OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE

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December 12, 2022

Dr. Weiquan Dong, P.E.
Bureau of Industrial Site Cleanup
Nevada Division of Environmental Protection
375 E. Warm Springs Road, Suite 200
Las Vegas, Nevada 89119

RE: GW-11 Pond Closure Pre-Closure Summary and Alternatives Analysis, Revision 1
Nevada Environmental Response Trust
Henderson, Nevada

Dear Dr. Dong:

The Nevada Environmental Response Trust (NERT) is pleased to present the attached annotated response to comments for Nevada Division of Environmental Protection (NDEP) review. After careful review of NDEP's comments on the GW-11 Pond Closure Pre-Closure Summary and Alternatives Analysis, Revision 1, as presented in the October 18, 2022 NDEP letter, preparation of a revised report does not appear to be necessary. A detailed cost estimate and basis for closure of the GW-11 Pond will be prepared following collection of additional data.

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.

Office of the Nevada Environmental Response Trust

Stephen R. Clough

Stephen R. Clough, P.G., CEM
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NDEP Comment (previous)	Response to Comment (previous)	NDEP Comment (current)	Response to Comment (current)
Fatal Flaw 1: Cost Sections 4.3.1.3, 4.3.2.3, 4.3.3.3, 4.3.4.3, 4.4.3 various pages. The NDEP acknowledges this is a screening level alternatives analysis, however it is still important to provide sufficient cost detail for each alternative in order to support justification of a recommended remedy. For instance, in Section 3.3.3 Semi-volatile Organic Compounds (SVOCs) page 19 the HCB concentrations are relatively high in multiple borings. Per Section 3.3.10 additional investigation was to be completed in January 2022 with laboratory results expected in February 2022. The February 2022 results are not presented in this report, and therefore it is unclear what the cost impact could be if there were a larger quantity of embankment material failing TCLP. Therefore, the NDEP requests NERT provide an assumptions table for each alternative that includes all items that are expected to have a significant influence (cumulatively or individually) on the overall cost. The assumptions tables can show either an estimated quantity or quantity range for each item. The assumptions table should also include references to the cost estimate basis (e.g., contractor knowledge, vendor quote, model, etc.).	As indicated in the GW-11 Pond Closure Pre-Closure Summary and Alternatives Analysis (Report), the cost estimates provided are pre-design cost estimates and, as such, include a range of -30 % to +50%. The primary purpose for inclusion of costs at this phase was to provide NDEP an order of magnitude basis to evaluate the recommended option presented in the Report. After approval of the Report by the NDEP, and as noted in NERT's 2022 Annual Budget, it is the intent of the Trust to develop a detailed cost estimate and basis for closure of the GW-11 Pond, which will represent the most cost-effective approach to successfully achieve the selected closure option with current unit and contractor pricing immediately before implementation. Acknowledging the above, a basis for the cost estimates presented in the Report has been included as Appendix H of the revised document. The January 2022 sampling was not designed to further the understanding of whether additional embankment materials might fail TCLP, rather it was designed to determine if additional embankment materials might be able to be managed on site as clean fill. Accordingly, and due to the fact that the purpose of the additional data was to reduce disposal volumes, the Trust opted to submit the Report ahead of receipt and analysis of the additional data. Acknowledging the above, the text in Section 3.3 of the revised Report has been updated to include the results of the January 2022 sampling. Tetra Tech acknowledges that additional soil testing will be required during project implementation to finalize soil management planning and associated costs. However, based upon current data, there is no current basis for assuming any of the embankment material is hazardous. See the response to Essential Correction 11 below regarding the additional investigation of the embankment materials.	*It does not appear that the volume reduction from dewatering is included in the cost estimates. Please explain the cost estimate of $1.6 million for disposal. The responses with respect to the estimates provided not accounting for the reduction in volume if they achieve the percent solids that are stated In Section 3.2. It states that there is approximate 50,075 to 52,975 cyds of solids. Assuming 53,000 cyds, and considering the other properties provided for this material (e.g., total solids of 2.78 % and specific gravity of 1.009) there is an estimated 1,250 tons (~800 cubic yards) of dry solids in the material. If the material is dewatered to 25% solids in the geotubes, it would result in about 5,400 cyds of sludge for disposal. For the centrifuge option, it is indicated that the solids content could be in the 41% to 48 % range, which would produce about 2,600 to 3,100 cyds of dewatered sludge, respectively. NDEP requires an explanation why the calculation appears to be disposing of the entire 53,000 cyds and not considering the reduction in volume due to dewatering.*	As noted in the September 6, 2022 response to NDEP comments, the cost estimates provided in the GW-11 Pond Closure Pre-Closure Summary and Alternatives Analysis (Report) were included to provide NDEP an order of magnitude basis to evaluate the recommended option presented in the Report. Although the physical properties analysis (included as Table 2 in the Alternatives Analysis) indicated a 2.78% total solids value, field dewatering methods are not capable of removing 100% of the water from the dredged sludge material. Additionally, the physical properties were determined from a single composited sample that Tetra Tech did not presume to be fully representative of all the solids in the Pond. At the direction of the Trust, and in order to provide a conservative estimate, Tetra Tech utilized the known volume of Pond solids determined from the Bathymetric and Geophysical Survey conducted in 2018 and applied conservative estimates for density (80 lbs/ft^3) of the Pond solids and dewatered weight (40-45% of wet weight) of the Pond solids. Furthermore, and as noted in NERT's 2022 Annual Budget, it is the intent of the Trust to develop a detailed cost estimate and basis for closure of the GW-11 Pond, which will provide updated volume estimates for the dewatered sludge based on additional field testing to further evaluate properties of the dewatered sludge. Additional samples will be collected from Pond to support the effort to provide a refined estimate of the volume of dewatered sludge for disposal. When the project is complete, actual costs will reflect actual quantities disposed.

