NEVADA DIVISION OF
ENVIRONMENTAL PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Brian Sandoval, Governor
Leo M. Drozdoff, P.E., Director
David Emme, Administrator

February 19, 2016

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: *NEVADA ENVIRONMENTAL RESPONSE TRUST CONTINUOUS OPTIMIZATION PROGRAM 2015 ANNUAL SUMMARY REPORT*

Dated: January 25, 2016

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and finds that the document is acceptable with the following comments noted for the Administrative Record:

1. "The objective of the COP is to optimize the current groundwater extraction and treatment system (GWETS) to utilize excess treatment capacity available, and at the direction of the NDEP and EPA, increase perchlorate mass removal from the environment." GWETS consists of three well fields (Intercept Well Field (IWF), Athens Well Field (AWF) and Seep Well Field (SWF)), five front-stage fluidized bed reactors (FBRs), GW-11 Pond, Groundwater Treatment Plant (GWTP) or chromium treatment plant and convey pipelines and lift stations for influent and effluent. Table 1 below includes historic data of some operation parameters. The system is able to remove much more perchlorate mass and three well fields are capable of producing much more flow when compared to 2015. Partial dewatering of IWF and AWF while perchlorate concentration decrease due to over a decade pump and treat operation is major factor to contribute the change. However, there is still significant perchlorate mass sitting in the groundwater within the NERT perchlorate plume area. The COP is designed to optimize the current GWETS and to increase perchlorate mass removal from the environment. The NERT made significant hydrogeological investigation and evaluation for the area from IWF to AWF and recommended extraction flow rate for AWF. NDEP is in agreement with the COP recommended AWF extraction rate after our analysis of the aquifer test and

the well construction information. NDEP makes additional comments on the COP summary report:

a. If the SWF extraction rate will be adjusted down at the same time as the AWF flow increase due to the GWETS hydraulic loading capacity, the NERT should consider monitoring the perchlorate concentration and mass loading of surface water in the Las Vegas Wash until no significant perchlorate change is confirmed;
b. If the SWF extraction rate is adjusted, the adjustment should be based on maximizing the perchlorate mass removal with appropriate capture. PC-119's perchlorate concentration is the lowest among all extraction wells of SWF, so to suspend pumping at well PC-119 is acceptable to NDEP;
c. The NERT should bring ART-1 and ART-2 of AWF back to the 2015Q2 pumping rate and maintain appropriate capture of the western side of the NERT plumes at AWF once the IX system at the Lift Station 1 is fully functional because the perchlorate concentration of ART-1 and ART-2 is higher than the perchlorate concentration of most SWF wells;
d. It is expected that the IWF groundwater table will rise after implementing the soil flushing, but the NERT should plan to remove more mass from the Sunset Road Wells and the Parcel A wells based on the information presented in Table 4 of the COP summary report;
e. NERT should also consider to update the plume mass video showed in the Downgradient Investigation Kick-off meeting on 12/2/2015 and make it available;
f. NDEP encourages NERT to explore the idea to put new wells to address several areas where high concentrations of perchlorate appear to be bound up in finer-grained soil (at the former Parcel A and near Sunset Road) as stated in Section 2.4.1 ATHENS WELL FIELD OPTIMIZATION and in Table 4 of the COP summary report. However, NDEP requests that NERT put more detail information about the perchlorate of the finer grained soil (at the former Parcel A and near Sunset Road) either as supplemental to the 2015 COP summary report or future work plan of this proposed work;

Table 1. Historic data of some operation parameters

	Flow (gpm)			Mass (lbs./d)		Strategy	
Components	**Pump Capacity**	**Max Historic Flow**	**Average Flow in 2015**	**Max of Historic Perchlorate Mass Removal**	**Perchlorate Mass Removal in 2015**	**Recommended Flow in the Summary (gpm)**	**Calculated Perchlorate Mass Flow in the Summary (lbs./d)**
SWF	1,203	740	536	664	74	N/A	N/A
AWF	495	485	286	1,164	524	344	580 (892*)
IWF	203	105	65	1,467	686	N/A	N/A

*892 lbs. /day is calculated with using recommended flow rate and well perchlorate concentration of November 2015.

f. The success of the COP depends on smooth GWETS operations that include normal function of FBRs, GWTP, GW-11, Lift Stations, extraction wells of IWF, AWF and SWF. The predicted GW-11 water level has been far away from actual water level because of so many interruptions of the GWETS normal operation in 2015. The NDEP requests that the NERT makes every effort to have smooth GWETS operation in future;

g. The interpolated perchlorate concentration was used to calculate mass removal in Table 7 of the COP summary report. NERT should calculate the mass removal using the perchlorate concentration from the monthly sampling results when it is available. However, if the well or site doesn't have latest sampling results, then interpolated concentration can be used to estimate the mass removal.

2. NDEP agrees with all seven activities listed under Section 3.0—Planned COP Activities for 2016.
3. It is acceptable to implement all items under Section 3.2—GWETS Infrastructure Improvements and Performance Monitoring and Data Accessibility but NDEP requests that NERT re-rank items and put replacement of both submersible pumps at Lift Station 3 to accommodate pumping rates up to 500 gpm and the evaluation of the effluent pipeline to a higher priority list and these two items should be completed or a plan to replace be accepted by NDEP within 3 months from the date of this letter. Then the next priority should be well pump evaluation and re-habitation and replacement of the backup pump at Lift Station 2.
4. Maximum operating influent of GWTP or the chromium treatment plant is 88 gpm and average influent of GWTP in 2015 was about 65 gpm. Higher extraction flow rate from IWF due to rising groundwater table is expected after implementing full scale of soil flushing, so it is likely that present GWTP will not have enough operating capacity. NDEP noticed that NERT is planning a pilot study of in-situ treatment of chromium in 2016. NERT should prepare full upgrade of GWTP incase that the in-situ treatment of chromium is not working.
5. NDEP is in agreement with other activities proposed under Sections 3.3 and 3.4 but want to confirm if the soil flushing will use the spray irrigation. NDEP noticed that the ongoing soil flushing pilot study didn't use the spay irrigation.

Please contact the undersigned with any questions at wdong@ndep.nv.gov or 702-486-2850 x252.

Sincerely,

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Bureau of Industrial Site Cleanup
NDEP-Las Vegas City Office

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