

# OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE

Le Petomane XXVII, Inc., Not Individually, But Solely as the Nevada Environmental Response Trust Trustee

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October 2, 2021

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: Las Vegas Wash ZVI-Enhanced Bioremediation Treatability Study Work Plan Addendum  
and Cost Estimate and Basis  
Nevada Environmental Response Trust  
Henderson, Nevada

Dear Dr. Dong:

The Nevada Environmental Response Trust (NERT or Trust) is pleased to present the Las Vegas Wash ZVI-Enhanced Bioremediation Treatability Study Work Plan Addendum and Cost Estimate and Basis for Nevada Division of Environmental Protection (NDEP) review and approval. As you are aware, NERT began implementation of the ZVI-Enhanced Bioremediation Treatability Study in early 2018 (formerly known as the Galleria Road ZVI-Enhanced Bioremediation Treatability Study) limited to the Phase 1 pre-design activities as specified in the Galleria Road ZVI-Enhanced Bioremediation Treatability Study Work Plan dated September 29, 2017 and subsequently approved by the NDEP on October 26, 2017. The Trust completed Phase 1 pre-design activities in June 2019; however, due to uncertainty with NERT being able to complete the entirety of the ZVI study in the initial Phase I location (Landwell owned parcels) along Galleria Road, NERT prepared Treatability Study Modification No. 9 which proposed relocating the field implementation phase of the study (Phase 2) to a location in OU-3 and collecting additional data to support the relocation. Through this modification, which was prepared following a comprehensive evaluation of study objectives and then current data, the Trust determined that Transect 1A, as previously evaluated by Tetra Tech as part of the Las Vegas Wash Bioremediation Pilot Study Work Plan, was the most suitable location for Phase 2. NDEP approved the modification in a letter dated October 14, 2019, and the data collection and limited bench-scale laboratory testing was completed in April 2020. Based on the results of the Phase 1 efforts, the Trust directed Ramboll to prepare documentation to implement Phase 2 of the study to evaluate the effectiveness of implementing ZVI-enhanced bioremediation to reduce contaminants present in the alluvium and UMCf in OU-3 near the Las Vegas Wash. NERT worked closely with Ramboll and Arcadis to ensure the scope of this treatability study was sized appropriately to achieve the objectives of the study and capture data necessary to support an evaluation of this remedial technology in the forthcoming Feasibility Study. Upon finalization of the Phase 2 project scope, the Trust directed Ramboll to prepare a Work Plan Addendum and Phase 2 Cost Estimate and Basis document for peer review by Arcadis, the Trust's third-party subject expert. Arcadis' review involved a detailed evaluation to ensure the following with respect to the proposed Phase 2 scope of work:

1. Implementability;
2. Scope is commensurate with the study's objectives; and,
3. Costs are commensurate with the scope of work.

Arcadis submitted its Review and Comment memorandum (**Attachment A**) to NERT on August 30, 2021. Through evaluation of this memorandum, along with continued dialogue between the Trust, Arcadis, and Ramboll, the Trust arrived at the final Phase 2 scope as presented in the attached Work Plan Addendum (**Attachment B**) and Phase 2 Cost Estimate and Basis (**Attachment C**).

In summary, Arcadis concluded that through the collaborative efforts of all parties from mid-2020 to mid-2021 to refine project scope and budget, the study is implementable, the scope is commensurate with the study’s objectives, and the costs are commensurate with the scope of work. While Attachments B and C address all comments provided by Arcadis and the Trust through the review process, the following table presents the Trust’s response to the Arcadis comments provided in Attachment A.

