

OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE

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October 27, 2017

Mr. James (JD) Dotchin
Bureau of Industrial Site Cleanup
Nevada Division of Environmental Protection
2030 E. Flamingo Rd., Suite 230
Las Vegas, NV 89119

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

Ms. Alison Fong
U.S. Environmental Protection Agency
Region 9, RCRA Branch
75 Hawthorne Street
San Francisco, CA 94105

RE: Transmittal of *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 1*;
Response to July 11, 2017 Letter and Comments from the Lower Colorado River Water Quality
Partnership and Response to August 29, 2017 Comments from NDEP on the May 5, 2017 *RI/FS Work
Plan Addendum: Phase 3 Remedial Investigation*
Nevada Environmental Response Trust Site
Henderson, Nevada

Dear Mr. Dotchin, Mr. Dong and Ms. Fong:

The Nevada Environmental Response Trust (NERT or the Trust) is pleased to present the *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 1* for Nevada Division of Environmental Protection (NDEP) review. This revised work plan addresses comments on the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 0* provided by the Lower Colorado River Water Quality Partnership (the Partnership), NDEP, and the U.S. Environmental Protection Agency (US EPA).

The Trust appreciates the thorough review provided by the Partnership in its July 11, 2017 letter and would like to note their acknowledgement that the proposed Remedial Action Objectives (RAOs) are consistent with the overall objective of protection of downstream interests as stated in the July 11, 2017 letter.

Chemicals of Potential Concern

Multiple comments were received in response to Revision 0 of the work plan with respect to chemicals of potential concern (COPCs). Revision 1 of the work plan incorporates changes throughout to more clearly delineate the application of different COPC groups (i.e. NERT Site COPCs, NERT Off-Site Study Area COPCs, Downgradient Study Area/Northeast Sub-Area COPCs, and Eastside Sub-Area COPCs [Table 1-1 and Figure 1-3]) to the entirety of the NERT RI Study Area. Furthermore, additional references have been inserted to more clearly delineate the Eastside Sub-Area and Northeast Sub-Area within the Eastside Study Area.

Operable Unit Strategy

NERT has modified the Operable Units (OUs) into three distinct OUs to better align with the Remedial Action Objectives (RAOs). However, NERT does not agree with the basis for the three-OU approach stated in the Partnership's letter as it appears that the basis is that the NERT Site represents an immediate and significant

risk. We disagree with this conclusion as the removal actions implemented at the NERT Site (i.e., the groundwater extraction and treatment system [GWETS] and soil removal) have mitigated the risks posed by on-site source areas such that all drinking water meets applicable standards and no imminent or substantial threat to human health exists. We therefore disagree with the assertion in the letter that the on-site source areas require immediate actions to minimize downgradient migration and that this area should be addressed as the highest priority to reduce risks in a timely manner. Much more significant, we believe, is to complete characterization of both the on-site source areas and the areas both directly downgradient and in the Eastside Study Area (what we have now defined as OU-2) to provide a comprehensive understanding of: 1) the magnitude and extent of contamination in the alluvium and Upper Muddy Creek formations; 2) significant migration pathways; and 3) the relationship of these pathways to the Las Vegas Wash in furtherance of our ongoing efforts to protect the downstream interests of the Las Vegas Wash.

We have incorporated the three-OU concept as a way to have consistent RAOs within each OU, however we propose to create a single remedial investigation (RI) report which addresses both OU-1 and OU-2¹ and a separate RI report for OU-3. The Trust would like to note that it would retain the flexibility to bifurcate the OU-1 and OU-2 reports, if necessary.

A response to the “Comments on Specific Sections” included in Section B of Attachment A in the Partnership’s July 11, 2017 letter is provided in Attachment 1.

A response to the comments included in Attachment A of the NDEP’s August 29, 2017 letter, inclusive of comments provide by US EPA, is provided in Attachment 2.

