

**OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE**

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December 27, 2018

Dr. Weiquan Dong, P.E.  
Bureau of Industrial Site Cleanup  
Nevada Division of Environmental Protection  
2030 E. Flamingo Rd, Suite 230  
Las Vegas NV 89119

RE: AP Area Down and Up Flushing Treatability Study Results Report  
Nevada Environmental Response Trust  
Henderson, Nevada

Dear Dr. Dong:

The Nevada Environmental Response Trust (NERT) is pleased to present the revised AP Area Down and Up Flushing Treatability Study Results Report for Nevada Division of Environmental Protection (NDEP) review. This report has been revised in accordance with NDEP's comments provided in your October 11, 2018 letter. As requested, an annotated response to comments accompanies this transmittal letter. The results of this treatability study will be ultimately incorporated into the Feasibility Study (FS) to be prepared by NERT following completion of the Remedial Investigation. The evaluation of the applicable remedial action alternatives completed in the FS will consider the findings of this treatability study, as well as any others conducted, to prepare NERT's recommendation for remedial action alternatives to address Henderson Legacy Conditions.

If you have any questions or concerns regarding this matter, feel to contact me at (702) 960-4309 or at [steve.clough@nert-trust.com](mailto:steve.clough@nert-trust.com).

Office of the Nevada Environmental Response Trust



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NDEP Comment	Response to Comment
<p>1. Section 5.2.2 Down Flushing System Performance. Figure 7B is not 3D plots. If the paper copy can't easily reflect the 3D features, NERT should include a digital 3D plots. NDEP also suggests a 3D geological block model for 1) Plot 1 and 2) Plot 2, and 3) Table 2 Down Flushing Perchlorate Mass Reduction. NDEP would like more details on the perchlorate mass estimation should be included in this report. The parameters including perchlorate concentration and porosity should be interpolated first by the sampling intervals, then summed by geologic media, i.e., 1) unsaturated Qal, 2) Saturated Qal, 3) Entire Qal and 4) UMCf.</p>	<p>3-D PDF files illustrating the perchlorate concentration distributions for Plots 1 and 2 during both the baseline and confirmation sampling events are now included in the revised report as Appendix K. These files are also being transmitted electronically to easily reflect the 3-D features. To view these files electronically, open the PDF files using Adobe Acrobat Reader and click on the image to activate. Based on the addition of Appendix K, Figures 7A – 7C have been replaced with Figures 7A-7F to provide 2-D plots of confirmation sample results, which also provides a response to NDEP Comment #3.</p> <p>3-D geological block models for Plots 1 and 2 are also included in Appendix K. These two geological block models have been oriented at approximately the same viewing angle as the 3-D PDFs of baseline and confirmation perchlorate concentrations so the reader can compare the geology to the concentration data. Placing both sets of data on the same block model would be difficult to interpret.</p> <p>With respect to additional details on perchlorate mass estimation, the following text has been added to Section 5.2.2 of the revised report:</p> <p><i>“EVS performs the mass calculations within a user-specified constant concentration shell and set of geologic layers. The soil volumes and chemical masses are integrated based on the concentrations at all nodes, and then summed to obtain the total analyte mass within the shell. For soil, the analyte masses are directly computed from the cell volumes, soil density, and concentration.</i></p> <p><i>To maintain consistency with other efforts to estimate perchlorate mass at the NERT site, the mass estimates have been updated using the mean dry bulk density (i.e., 1.47 g/mL for the QAL and 1.27 g/mL for the UMCf) and mean porosity values (i.e., 0.44 for the Qal and 0.54 for the UMCf) proposed in the 2018 Mass Estimate for the Remedial Investigation Study Area (Ramboll Environ, Inc., 2018).”</i></p> <p>Based on the values presented in the second paragraph, the mass estimates were updated and are presented in the revised Table 2 (and subsequent Table 8). We note that the revised dry bulk density and porosity values affect the calculated masses, but not the mass reduction percentage, which is the more important metric for evaluating treatment effectiveness.</p>

NDEP Comment	Response to Comment
<p>2. <i>Section 5.5.3 Tracer Dye, Page 29. Tracer dyes were used to evaluate the vertical and horizontal distribution of the injections, as well as the groundwater flow rate, but the report states that the tracer dyes have not been observed at any of the downgradient monitoring wells, approximately 420 days following the initial injections. Is NERT still monitoring wells for evidence of traces? Report on page 30 states it could take as much as 784 days for that distance and this report cover 420 days. The reasons stated in the report on page 30 all have implications to CSM.</i></p>	<p>NERT is not currently monitoring for dyes at the monitoring and extraction wells associated with the AP Area Down and Up Flushing Treatability Study. The monitoring portion of this task was completed in January 2018. Since the estimated time period of up to 784 days has not elapsed, we propose conducting two additional rounds of dye sampling in January and February 2019. The results of these sampling events will be provided to NDEP in March 2019.</p>
<p>3. <i>Figures 5a and 5b. Pre-injection Soil Concentration at Depth for Plots 1 and 2. NDEP suggests adding corresponding figures for the perchlorate concentration of the confirmation sampling samples.</i></p>	<p>Corresponding figures depicting perchlorate and hexavalent chromium concentrations in the confirmation soil samples are provided as Figures 7a and 7f.</p>
<p>4. <i>Appendix B Summary Data Tables (Summary of Down Flushing Soil Analytic Results for Plots 1 and 2). There are several boring locations at which the perchlorate concentrations of the confirmation sampling samples are greater than the perchlorate concentrations of baseline sampling samples. What natural process in the site could have increasing concentrations? NDEP would like a double check on this discrepancy. Since this data was used for the mass reduction and Figures 7B and 7C, they need to be checked if discrepancies are found.</i></p>	<p>Confirmation soil sampling was conducted approximately 3 feet from the baseline sampling locations to avoid sampling the abandoned baseline soil borings. There are no natural processes at the Site to cause higher concentrations. Given the heterogeneity of the alluvial sediments both vertically and horizontally at the Site, past perchlorate uses at the Site, historic water level rise, and the application of Stabilized Lake Mead Water at the surface by emitters from piping during down flushing, slight differences in perchlorate soil concentrations would be expected.</p>
<p>5. <i>Many tables in Appendix still have red "DRAFT". Please remove it in next reversion.</i></p>	<p>The DRAFT watermark has been removed from the Appendix tables.</p>