northgate

environmental management, inc.

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Date: July 7, 2010

To: Shannon Harbour, PE
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Nevada Division of Environmental Protection

RE: Responses to May 24, 2010 NDEP comments on the *Capture Zone Evaluation Work Plan, Tronox LLC, Henderson, Nevada,* dated May 13, 2010

This memo provides the final Response to Comments (RTC) for the *Capture Zone Evaluation Work Plan, Tronox LLC, Henderson, Nevada* (CZEWP; Northgate, May 13, 2010). In a May 24, 2010 letter, the Nevada Division of Environmental Protection (NDEP) approved the CZEWP, but requested that Tronox submit an annotated response to comments provided in that letter.

1. *General comment, TRX should provide the goal(s) for pumping at the Interceptor Well Field (IWF), Athens Road Well Field (AWF), and Seep Well Field (SWF). These goals should be used in support of Step 2, Define Target Capture Zone(s) of the guidance* A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems *(EPA, 2008) with discussion on whether these goals are being attained by each of the well fields.*

   Response: As discussed in an April 16th NDEP-TRX meeting, the overall goal for groundwater extraction at the IWF and AWF is to capture a minimum of 95% of the perchlorate mass flux at those locations. Based on evaluations to date, Tronox believes these goals are being met; however, the work being conducted for the revised Capture Zone Evaluation (CZE), including the development of the three-dimensional flow model, will improve these evaluations, at which point we will revisit these conclusions. Both the capture goals and the actual capture, based on the expanded and improved CZE, will be described in the revised CZE Report to be submitted to NDEP in December 2010. No specific goal has been established yet for the SWF because it will depend to some extent on what can be achieved at the other two well fields and on the results of the in-situ bioremediation pilot study. Capture at the SWF is further complicated by the presence of the City of Henderson Rapid Infiltration Basins (birding ponds) and the close proximity to the Las Vegas Wash. The December 2010 report will provide further assessment of remedial measures appropriate for the seep area.

2. *Section 2.2, page 5, please explain why M-73 is not included in the proposal to evaluate the effectiveness of the barrier wall.*

   Response: Tronox's proposal for the barrier wall investigation is targeting the "dead zone" wells located upgradient of the recharge trenches, where recharge of the clean Lake Mead water is expected to be significant and trends in the sampling data are more likely to be observable. However, Tronox will also monitor water levels in wells M-73 and M-74 during the investigation, and may collect water quality samples from these wells if effects of the pumping are observed.

3. *Figures, NDEP has the following comments:*

   a. *Please include groundwater elevation data for all wells associated with the groundwater isocontours*.

      Response: The groundwater elevation contours are from the *Annual Remedial Performance Report for Chromium and Perchlorate, July 2008 – June 2009, Tronox LLC, Henderson Nevada,* dated August 21, 2009. In the CZE Report figures, and in other future submittals where potentiometric surface contours are shown, Tronox will identify the source of the contours and/or label the groundwater elevation at each well shown.

   b. Figure 3, NDEP has the following comments:

      i. East of the UMCf high, in the area of ART-9/ART-7, TRX should note that there is currently insufficient data to draw a closed, hatched contour at elevation 1585 ft msl around ART-9/ART-7. This contour could just as likely be connected to the 1585 ft msl contour to the north where dashed. Likewise, the contour(s) in question should be dashed. NDEP understands that the proposed well to the north of PC-137 will help clarify this issue.

      Response: Tronox acknowledges that the contours should be dashed, based on the currently available data. As additional information becomes available from the CZE, it is expected the contours will be better defined.

      ii. West of the UMCf high, in the area of ART-3, TRX should note that there is currently insufficient data to draw closed, hatched contours. These contours should be dashed.

      Response: Tronox acknowledges that the contours should be dashed based on the currently available data. As additional information becomes available from the CZE, it is expected the contours will be better defined.

4. *Appendix A, NDEP has the following comments:*

   a. *Response-To-Comment (RTC) 3.b.ii, page 2, NDEP requested that UMCF wells be installed in the area east of the barrier wall to delineate the horizontal extent of the deeper contamination and for the quanitification of this mass for groundwater capture. Per an NDEP-TRX meeting on May 16, 2010, NDEP has decided that these wells are necessary for the groundwater capture evaluation. Two additional UMCF wells should be added in the vicinity of the two proposed shallow extraction wells as shown on Figure 2.*

      Response: Tronox believes that NDEP is referring to a meeting held on **April 16th** at the Tronox facility in Henderson. Based on the April 16th meeting and following a review of monitoring data from Timet wells screened in the Upper Muddy Creek formation (UMCf), Tronox proposed six wells screened in the UMCf at three well pair/cluster locations along the eastern border of the Site, upgradient of the barrier wall. Tronox believes that these six wells, along with the cluster of four wells screened in the UMCf on the downgradient side of the eastern edge of the barrier wall, provide adequate data for the evaluation of groundwater capture in the UMCf. As discussed during a July 1, 2010 conference call with NDEP, it is Tronox's understanding that NDEP concurs that the six additional wells proposed by Tronox are sufficient for the groundwater capture evaluation. Therefore, Tronox does not intend to install the two additional monitoring wells requested in the comment.

   b. *RTC 4(a)(i), and 4(a)(ii), pages 3-4, NDEP and TRX have met to discuss the use of AquaTrack technology. Please clarify whether this technology is still being considered by TRX for evaluation of the barrier wall. Based on the information provided by WillowStick at a May 16, 2010* [sic] *meeting, NDEP believes that there is too much potential interference (metal utility corridors, current manufacture operations, etc.) at the Site for the Aquatrack technology to provide meaningful results.*

      Response: Tronox no longer intends to utilize the AquaTrack technology for evaluation of the barrier wall.