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, P.G., CEM
Remediation Director

CEM Certification Number: 2399, exp. 3/24/19

Attachment 1: Response to the Partnership’s July 11, 2017 Comments on Specific Sections of the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation*

Attachment 2: Response to the NDEP’s August 29, 2017 Comments on the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation*

Cc (via NERT Sharefile Distribution):

Jeff Kinder, NDEP, Deputy Administrator
James Dotchin, NDEP, Chief, Bureau of Industrial Site Cleanup
Carlton Parker, NDEP, Bureau of Industrial Site Cleanup
Alan Pineda, NDEP, Bureau of Industrial Site Cleanup
Christa Smaling, NDEP, Bureau of Industrial Site Cleanup
Micheline Fairbank, Nevada Attorney General’s Office
Alison Fong, U.S. Environmental Protection Agency, Region 9

¹ We would like to switch the numbering of the Partnership’s proposed OU-2 and OU-3, so that the OU numbering follows the geography from the NERT Site downgradient to the Wash. This numbering will also align better with the current plan to provide one combined RI report for OU-1 and (renumbered) OU-2.

Office of the Nevada Environmental Response Trust Trustee
October 27, 2017

Mark Duffy, U.S. Environmental Protection Agency, Region 9
Jay Steinberg, as President of the Nevada Environmental Response Trust Trustee and not individually
Andrew Steinberg, as Vice President of the Nevada Environmental Response Trust Trustee and not individually
Tanya C. O'Neill, Foley and Lardner, LLP

Cc (via NERT Stakeholder Sharefile Distribution):

Betty Kuo, Metropolitan Water District of Southern California
Brenda Pohlmann, City of Henderson
Carol Nagai, Metropolitan Water District of Southern California
David Johnson, Central Arizona Water Conservation District
Dave Johnson, LV Valley Water District
Eric Fordham, Geopentech
Jill Teraoka, Metropolitan Water District of Southern California
Kevin Fisher, LV Valley Water District
Marcia Scully, Metropolitan Water District of Southern California
Maria Lopez, Metropolitan Water District of Southern California
Mickey Chaudhuri, Metropolitan Water District of Southern California
Peggy Roefer, Colorado River Commission
Scott Bryan, Central Arizona Water Conservation District
Steven Anderson, LV Valley Water District
Todd Tietjen, Southern Nevada Water Authority

Cc (via NERT BMI Companies Sharefile Distribution):

Anna Springsteen, Neptune Inc.
Kirk Stowers, Broadbent Inc.
Kristen Lockhart, Neptune Inc.
Kurt Fehling, The Fehling Group
Patti Meeks, Neptune Inc.
Paul Black, Neptune Inc.
Paul S. Hackenberry, Hackenberry Associates
John Edgcomb, Edgcomb Law Group
Andrew Barnes, Geosyntec
Brian Waggle, Hargis + Associates
Chinny Esakkiperumal, Olin Corporation
Chuck Elmendorf, Stauffer
Curt Richards, Olin Corporation
Dave Share, Olin Corporation
Ebrahim Juma, Clean Water Team
Ed Modiano, de maximus
Gary Carter, Endeavour LLC
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Jeff Gibson, Endeavour LLC
Joanne Otani, Joanne M. Otani LLC
Joe Kelly, Montrose Chemical
Joe Leedy, Clean Water Team
Kelly McIntosh, GEI Consultants
Kevin Lombardozzi, Valhi
Kyle Gadley, Geosyntec
Lee C. Farris, Landwell
Mark Paris, Landwell
Michael Bogle, Womble Carlyle Sandridge & Rice, LLP
Michael Long, Hargis + Associates
Nick Pogoncheff, PES Environmental, Inc.

Office of the Nevada Environmental Response Trust Trustee
October 27, 2017

Ranajit Sahu, BRC
Richard Pfarrer, TIMET
Rick Kellogg, BRC
Allan DeLorme, Ramboll Environ
John Pekala, Ramboll Environ
Derek Amidon, Tetra Tech
Dan Pastor, Tetra Tech

ATTACHMENT 1

Response to the Partnership's July 11, 2017 Comments on Specific Sections
of the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation*

