



NEVADA DIVISION OF
**ENVIRONMENTAL
PROTECTION**

STATE OF NEVADA
Department of Conservation & Natural Resources

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

October 13, 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: *Baseline Health Risk Assessment for Ou-2 Soil Gas and Groundwater and OU-1 and OU-2 Soil Gas and Groundwater Modification #1 Technical Memorandum*

Dated: July 23, 2021, and August 29, 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 **12/14/2022** 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,

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

WD:cp

EC:

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James Dotchin, NDEP BISC Las Vegas
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Attachment A

General Comment #1 Tables

In reviewing the tables, the Department could not reconcile many of the data tables. Primarily between tables 4-8 and 4-9 and those in appendix H; primarily H-4, H-5, and H-6. For example, the maximum concentration of 1,1,1,2-tetrachloroethane provided in Table H-4 is 3.03E-09 (note: there are also no units in Appendix H tables) as opposed to that of 0.065 $\mu\text{g}/\text{m}^3$ listed in Table 4-8. In addition, there are several chemicals that do not appear across all tables. For example, Freon 113 is listed as a detected analyte in Table H-4 but not in Table 4-8. Please double check each table and cross reference to be sure all chemicals and concentrations are properly reported.

General Comment #2 OU-1 and OU-2 Soil Gas and Groundwater Modification #1 Technical Memorandum

It is good to see that the indoor air sampling results are within the uncertainty range of the J&E modeling results. However, NDEP understands that the results from the J&E model generally carry some uncertainty that is dependent on the conceptual site model, the inputs to the model and the assumptions for applying the model, so the NDEP will remain cognizant of these issues with the J&E moving forward.

General Comment #3 OU-1 and OU-2 Soil Gas and Groundwater Modification #1 Technical Memorandum: Section of Chloroform Indoor Air and Soil Gas Sampling Results and Evaluation

“Since the J&E model does not account for indoor or ambient sources of chloroform, the range of predicted indoor air concentrations for each house was calculated by adding the range of chloroform concentrations found in the indoor air of background area houses to the modeled indoor air concentrations.” NDEP asks for more details about this statement.

Specific Comment #1 Executive Summary, last paragraph, p. ES-6.

The statement:

“In summary, potential exposure to VOCs in soil gas and shallow groundwater in the OU-2 BHRA Area through the vapor intrusion pathway does not pose unacceptable carcinogenic and noncarcinogenic human health risks...”

should be modified to the effect of

“In summary, potential carcinogenic and noncarcinogenic human health risks due to exposure to VOCs in soil gas and shallow groundwater in the OU-2 BHRA Area are within the NDEP and USEPA risk range of 10^{-6} to 10^{-4} .”

In fact, the ILCR range of 10^{-6} to 10^{-4} is the ‘risk management range’ and not an “acceptable” risk range. Statements to the effect of designating or determine what is or is not “acceptable risk” should not be in a health risk assessment. Rather, HRAs, should quantify the potential risk but the

determination of acceptable risk is the purview of the risk managers and other interested stakeholders and should not be part of the HRA.

Specific Comment #2 Section 4.1.1

Unless incorrect, we recommend that the statement in the ‘Groundwater’ section on page 4-2 highlighted in the clip below be reworded to read “All wells with the top of the screen shallower than 60 feet bgs were included in this BHRA as they were deemed to provide the most representative data for the vapor intrusion models.” or something similar.

Groundwater

Consistent with USEPA’s most recent vapor intrusion guidance (USEPA 2015), shallow groundwater data were incorporated in this BHRA to provide a secondary line of evidence for the vapor intrusion risk analysis. All wells with the top of the screen shallower than 60 feet bgs were conservatively included in this BHRA for better spatial coverage. The monitoring wells from which groundwater samples were analyzed for VOCs and included in the BHRA data set are presented in Table 4-4.

The point is that it’s not conservative to take this approach but, rather, the approach is appropriate and consistent with the conceptual models on which the vapor intrusion models are based. That said, the NDEP appreciates the first paragraph at the top of page 4-3 that acknowledges issues with the screened intervals of some wells and the subsequent discussion in the uncertainty analysis section of the BHRA.

Specific Comment #3 Section 4.2.3

Rather than focus only on chloroform, inclusion of other analytes may be worth considering.

Specific Comment #4 Section 4.2.4, first paragraph

At the end of the first paragraph, what does “Only the shallow groundwater samples most representative for characterizing representative vapor source concentrations for vapor intrusion assessment were included in the analysis” mean? Is this another way of saying only collocated groundwater samples were used, or does it mean only certain data from collocated wells were used, and if so, how was the data point chosen to be the ‘most representative’? In addition, is there really greater variability at lower concentrations??

Specific Comment #5 Section 4.2.4

First paragraph on page 4-11: In risk assessment parlance, groundwater is not a source of contamination – it is a transport and exposure medium. Please revise accordingly.

Specific Comment #6 Section 4.2.5

There is no discussion of the OU-1 sources here – only OSSM and TIMET. There are known potential NERT sources of chloroform on OU-1 referenced, but only details about OSSM and TIMET. Please revise accordingly.

Specific Comment #7 Section 5.2.2

On page 5-7, a trailer scenario is described but it is unclear how the J&E model was configured to simulate this. The same concern applies to the construction worker scenario. Provide the electronic spreadsheets for the vapor intrusion models (including the J&E and BioVapor models) as a separate appendix.

Specific Comment #8 Section 5.4.1

Regarding the footnote on page 5-12: Are UCLs appropriate for this BHRA? That is, given the existence of paleochannels noted in other reports related to the area, would sample-specific risk values be more appropriate?

Further and of greater concern, though, is an apparent lack of an adequate statistical presentation of the data. Assuming NERT has used Neptune's UCL R code, it should be pointed out that this code should be used on iid data (independent and identically distributed). Some deviation from this assumption can be tolerated, and usually is (by default), but in this case there is obvious spatial correlation in the data, and there are temporal issues if data from all 3 sampling events are used (probability weighting should be used). That is, the UCLs should accommodate both spatial correlation and temporal location overweighting.

Specific Comment #9 Section 6.2.2.3

Table 5-3 lists mean, minimum, maximum, and median values for soil properties. Which values were used in the models? Was it the mean, median, or something else?

Specific Comment #10 Section 6.2.2.3

The sample collected at approximately 10 ft bgs at RISG7 is supersaturated. That is, the water-filled porosity reported by the laboratory (0.546) exceeds the total porosity (0.423). These values are expected to be equal (or very nearly so) for a fully saturated sample. The significantly higher water-filled porosity compared to the total porosity renders the moisture value unusable. Strictly speaking, it was not 'conservative' to exclude this sample from the modeling effort as stated in the report – rather, it was the appropriate thing to do from a data usability standpoint.

Specific Comment #11 Figures

Figure 4-2 (and similar) is also difficult to follow. Although the quartiles are provided, one has to continually go from figure to colors to numeric breakdown. Bubble plots would make this easier (or intensity plots with a color scale). Please consider for future deliverables.

Specific Comment #16 Appendix A

It is not clear what the basis is of the estimated zone of influence for soil gas samples for this appendix. Please elaborate.