NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Brian Sandoval, Governor
Bradley Crowell, Director
Greg Lovato, Administrator

April 6, 2018

Jay A. Steinberg
Nevada Environmental Response Trust
35 East Wacker Drive, Suite 1550
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: *In-Situ Chromium Treatability Study Results Report*

Dated: March 22, 2018

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 06/22/2018** 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 702-486-2850 x252.

Sincerely,

Dong

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

WD:cp

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Alison Fong, U.S. Environmental Protection Agency, Region 9
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David Parker, Central Arizona Water Conservation District
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Steven Anderson, LVVWD
Tanya O'Neill, Foley & Lardner L
Todd Tietjen, SNWA

Attachment A

1. Section 1.2.2 Chemical Reduction Study Area, Page 7. Low hexavalent chromium concentration in the groundwater and dewatered alluvial aquifer of the AP flushing treatability study area make the site not a good candidate for conducting field chemical reduction study. Consider that three of six baseline wells have the hexavalent chromium concentration below the level of the reported sample quantitation limit and 3 wells went dry (see Table 26), which leads one to an unreliable conclusion about the results from the field chemical reduction study. NDEP requires an explanation why the field chemical reduction study was executed with known information that the site is not good candidate for the proposed study.

2. Section 3.3.2.1 Column Setup and Effectiveness Monitoring, Page 15. The packed soil columns from the cuttings produced during drilling were used for the laboratory column study. Because the packed column doesn't have original soil textures, porosities and vertical heterogeneity, the results from the packed column are difficult to be applied to the field study. NDEP suggests that the undisturbed cores should be collected for future laboratory column study when they are obtainable. Cross-sections of Figures 3b, 3c, 4b, 4c and 4d were obviously oversimplified, the geology is more complicated than depicted. Because many borings were drilled in these two small areas, NDEP requires better represented cross-sections that reflects lateral and vertical heterogeneity in both sites, consider using a stratigraphic approach, or facies groupings.

3. Figure 5a Groundwater Contours and Flow Direction—Shallow Wells. It is obvious that the substrate injected from the injection wells is likely not moving into monitoring wells of CTMW-03S/D. It is project manager's professional call that at least one additional injection well should be added to upper gradient area of CTMW-03S/D. This comment is also related to Comment 2 above. If detailed cross-sections were constructed, they will be very useful to locate right injection wells and to explain the observations. NDEP requires that proposed monitoring and injection wells in the approved workplan should be revisited after the site characterization completed in all on-going treatability studies or future treatability studies.

4. Table 1 Baseline Soil and Depth-Discrete Groundwater Sampling Protocol listed "Purpose" for each parameter, but most purposes were not discussed in the report. NDEP requires that all purposes listed in this table be discussed in the result section.

5. Sections 4.1.5 and 4.2.5 Injections. Please provide a calculation how the volume of injected substrates and calcium polysulfide was determined.

6. Table 4 Hexavalent Chromium Groundwater Results in Shallow Wells—Biological Reduction Study, Page 33. No reduced hexavalent chromium was observed in CTMW-03S. This may be explained with inappropriate location of the injection wells. However, this observation is in confliction with TOC (Table-6), Dissolved Oxygen (Table 18), Oxidation-Reduction Potential (ORP) (Table 20) and Total Biomass (Table 23) observed. NDEP asks an explanation for this conflicted observation.

7. Section 5.1.2.8 Metals, Pages 49, 50. "increases in arsenic concentrations in groundwater that have the potential to be outside of natural fluctuation were observed at CTMW-01S, CTMW-02S, CTMW-04S, and CTMW-05S when compared to baseline concentrations", "Arsenic concentrations in deep monitoring wells fluctuated in response to geochemical conditions in the aquifer during performance monitoring. At the end of performance monitoring, increases in arsenic concentrations that have the potential to be outside of natural fluctuation were observed in groundwater at CTMW-02D, CTMW-04D, CTMW-05D, and CTMW-06D when compared to baseline concentrations, with the highest concentration of 0.130 mg/L in groundwater at CTMW-05D" and "Arsenic, barium, iron and manganese concentrations in the effluent samples gradually increased" of Appendix A, Page 175. Although the arsenic concentrations tend to return pre-injection of substrate once the reduced condition of groundwater is gone, this will be an issue for a long-term and full-scale in-situ bioremediation. NERT has multiple on-going in-situ bioremediation treatability sites. NDEP suggests that NERT pay more attentions on increase of groundwater arsenic in the in-situ bioremediation.

8. Section 6.3 Cost Considerations For Implantations, Page 70. NDEP wants to clarify two things here. First, One of the objectives in the approved work plan states "Estimate preliminary costs for full-scale implementation, if the field test is effective"; Second, Guide for Conducting Treatability Studies Under CERCLA (EPA, 1989) does include Appendix—Cost Elements Associated with Treatability Studies. NDEP asks the cost for major items for this treatability study. Some examples for the major items may include the price and total cost for substrates and chemicals investigated, the cost for injection of substrate and chemicals, the cost for monitoring wells, injection wells installations, soil borings, aquifer tests, soil, groundwater sampling and chemical analysis, the cost for effectiveness monitoring, and the total cost for labor and professional service required by the treatability study. This information will lay out sound base for the feasibility study. The cost for full-scale implementation of the treatability study is optional for the treatability study report. This comment applies to all on-going and future treatability studies.