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>1. <u>Executive Summary, page ES-1, second paragraph</u>: Insert "originating from the NERT Site" in the second sentence as follows: "The investigation is designed to determine the extent of contamination <u>originating from the NERT Site</u> in the Eastside Study Area, ..."</p>	<p>The Executive Summary has been updated with the requested edit, which now states that the "investigation is designed to determine the extent of COPC contamination originating from the NERT Site..."</p>
<p>2. <u>Executive Summary, page ES-1, fourth paragraph</u>: Clarify the location of the Eastside Study Area. The first sentence of this paragraph states: "The Eastside Study Area is located <u>adjacent to</u> an industrial land use area (the current Black Mountain Industrial [BMI] Complex). . . ." However, it is not clear whether the Eastside Area is part of the BMI Complex since the first sentence in Section 3.0 on page 11 states: "Much of the Eastside Study Area where the Phase 3 RI will take place was part of the original BMI Complex area, ..."</p>	<p>Section 3.0 has been updated to clarify that "Much of the Eastside Sub-Area, where a portion of the Phase 3 RI will take place, was part of the original BMI Common Areas. The BMI Complex, which historically included the BMI Common Areas, ..."</p> <p>The following sentences have also been added to the Executive Summary, "The majority of the Eastside Sub-Area was historically part of the BMI Common Areas, portions of which were used for wastewater disposal by chemical producers at the neighboring BMI Complex. Much of the Eastside Sub-Area is currently vacant and is no longer associated with any operations within the BMI Complex."</p>
<p>3. <u>Section 1.0 - Introduction, page 1, second paragraph</u>: Change "NERT" to "the Trust" in the first sentence as follows: "In May 2016, NDEP directed NERT <u>the Trust</u> to expand its RI Study Area and investigate Henderson Legacy Conditions (HLC) in ..."</p>	<p>Section 1.0 has been updated to refer to "the Trust" rather than "NERT."</p>
<p>4. <u>Section 1.0 - Introduction, page 2, second bullet</u>: Change "Section 2" to "Sections 2 and 4.2.3."</p>	<p>Section 1.0 has been updated to indicate that the Northeast Sub-Area's history is discussed in Sections 2.0 and 4.2.3.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>5. <u>Section 2.7.2 - Local Geology, page 8, first partial paragraph</u>: Change "NERT's" to "the Trust's" in the following sentence: "The BRC CSM will be evaluated and refined as part of NERT's <u>the Trust's</u> development of the NERT CSM and as part of the NERT RI Study Area RI Report."</p>	<p>Section 2.7.2 has been updated to refer to "the Trust" rather than "NERT."</p>
<p>6. <u>Section 2.8 - Surface Water</u>: The man-made lakes for the golf course in the Northeast Area should also be identified as surface water in the study area. Groundwater studies in the area should evaluate potential groundwater mounding that would affect groundwater flow.</p>	<p>According to personnel at the Chimera Golf Club, the man-made lakes within the golf course are lined and are therefore unlikely to result in groundwater mounding.</p> <p>NERT's current groundwater model, which was presented to the Partnership on August 16, 2016 and subsequently submitted to NDEP on November 16, 2016, includes the area occupied by the Chimera Golf Course and does incorporate additional recharge resulting from landscape irrigation. A brief discussion of the man-made lakes has been added to Section 2.8. We will continue to evaluate available information for this area as part of the Phase 3 RI characterization work.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>7. <u>Section 3.0 - Regulatory Actions and Site Investigations, page 12, first paragraph, and Figure 3-1</u>: Why did NDEP grant NFA status to certain non-impacted areas of the BMI Common Area (which are referred to as "Exclusion Areas")? Are those areas still excluded, or is BRC currently investigating and remediating the environmental impacts associated with constituents other than perchlorate and chlorate within those areas? Why are those "Excluded Areas" included within the Eastside Study Area that NDEP has directed the Trust to investigate?</p>	<p>Based on NERT's review of the NFA, NDEP granted a NFA determination to certain non-impacted areas of the BMI Common Areas (i.e., the "Exclusion Areas") following the preparation of the Environmental Characterization Report for the Exclusion Areas (ERM 1997, <i>see reference below</i>). This Environmental Characterization Report included performance of a Phase I Environmental Site Assessment and soil sampling within the Exclusion Areas under a NDEP-approved work plan. The Exclusion Areas continue to maintain their NFA status for shallow soil (down to 10 feet below ground surface [bgs]).</p> <p>The Exclusion Areas are included as part of the Eastside Study Area because there is some evidence that historical groundwater mounding may have resulted in limited migration of subsurface contamination to the south of the former Upper BMI Ponds.</p> <p>Section 3.0 has been updated to include additional information regarding the Environmental Characterization Report prior to NFA determination for the Exclusion Areas.</p> <p>While the investigation outlined in the Phase 3 RI Work Plan includes soil and groundwater samples within the area for which NDEP previously issued NFA determinations, the Trust has no intention to re-open the NFA determination and the new data obtained by the Trust will only be analyzed for purposes of addressing the COPCs for which the Trust is directed by NDEP to address.</p> <p>With respect to BRC's current investigation, the Trust understands that BRC will prepare a groundwater Remedial Alternatives Study (RAS) for the NDEP, upon approval by NDEP of NERT's Phase 3 RI Work Plan.</p> <p>Reference: ERM-West, Inc. (ERM), 1997. Environmental Characterization Report, BMI Exclusion Areas 3, 4A, 4B, 5/6, Henderson, Nevada. April. Approved by NDEP on September 30, 1997.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>8. <u>Section 3.0 - Regulatory Actions and Site Investigations, page 13, third paragraph</u>: Should the references to "chromium" be changed to "hexavalent chromium," such as "Perchlorate and hexavalent chromium are the primary Site-related chemicals detected in soil at the NERT Site and in groundwater beneath and downgradient of the Site"?