NDEP Comment (previous)	Response to Comment (previous)	NDEP Comment (current)	Response to Comment (current)
Essential Correction 3: Section 3.2.3 Solids Settling Test Page 9 The report on the settling tests is not included in Appendix C. *Was this testing performed at a different time?* *Is this why the data from the settling tests were not used to determine the polymer/coagulant doses performed in the Geotube and Centrifuge tests?*	The settling test described in the Report is typical of tests performed during the Alternative Analysis/Feasibility Study phase of a project. The objective of this test was to provide a broad understanding of settling characteristics of the sediment/water mix and polymers that would enhance the settling rate. The 2020 solids settling tests were successful in: • Providing a general understanding of solid content and the time for solids to settle without any polymer addition. • The effect on the rate of solids settling after addition of a specific polymer. • The effect on the rate of solids settling after varying the concentrations of a specific polymer and varying the total solids concentration of the solid/water mixture. • Providing data that informed subsequent tests, including the additional Alternative Analysis/Feasibility Study phase testing conducted for the geotube effectiveness test (Geotube Dewatering Technology [GDT] Test) and the centrifuge effectiveness test as detailed in Section 3.2.4. • The effectiveness of sodium permanganate to oxidize volatile hydrogen sulfide. The solids settling test is straightforward and it is common for this test to be conducted in-house. The summary of the test procedure, observations, results, and recommendations are provided in Section 3.2.3. A separate report of the test was thus not included with the appendices. The solids settling tests were conducted in September 2020 by Tetra Tech, prior to the geotube and centrifuge testing detailed in Appendices C and D, respectively. The results and data from the solids settling tests were utilized in determining the reagent doses for all subsequent tests performed by Tetra Tech or its subcontractors during the alternatives analysis phase of the work. The solids settling tests will inform additional tests that are anticipated during the detailed design and planning phase of the work. The text in Section 3.2.3 has been updated to clarify the tests were used to determine subsequent reagent doses in the geotube and centrifuge tests, and that the tests were not intended to be exhaustive at this stage and additional testing will be performed as necessary during detailed planning and design.	*Suggest including the report describing the September 2020 testing by Tetra Tech as an Appendix*	As noted in the September 6, 2022 response to NDEP comments, the solids settling test was conducted in-house (i.e. conducted by Tetra Tech) and was summarized in Section 3.2.3 of the Report. A separate solids settling tests report does not exist. All relevant data was provided in Section 3.2.3 of the Report.