WORK PLAN ADDENDUM	
Arcadis Comment	NERT Response
<p><i>With respect to the Field-Testing Objectives (Section 7.1 in the Revised Work Plan Addendum), two objectives have been removed and two objectives have been added. The two objectives removed were “Evaluate hydraulic conditions for potential groundwater mounding and ability to maintain appropriate residence time,” and “Evaluate the appropriateness of selected monitoring parameters and determine appropriate monitoring means and methods for assessing system performance.” The intent of these objectives appears to be captured by rewording the remaining objectives. The two objectives added were “Confirm the results of the laboratory testing demonstrating that nitrate, chlorate, and perchlorate can be fully degraded in the field using ZVI, where ZVI acts as both a reactive media and a source of hydrogen,” and “Evaluate methods of increasing and sustaining the numbers of active perchlorate-reducing bacteria in the subsurface via biological inoculation and nutrient addition.” The addition of these two objectives may be the motivation for increased costs associated with research collaboration with the Colorado State University (CSU). If the Trust elects to forgo some of the research-focused scope, as recommended herein, these Field-Test Objectives may need to be removed or revised.</i></p>	<p>With respect to the additional two objectives, the Trust worked with Ramboll and Arcadis to ensure the final scope only included what was necessary to achieve the overall Phase 2 objectives as specified in Section 1.2 of the Work Plan Addendum and more specifically the field testing approach objectives specified in Section 7.1.</p> <p>Accordingly, certain technical components initially contemplated and detailed in draft iterations of project documentation, such as CSU advanced biological characterization and enhanced performance monitoring, were eliminated from the study and thus the Work Plan Addendum and Phase 2 Cost Estimate provided herein.</p>

WORK PLAN ADDENDUM	
Arcadis Comment	NERT Response
<p><i>On page 7-6 in Section 7.3 (ZVI Emplacement Methods), the text reads "...unlike other trenching methods that could allow layering of backfill materials, the ZVI backfill will need to extend to the ground surface." The Trust may benefit from learning about Mersino's one-pass trenching capabilities with respect to layering because it could reduce the requisite ZVI cost. As this would need to be balanced against equipment availability and subcontractor quotes, the Trust may also benefit from more justification for the selection of DeWind's one-pass trencher.</i></p>	<p>Ramboll engaged with and evaluated multiple one-pass trenching contractors, including Mersino, and determined through a variety of criteria such as cost, availability and equipment that DeWind was the most suitable contractor to perform the work at the time the Work Plan Addendum was finalized.</p> <p>However, as indicated in the Cost Estimate and Basis, and as part of the contractor procurement process, formal bids will be requested from multiple contractors, including Mersino, following completion of the pre-construction activities and potential revisions to the design. The Trust acknowledges the potential additional benefit of the Mersino capability and will further evaluate this option through the final contractor selection process.</p>
<p><i>Section 8.8 (Biological Performance) and 8.9 (Advanced Biological Characterization and Monitoring) do a sufficient job explaining and defining the proposed tasks to apparently accomplish the added Field-Testing Objectives. However, the scope and granularity of these sections appear to be excessive. The Trust may be able to fulfill the more practical overall objective of demonstrating that the introduction of ZVI can effectively and efficiently result in the reduction of site-related constituents of concern in groundwater without this degree of specialty analyses and associated costs.</i></p>	<p>As indicated in the NERT response to the first Arcadis comment, the Advanced Biological Characterization scope, including additional performance monitoring scope to support this effort, was removed from the project scope and the costs were adjusted accordingly.</p> <p>Additional cost adjustment details as a result of certain descoping is described in more detail in subsequent response to comments below.</p>