</p>	<p>The document has been updated to refer to hexavalent chromium (rather than total chromium) when referring to site contaminants, including in Section 3.0.</p> <p>For additional background, and following NDEP approval in 2016, hexavalent chromium was generally eliminated from NERT's on-going monitoring program following a detailed analysis of hexavalent chromium to total chromium ratios (Ramboll Environ 2016, <i>see reference below</i>). The analysis found that the ratio of hexavalent chromium to total chromium was approximately 1 within the NERT groundwater plume (i.e., the concentration of total chromium is generally equal to the concentration of hexavalent chromium in groundwater). Therefore, mass estimates of hexavalent chromium, as well as interpretations of the lateral and vertical extent of hexavalent chromium in soil and groundwater, performed as part of the RI will primarily rely on total chromium data (rather than hexavalent chromium data).</p> <p>Reference: Ramboll Environ, 2016. 2016 Groundwater Monitoring Optimization Plan, Nevada Environmental Response Trust Site, Henderson, Nevada. April 29. NDEP approved June 24, 2016.</p>
<p>9. <u>Section 4.1 - Initial Evaluation of Current Conditions</u>: The occurrence and distribution of hexavalent chromium in the Eastside Study Area should be included in the discussion provided in this section.</p>	<p>While perchlorate and hexavalent chromium are the primary Site-related chemicals detected in soil at the NERT Site and in groundwater beneath and downgradient of the Site, NERT's Phase 3 RI within the Eastside Sub-Area will be limited to the investigation of perchlorate and chlorate. In addition to perchlorate and chlorate, chromium and hexavalent chromium are included on the COPC list for the Northeast Sub-Area, consistent with the Downgradient Study Area COPCs. Any remediation of hexavalent chromium and chromium in groundwater within the Eastside Sub-Area will be performed by BRC pursuant to the terms of the Settlement Agreement and Administrative Order on Consent, BMI Common Areas, with NDEP, 2006 (AOC3).</p> <p>Additional language clarifying the investigation of chromium has been added to the Executive Summary, as well as Sections 1.0 and 4.1.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>10. <u>Section 5.0 - Remedial Action Objectives and ARARs, page 22, first full bullet</u>: Should the reference to "chromium" in the following sentence be changed to "hexavalent chromium": "The most prevalent COPC detected in groundwater at the Site other than perchlorate is chromium"?</p>	<p>The document has been updated to refer to hexavalent chromium (rather than chromium) when referring to Site contaminants, including in Section 5.0.</p> <p>See additional information regarding total chromium and hexavalent chromium in the response to comments #8 and #14. A clarifying footnote with this information has also been added to Section 5.0.</p>
<p>11. <u>Section 5.0 - Remedial Action Objectives and ARARs, page 22, footnote 2</u>: The word "Hazardous" should be changed to "Hazard" and the words "perchlorate in" should be added to the following sentence: "Office of Environmental Health Hazardous Assessment (OEHHA) within the California Environmental Protection Agency (Cal EPA) has issued a preliminary health goal (PHG) of 1 µg/L for perchlorate in drinking water (Cal EPA 2015)."</p>	<p>The footnote in Section 5.0 has been updated to correct the title of the OEHHA and specify that the referenced screening criteria apply to perchlorate.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>12. <u>Section 5.0 - Remedial Action Objectives and ARARs, page 22, second paragraph</u>: According to the RI/FS Work Plan (Revision 2), hexavalent chromium is a COPC at the NERT Site and, according to the Phase 3 RI Work Plan, the OU reports will include "[u]pdated interpretations of the lateral and vertical distributions of perchlorate and hexavalent chromium in soil and groundwater, which will provide the basis for estimates of the residual COPC mass in vadose zone soil and groundwater." However, the Phase 3 RI Work Plan does not mention California's MCL for hexavalent chromium and, instead, focuses only on chromium, stating that the "chemical-specific ARAR for chromium is the federal maximum contaminant level (MCL) of 100 µg/L, which the State of Nevada has adopted by reference (NAC 445A)." Similar to referencing California's MCL for perchlorate, <u>Section 5.0 Remedial Action Objectives and ARARs</u> should indicate that short- and long-term remedial actions will help achieve California's MCL for hexavalent chromium.</p>	<p>As noted in the response to comment #9, NERT's Phase 3 within the Eastside Study Area are limited to the investigation of perchlorate and chlorate within the Eastside Sub-Area and limited to perchlorate, chlorate, chromium and hexavalent chromium within the Northeast Sub-Area, consistent with the COPCs in the Downgradient Study Area.</p> <p>Information included in Section 5.0 is not specific to the Eastside Study Area and was included in order to update the Remedial Action Objectives (RAOs) and ARARs for the entire NERT RI Study Area, which now consists of the NERT Site, the NERT Off-Site Study Area, the Downgradient Study Area, and the Eastside Study Area. However, the RAOs for the Eastside Sub-Area will only apply to perchlorate and chlorate. A clarifying statement regarding the role of the RAOs and ARARs presented in the Work Plan has been added to Section 5.0, as well as the Executive Summary.</p> <p>With regard to California's MCL for hexavalent chromium, on May 31, 2017, the Superior Court of Sacramento County issued a judgment invalidating the hexavalent chromium MCL for drinking water. The change became effective on September 11, 2017 when the Office of Administrative Law filed the change with the Secretary of State. Therefore, a California MCL for hexavalent chromium no longer exists. However, the California MCL for total chromium has been added to Section 5.0.</p> <p>With regard to providing a basis for estimates of residual COPC mass in vadose zone soil and groundwater, the Trust will present a methodology for determining mass estimates in the NERT RI Study Area Mass Estimate and Expanded Performance Metric Technical Approach Technical Memorandum, which will be submitted under separate cover.</p>