NDEP Comment (previous)	Response to Comment (previous)	NDEP Comment (current)	Response to Comment (current)
Essential Correction 9: Section 3.2.4.3 Filter Press Page 12 Polymer and/or coagulant are often added to assist with dewatering using a filter press. Because it is likely this test would have yielded different results if the polymer and/or coagulant were used, please explain why this was not done.	Tetra Tech concurs that evaluation of dewatering by mechanical separation methods may include chemical condition of slurry using polymers to assess potential enhanced efficacy. Primarily for this reason, the centrifuge effectiveness test and filter press effectiveness test were initially planned to include GW-11 Pond slurry feeds that were (1) untreated, and (2) chemically conditioned with the addition of polymers. Laboratory testing was performed by Andritz Separation Technologies, a leader in material separation testing technology and products. As described in Appendix C, the centrifuge effectiveness test was conducted with both untreated and conditioned slurry feeds. As part of the filter press effectiveness test, Andritz Separation Technologies recommended not performing a R-Meter test with polymer flocculated sludge because it is easy for an overdose of polymer to foul the filter cloth. Tetra Tech concurred with this recommendation based on: • The results of the filter press effectiveness test on GW-11 Pond materials without chemical conditioning which yielded low effectiveness results. • Use of higher levels of polymer concentrations necessary to improve dewatering results would negate the use of a specialized process like filter press and make the other alternatives more favorable (i.e., use of geotubes). Maintenance and frequent shut-downs are one of the primary disadvantages of the filter press technology when chemical conditioning is required to achieve optimal performance. It is common for polymers or materials escaping the pre-screening to foul the filter cloth. This would have further decreased the full-scale production rate and/or resulted in the need for multiple parallel units as back-up to allow for periods of maintenance.	*NDEP recommends that any future testing involving a filter press also include polymer/ coagulant testing.*	Data presented in the Report supported the selected dewatering method using geotubes as summarized in Alternative B. Accordingly, it is the intent of the Trust to proceed with the proposed Alternative B, as presented in the Report. Therefore, no additional testing involving a filter press will be conducted.

NDEP Comment (previous)	Response to Comment (previous)	NDEP Comment (current)	Response to Comment (current)
Essential Correction 11: Section 3.3.3 Semi-volatile Organic Compounds (SVOCs) page 19 The HCB concentrations are relatively high in multiple borings. This could have significant project implications if material fails TCLP during implementation. Per Section 3.3.10 additional investigation was to be completed in January 2022 with laboratory results expected in February 2022. These results should be included in the closure analysis.	With respect to the January 2022 data, please see our response to Fatal Flaw #1. The text in Section 3.3 and Appendices E and F have been updated to include the results of the January 2022 sampling. The embankment sampling data indicate that embankment materials are unlikely to be characteristically hazardous. Tetra Tech acknowledges that additional soil testing will be required during project implementation for waste profiling, but there is no current basis for assuming any of the embankment material is hazardous. As indicated in the table documenting the alternative cost assumptions presented in Appendix H of the revised alternatives analysis, the basis for the embankment material disposal costs included an assumption that 15% of the estimated embankment volume could be repurposed for use on site based on the preliminary sampling. The results of the January 2022 investigation indicate that the volume of soil with constituent concentrations less than the SMP soil screening levels may be limited to a smaller area in the vicinity of GW-11-10 than originally assumed. Based on the January 2022 sampling results, the basis for the embankment material disposal costs was updated using a revised assumption that 5% of the estimated embankment volume could be repurposed for use on site. The volumes and costs in Section 4.1.2, Section 5.0, and Appendix H have been updated accordingly.	*The concern with the HCB is the high total concentrations in some of the samples and the limited amount of TCLP data. NDEP recommends that during subsequent phases of the project, additional sampling be conducted for TCLP HCB analysis to confirm the embankment material is nonhazardous throughout prior to disposing of the material offsite.*	As noted in the September 6, 2022 response to NDEP comments, Tetra Tech intends to perform additional soil testing for waste profiling purposes. This additional testing will include TCLP HCB analysis.
Essential Correction 18: Section 4.2 GW-11 Pond Contents Removal and Treatment/Disposal Alternatives page 27 Alternative A is the only alternative where water is pumped off prior to solids removal. Please explain whether water is being retained in the other two options to create a water blanket to prevent the emission of H_2S?	The other two options (Alternatives B and C) involve pumping a slurry to a dewatering area and returning filtrate to the GW-11 Pond prior to treatment of the water through the Biological Treatment Plant. This process (Alternatives B and C) results in water being retained in the pond prior to treatment through the Biological Treatment Plant. Hydrogen sulfide mitigation will be performed prior to removal of pond solids; therefore, it is not the intent of the other two options to create a water blanket to prevent the emission of hydrogen sulfide.	*With alternatives B and C, consider removing as much water as practical prior to starting the remediation project so that this water does not have to be managed.*	Tetra Tech intends to evaluate the removal of water from the Pond prior to initiating the pond closure project during the detailed planning and design phase. The evaluation will take into the account the requirements of the Clark County Department of Air Quality Minor Source Permit which requires a minimum of 10 feet of water over the Pond solids for odor control (see Section 2.1 of the Report), the project timeline and capacity of the GWETS to accept flow from the GW-11 Pond and/or filtrate from the geotubes, any other direction from the Trust at the time of project implementation, and any operational requirements for the specific hydraulic dredge to be used to dredge Pond solids. Generally speaking, it will be the objective of the Trust to minimize project complexities, timelines, and thus cost, to the extent possible.

