



NEVADA DIVISION OF  
**ENVIRONMENTAL  
PROTECTION**

STATE OF NEVADA  
Department of Conservation & Natural Resources

Joe Lombardo, Governor  
James A. Settelmeyer, Director  
Jennifer Carr, Administrator

March 5, 2024

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 Property  
NDEP Facility ID #H-000539**  
Nevada Division of Environmental Protection (NDEP) Response to: *Semi-Annual  
Groundwater Monitoring and GWETS Performance Memorandum, July – December  
2022 Performance Period*

Dated: December 27, 2023

Dear Mr. Steinberg,

The NDEP has reviewed the above-identified Deliverable and provides comments in Attachment A. A revised Deliverable addressing the comments outlined in Attachment A should be submitted by **May 5, 2024**. 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 [alan.pineda@ndep.nv.gov](mailto:alan.pineda@ndep.nv.gov) or 702-668-3925.

Sincerely,

Alan Pineda, P.E.  
Bureau of Industrial Site Cleanup  
NDEP-Las Vegas City Office

EC:

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Esther Franco, NDEP BISC Las Vegas  
Adam Schwartz, Central Arizona Project  
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William Frier, U.S. Environmental Protection Agency, Region 9  
Zeitel Senitz, de maximis, inc.

## Attachment A

1. **General Comment** – The Performance Memorandum does not include evaluation of observed groundwater elevations to demonstrate capture. NDEP recommends that the evaluation of groundwater elevations be included as a line of evidence, consistent with EPA guidance: *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems* (USEPA, 2008) list of recommended steps for completing capture zone evaluations.
2. **Essential Correction #1, Section 2.2, Page 6, first bullet** – It is stated that the alluvium has largely been dewatered and the IWF is operating at its maximum sustainable pumping rate. As was identified in the AWF, is the reduced pumping rate for the IWF due to dewatering of the alluvium? If so, can observed groundwater elevations be used to show that the water level near the IWF has decreased, supporting that the reduction in pumping rate may be due to a decrease in the surrounding groundwater elevations?
3. **Essential Correction #2, Section 3.2.1, Page 15, figure** – The caption of the figure states that the chart shows the "monthly total chromium removed by the IWF, AWF, SWF, and AP." However, only the AWF and IWF are shown, the other two well fields should be added.
4. **Essential Correction #3, Section 3.2.3, Page 21, first paragraph** – The capture analysis appears to be solely based on output from the Phase 6 Model. NDEP provided comments regarding the Phase 6 Model, dated July 22, 2020, and additional comments on proposed updates for the Phase 7 Model were provided on October 16, 2023, that recommended modifications for the Phase 7 Model to improve the ability of the model to represent observed groundwater flow and contaminant transport conditions. The Performance Memorandum states that the Phase 7 Model, once completed, will be used to evaluate/calculate the performance metrics to evaluate the effectiveness of the groundwater extraction systems at the Site.

To predict capture, the Phase 6 Model was updated with extraction rates from the performance period, July through December 2022, where data was available. Where rates were not available for the performance period, such as the TIMET wells, assumptions were made regarding the rates based on previous years data. Total pumping rates from the third and fourth quarter 2021 were used for Titanium Metals Corporation (TIMET) extraction wells. Well specific pumping rates were not available for the TIMET extraction wells; therefore, the total pumping rate was distributed to the individual wells based on the distribution of individual extraction rates presented by TIMET for third and fourth quarter 2020. The Performance Memorandum does not state that the Phase 6 Model was updated to match observed water levels from July through December 2022. To predict capture for the period from July through December 2022 it must be demonstrated that the Phase 6 Model represents observed water levels for the same time period. Given that the Phase 6 Model required an update as described in NDEP comment letters noted above, and that it is not demonstrated that the Phase 6 Model provides a reasonable calibration to water levels observed during the performance period, the Phase 6 Model should not be the only method applied and relied on for the capture zone evaluation.

Field data should be used as a first step to evaluate capture and can be complemented by the model results. The United States Environmental Protection Agency's (USEPA's) *A Systematic*

*Approach for Evaluation of Capture Zones at Pump and Treat Systems* (USEPA, 2008) lists recommended steps for completing capture zone evaluations.

5. **Essential Correction #4, Section 3.2.5.1, Page 26, end of second paragraph** – It is mentioned that of the 7 lbs/day of uncaptured perchlorate mass flowing through the OU2/OU3 boundary, 2 lbs/day are being destroyed by the Bioremediation Treatability Study area. It should be noted that as the Bioremediation Study was terminated in December 2022, this amount of perchlorate mass will no longer be destroyed and could potentially discharge to the Wash.
6. **Essential Correction #5, Section 3.2.5.2, Page 27, second paragraph** – Vertical flow rates are estimated from the Phase 6 Model. NDEP's July 22, 2020 comments on the Phase 6 Model identified that observed vertical hydraulic gradients are not well matched by the Phase 6 Model. NERT has proposed that a general head boundary condition be applied in the Phase 7 Model (as opposed to a no-flow boundary condition in the Phase 6 Model) to improve the ability of the Phase 7 Model to better represent observed vertical hydraulic gradients. On October 16, 2023, NDEP provided supplementary comments on NERT's proposed updates for the Phase 7 Model, which recommended that a specified flux be applied at the bottom of the Phase 7 Model that is based on observed vertical hydraulic gradients. As such, observed groundwater elevations should be used as the first line of evidence to evaluate vertical gradients and subsequently vertical flows and vertical fluxes.
7. **Essential Correction #6, Section 3.2.6.2, Page 33, last paragraph** – The groundwater flux rates and mass loading rates to the Las Vegas Wash are "difficult to reconcile" in part because the groundwater flux rates appear to be based on model results, and the mass loading rates appear to be based on field data. This should be highlighted in the text. This is an example of why field data are necessary to validate model results.
8. **Minor Correction #1, Section 3.2.1 2<sup>nd</sup> last paragraph on Page 14** – The last sentence of the paragraph reads "The decrease in total mass removal is due to reduced extraction rates (as a result of dewatering the alluvium) and perchlorate concentrations in extracted groundwater, as discussed in Section 2.5." Should it read "The decrease in total mass removal is due to reduced extraction rates (as a result of dewatering the alluvium) and **decreased** perchlorate concentrations in extracted groundwater, as discussed in Section 2.5."?
9. **Minor Correction #2, Section 3.2.3 Note for Table on Page 19** – The meaning of the note for the table appears misleading. Instead of stating that "NERT's COPCs are administratively limited to perchlorate and chlorate in OU-2 and OU-3 east of Pabco Road", it should read "NERT's COPCs in OU-2 and OU-3 east of Pabco Road are administratively limited to perchlorate and chlorate."