Response to the Partnership's July 11, 2017 Comments on Specific Sections on the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation* Nevada Environmental Response Trust Site, Henderson, Nevada

Partnership Comment	Response to Comment
<p>13. <u>Section 5.2 - Revised Potential Long-Term RAOs for the Expanded RI Study Area, page 23, fourth bullet</u>: Change "will" to "may" in the last sentence as follows: "Contaminant reduction efforts will<u>may</u> be necessary to ensure that mitigating discharge to the Las Vegas Wash can be achieved."</p>	<p>The word "will" has been changed to "may" in Section 5.2, as requested.</p>
<p>14. <u>Section 6.9 - Data Evaluation and Reporting, page 32, paragraph #1</u>: "The mass estimates are anticipated to include estimates of perchlorate and chromium mass in the unsaturated zone, the saturated alluvium, and the saturated UMCf." Will the mass of hexavalent chromium also be estimated in these various zones?</p>	<p>This sentence has been updated to refer to "estimates of perchlorate and hexavalent chromium mass in the unsaturated zone..."</p> <p>Prior analysis has found that the ratio of hexavalent chromium to total chromium is approximately 1 within the NERT groundwater plume (i.e., the concentration of total chromium is generally equal to the concentration of hexavalent chromium in groundwater). Therefore, any mass estimate developed for hexavalent chromium will incorporate total chromium data.</p>
<p>15. <u>Figure 1-2 - Surrounding BMI Complex Facilities</u>: The legend shows American Pacific to be a purplish color, but the former AMPAC site is not colored on the figure. Also, the Endeavour (former AMPAC; former Pepcon) site on Figure 1-2 is a different shape from the Endeavour (former AMPAC; former Pepcon) site on Figure 1-3.</p>	<p>Figure 1-2 depicts current property ownership (shown in color), as well as key former features (outlined and labeled), for select properties within the Study Area and vicinity. The former PEPCON/former American Pacific (AMPAC) site is no longer owned by these entities, and is therefore not depicted in the purplish color. A small parcel located southwest of the City of Henderson Birding Ponds is the only parcel depicted as owned by AMPAC (now Endeavour). To avoid confusion, Figure 1-2 was revised to eliminate this small AMPAC (now Endeavour) property from the figure and legend.</p> <p>Figure 1-4 (formerly Figure 1-3) has been updated to show the same former PEPCON/former AMPAC boundary as depicted in Figure 1-2.</p>