COST ESTIMATE AND BASIS	
Due to the multiple iterations of draft documentation associated with the Arcadis review, the costs associated with the final Work Plan Addendum and Cost Estimate and Basis attached hereto will be referred to as Cost #3, whereas the costs associated with and detailed in prior review iterations of the documentation will be referred to as Cost #1 (June 2020 draft) and Cost #2 (May 2021 draft).	
Arcadis Comment	NERT Response
<p><i>Cost #2 is approximately \$1,945,822 higher than Cost #1. This increase is distributed as follows: 56.6% increase in labor costs, 35.6% increase in subcontractor costs, and 7.8% increase in other direct costs (ODCs).</i></p> <p><i>(For additional details provided in support of the above, please see Attachment A)</i></p>	<p>As a result of a comprehensive evaluation conducted by the Trust to ensure parity between the scope of Phase 2 and assumed requirements of the forthcoming Feasibility Study, material modifications were made to the scope of the study subsequent to and in response to the Cost #2 comments provided by Arcadis.</p> <p>The net effort of this descoping effort by the Trust resulted in a final Phase 2 cost of \$6,505,124 (i.e. Cost #3), which represents an approximate \$1,222,000 reduction in costs from Cost #2 and are largely attributed to the following:</p> <ul style="list-style-type: none"> <li>• Elimination of the in-situ sensors</li> <li>• Elimination of advanced biological characterization</li> <li>• Elimination of enhanced performance monitoring</li> <li>• Removal of the perimeter fence installation</li> <li>• Adjustment to labor associated with the above</li> </ul> <p>The following should also be noted:</p> <ul style="list-style-type: none"> <li>• The details surrounding the above items are not discussed in the attached documentation because they have been eliminated from the study.</li> <li>• A large component of the increase in Cost #2 when compared to Cost #1 (approximately \$725,000) was primarily due to the addition of a third sub-test area (i.e., Test Area 2c) which consists of three rows of ZVI borings, which was incorporated to address Arcadis' suggestion to assess varying ZVI dosages (i.e., when compared to two rows of ZVI borings).</li> </ul> <p>With respect to labor charges as noted by Arcadis, and as a result of the previously described work scope adjustments, final labor costs (i.e. Cost #3) are approximately 17% lower than the Cost #2 estimate. Furthermore, the final estimated number of labor hours is currently 17,051 (i.e. Cost #3), which is approximately 19% lower than the Cost #2 estimate.</p> <p>With respect to subcontractor costs as noted by Arcadis, and as a result of the previously described work scope adjustments, subcontractor costs in the current estimate are approximately \$3,853,000 (i.e. Cost #3), which is approximately 14% lower than in the revised estimate Cost #2.</p> <p>In summary, it is the opinion of both Arcadis and the Trust that the scope of Phase 2 as documented in the attached is commensurate with the study's objectives while the Phase 2 cost estimate of \$6,505,124 is fair and commensurate with the proposed scope of work.</p>

COST ESTIMATE AND BASIS	
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Arcadis Comment	NERT Response
<p><i>The ODCs represented a comparably smaller percentage of the total cost increase (7.8%); however, the ODCs did increase from \$280,497 to \$431,706 (54%). Correspondingly, the largest percentages of this ~\$151,209 increase are associated with Task 1.7 (17.9%), Task 1.8 (48.6%), and Task 1.9 (21.0%), which is reasonable for the scope described. Refinements to the scope associated with Task 1.2 and Task 1.9 with respect to labor costs discussed above should have a corresponding influence on the requisite ODCs.</i></p>	<p>As a result of the previously described descoping and cost adjustments, the ODCs as shown in Cost #2 (\$431,706) were reduced by approximately 31% to approximately \$301,000 as shown in the final cost estimate (Cost #3).</p>

Acknowledging successful completion of the third-party review process, it is the desire of the Trust to initiate the Phase 2 efforts as detailed in Attachment B as soon as possible. The Trust currently estimates field mobilization can begin within 60 days of receipt of i) NDEP comments and/or approval of the attachments contained herein; ii) receipt of all permits required for implementation of the study; and, iii) access agreements with applicable property owners. Project updates on all facets of this study will continue to be provided through submittal of monthly progress reports.

If you have any questions or concerns regarding this matter, feel to contact me at (702) 960-4301 or at [brian.loffman@lepetomaneinc.com](mailto:brian.loffman@lepetomaneinc.com).

Office of the Nevada Environmental Response Trust



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Office of the Nevada Environmental Response Trust Trustee  
October 2, 2021

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