NDEP Comment (previous)	Response to Comment (previous)	NDEP Comment (current)	Response to Comment (current)
Essential Correction 22: Section 4.3.3 Alternative B – Solids Dewatering Utilizing Geotubes page 31 *If H_2S mitigation is being done prior to solids or water removal, why wouldn't the water be removed before removing and dewatering the solids? The solids would be easier to manage if the water was pumped off and it would be more efficient to empty the Pond during the dewatering step without additional water removal and treatment. Is there a concern that a water blanket is necessary to manage the H_2S even after the permanganate treatment?*	In Alternative B, the water in the GW-11 Pond is necessary to slurry and transport the pond solids to the geotube dewatering area. All of the water in the pond will ultimately be treated via the Biological Treatment Plant. Treating a portion of the water before removing and dewatering the solids will not improve efficiency. A water blanket is not necessary to manage the H_2S after permanganate treatment.	*With 2.8% solids, additional water should not be necessary to pump the material. Refer to NDEP response to response to Essential Correction 18*	See response to Essential Correction 18 comment.
Essential Correction 24: Section 4.3.3.2, 3e, Page 31 *Sending the water from the geotube dewatering to the GWETS and not back to the Pond would minimize managing the water multiple times. Please consider making this change or provide an explanation of why this is not possible/advisable.*	As noted in Section 3.2.7, the influent flow rate to the Biological Treatment Plant for dewatering of the GW-11 Pond solids will be dependent on Trust treatment priorities and the resulting hydraulic capacity of the Biological Treatment Plant. Section 4.3.2.2 explains that the feed rate of filtrate to the Biological Treatment Plant is expected to be small relative to influent flow from the well fields given current operating conditions (e.g., 100 gpm dewatering filtrate combined with 1,000 gpm well field flow). The dewatering rate of the geotubes is initially expected to be much higher than the allowable influent flow rate to the Biological Treatment Plant, and the dewatering rate cannot be scaled back to match a lower Biological Treatment Plant feed rate. Filtrate from the geotube dewatering can be pumped or gravity drained to the GW-11 Pond at rates that match the dewatering rate of the geotubes, while water can be pumped from the pond to the Biological Treatment Plant at a rate that matches the hydraulic capacity of the Biological Treatment Plant, thus affording the Trust maximum flexibility while implementing pond closure.	*Please refer to NDEP response to response to Essential Correction 18*	See response to Essential Correction 18 comment.