ATTACHMENT 2

Response to the NDEP's August 29, 2017 Comments
on the May 5, 2017 *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation*

NDEP Comment	Response to Comment
Essential Corrections	
<p>1. <u>General Comment</u>: Throughout the RI/FS Work Plan Addendum: Phase 3 Remedial Investigation there does not appear to be a consistent or coherent definition of the term COPC. NDEP suggests that NERT refer Administrative Order on Consent about BMI Common Area Phase 3 (2006) clearly to explain why the hexavalent chromium and VOCs are not chosen as COPCs.</p>	<p>Revision 1 of the work plan incorporates changes throughout to more clearly delineate the application of different COPC groups (i.e. NERT Site COPCs, NERT Off-Site Study Area COPCs, Downgradient Study Area/Northeast Sub-Area COPCs, and Eastside Sub-Area COPCs) to the entirety of the NERT RI Study Area. We have clarified the definition of "COPC" throughout the document as it relates to both the Eastside Study Area and the NERT RI Study Area.</p> <p>As discussed within the Executive Summary, Section 1.0, Table 1-1 and Figure 1-3, the COPCs within the Eastside Sub-Area are limited to perchlorate and chlorate. In addition to perchlorate and chlorate, chromium and hexavalent chromium will be investigated within the Northeast Sub-Area, consistent with the Downgradient Study Area COPCs. Any additional investigation and/or remediation of hexavalent chromium and chromium within the Eastside Sub-Area will be performed by BRC pursuant to the terms of the Settlement Agreement and Administrative Order on Consent, BMI Common Areas, Phase 3, with NDEP, 2006 (AOC3).</p>
<p>2. <u>Planned Phase 3 RI Activities, pages ES-3 and ES-4:</u></p> <ul style="list-style-type: none"> a. 1st bullet, page ES-3 - the text lists as rationale for baseline sampling as due to large variances in perchlorate and chlorate concentrations, but does not provide supporting data. NDEP requests inclusion of a supporting data summary. b. 2nd bullet, page ES-3 - NDEP requests the inclusion of depth range for "deep soil borings." c. 6th bullet, page ES-4 - NDEP requests clarification of the term "focused" hydraulic testing. 	<ul style="list-style-type: none"> a. The requested perchlorate and chlorate data are included as Appendix A and are referenced in Section 6.6, which discusses the groundwater sampling program. For consistency with the report's tables and figures, the new appendix is not specifically referenced within the Executive Summary. b. The referenced bullet within the Executive Summary has been updated to indicate that the deep soil borings are 120 to 150 feet deep with two locations that are 200 feet deep. The depth of the soil borings has also been added to Sections 6.2 and 6.4. This information is also included in Tables 6-4 and 6-5. c. The referenced bullet has been modified to further explain the scope of planned focused hydraulic testing.

Response to the NDEP's August 29, 2017 Comments on the May 5, 2017
 RI/FS Work Plan Addendum: Phase 3 Remedial Investigation
 Nevada Environmental Response Trust Site, Henderson, Nevada

NDEP Comment	Response to Comment
<p>3. <u>Section 2.2, Site Description, 2nd paragraph, p. 4</u>: It should be noted that two schools, and thus, possible sensitive receptors, also exist within the southern portion of the Eastside Area; Lake Mead Christian Academy expansion and Pine Crest Charter.</p>	<p>Section 2.2 has been updated to indicate the presence of these two schools within the southern portion of the Eastside Sub-Area.</p>
<p>4. <u>Section 2.7.2 - Local Geology</u>: The United States Geological Survey (USGS) Preliminary geologic map of the Lake Mead 30' X 60' quadrangle, Clark County, Nevada, and Mohave County, Arizona (2007) documents the Horse Spring Formation (including the Bitter Ridge Limestone and Lovell Wash Members, and the Thumb Member) as outcropping at the ground surface near the very northernmost part of the Northeast Area. Similarly, the Nevada Bureau of Mines and Geology, Geologic Map of the Henderson Quadrangle, Nevada, Map 67, 1980 documents the Horse Springs Formation and the Thumb Formation in this area. The 1980 geologic map is shown on Figure 4-3b as a basemap. Section 2.7.2 should be revised to reflect the geologic mapping done in this part of the Northeast Area.</p>	<p>The Horse Springs Formation and Thumb Formation have been added to Section 2.7.2.</p>
<p>5. <u>Section 4.1, Initial Evaluation of Current Conditions, Summary of Key Findings, page 17, 2nd bullet on page</u>: There are two zones below the Shallow WBZ, please clarify if this applies to both the Deep and Middle WBZ or is limited to the Middle WBZ.</p>	<p>This bullet has been updated to clarify that perchlorate has been detected in both the Middle and Deep WBZs and that a sub-set of groundwater samples collected from these wells have historically been non-detect for perchlorate.</p>

