, not just birds and mammals.

**Specific Comment #18            Section 2.2, p. 2-18, Screening Level Effect Evaluation and elsewhere in document**

The Los Alamos National Library EcoRisk Database has an updated version (v4.2) as of November 2020. Please update where relevant. It may be found here and is now cited as N3B 2020:

[https://www.intellusnm.com/documents/document-library.cfc?method=retrieveLanlFile&nodeId=62152\](https://www.intellusnm.com/documents/document-library.cfc?method=retrieveLanlFile&nodeId=62152)

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)

**Specific Comment #19      Section 3.2.1.1, p. 3-3, Tier 1 Screening Results**

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.

**Specific Comment #20      Section 3.2.1.2, pp. 3-4 to 3-5, Tier 2 Screening Results**

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 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.

**Specific Comment #21      Section 4.4.3, p. 4-10, Refined Risk Calculations**

The use of RSVs 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.

**Specific Comment #22      Section 4.5.2.4, p. 4-23, and Appendix H**

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.

**Specific Comment #23      Section 4.7, p. 4-43, and Table 4-11**

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. 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.



**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.

**Specific Comment #25      Table 4-12a and Table 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**.

**Specific Comment #26      Table 4-12a and Table 4-12b**

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.

**Specific Comment #27      Section 5, SLERA Conclusions**

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.

**Specific Comment #28 Appendix C. Summary of Soil Samples Removed from SLERA Dataset due to Remediation or Inaccessibility to Wildlife**

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.

**Specific Comment #29 Appendix D, Table D-1 Operations Area and Parcel E SLERA Dataset for Individual Chemicals and Radionuclides**

There 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 Neptune, 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:

- 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.
- There are no data records in the BMI Regional DB for locations M-116 or SA-9.
- Multiple records are reported as “Nitrate/Nitrite” in Table D-1, but the corresponding results in the BMI Regional Database are reported as “Nitrate as NO3”. The BMI Regional Database results for “Nitrate/Nitrite [as N]” are reported with different results.
  - Examples include samples: M-161D-0.5-20141203, M-162D-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. Sample M-162D-0.5-20141209 for “Nitrate/Nitrite” is reported as 23.91428571 in Table D-1 and reported as 24 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.
- 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
- 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-GJ03-0	Dibenzofuran	0.034	0.33
TSB-GJ-04-0	Dibenzofuran	0.036	0.36
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

- 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 the 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 reported result values. A list of NDEP-approved DVSR IDs containing the missing data would be helpful for tracking down these discrepancies.

**Specific Comment #30                      Table E-1, BRC Background Data Set**

Phosphorus data was not found in the BMI DB for these locations. Please submit data to the BMI Regional Database for this background data.

**Specific Comment #31                      Table F-1, Summary of 95% UCLs for Constituents Retained for Refined Screening by Spatial Unit**

The values in the ‘# Samples’ and ‘#Detects’ columns are switched. Please correct this.

**Specific Comment #32                      Appendix I, Tables I1 through I5**

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 mainly to 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.