Response to the NDEP's August 29, 2017 Comments on the May 5, 2017
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 Nevada Environmental Response Trust Site, Henderson, Nevada

NDEP Comment	Response to Comment
<p>6. <u>Section 5.0, Remedial Action Objectives and ARARS, 1st bullet, p. 22</u>: The Deliverable states that "Other Site COPCs: The most prevalent COPC detected in groundwater at the Site other than perchlorate is chromium. The chemical-specific ARAR for chromium is the federal maximum contaminant level (MCL) of 100 µg/L, which the State of Nevada has adopted by reference (NAC 445A). For other Site COPCs, the chemical-specific ARARs/TBCs discussed above will be evaluated based on the results of a site-specific risk assessment and incorporated into the Site FS." This statement implies that COPCs other than Henderson Legacy Conditions COPCs will be evaluated. Please make clearer that the Phase 3 RI will only evaluate the COPCs of perchlorate and chlorate.</p>	<p>Revision 1 of the work plan incorporates changes throughout to more clearly delineate the application of different COPC groups (i.e. NERT Site COPCs, NERT Off-Site Study Area COPCs, Downgradient Study Area/Northeast Sub-Area COPCs, and Eastside Sub-Area COPCs) to the entirety of the NERT RI Study Area. We have clarified that application of the RAOs will be specific to the COPCs for each respective area of the NERT RI Study Area. As discussed within the Executive Summary, Section 1.0, Table 1-1 and Figure 1-3, the COPCs within the Eastside Sub-Area are limited to perchlorate and chlorate. Further, within the Eastside Sub-Area, application of the RAOs will be limited to its COPCs, perchlorate and chlorate. Please see additional information in response to comment #1.</p>
<p>7. <u>Section 6.1 – Identification of Data Gaps</u>: The NDEP would like to highlight the importance of investigating the transport pathways and sources within the Eastside Study Area contributing to the perchlorate mass loading to the Las Vegas Wash as far as the downstream extent of the impacts recently identified in the Downgradient Study. Collaboration and connection between these two Ramboll Environ and AECOM led studies is essential to building the comprehensive CSM that will be reported in the RI Reports.</p>	<p>The Trust concurs with NDEP's interest in investigating transport pathways and any potential contribution to mass loading within Las Vegas Wash from within the Eastside Study Area. Both the Phase 3 RI Work Plan's focus on delineating the extent of COPCs mass in the subsurface and further defining the subsurface groundwater flow system are both consistent with these goals. The findings of this investigation, presented in the OU-1/OU-2 RI Report, will be integrated with the findings of the Downgradient Investigation, presented in the OU-3 RI Report, and together, the two RI Reports will comprise the comprehensive NERT RI Study Area Reports.</p>
<p>8. <u>Section 6.1 – Identification of Data Gaps, Summary of Data Gaps</u>: The USGS and Nevada Bureau of Mines and Geology have documented the presence of geologic units other than the alluvium and Upper Muddy Creek Formation near the northern extent of the Northeast Area. This should be evaluated during implementation of the investigation per Section 6.1, which indicates that delineation of features important to understanding the groundwater flow system will be addressed as a data gap.</p>	<p>The data gap discussion now references further delineation of the Horse Springs formation and Thumb formation as important components in understanding groundwater flow systems within the Northeast Sub-Area.</p>

NDEP Comment	Response to Comment
<p>9. <u>Section 6.1, Identification of Data Gaps, Summary of Data Gaps, bullets, pp. 25-26</u>: Three of the four bulleted data gap items are justifiably associated with groundwater. This is consistent with page ES-3, which includes a listing showing that 6 of the 7 data gap items are associated with groundwater. To this reviewer, it appears that the primary overall objective of the work plan is to obtain data that will allow for estimates of mass and mass flux of perchlorate and chlorate in groundwater.</p> <p>a. Describe the methodology to be used to quantify mass flux.</p> <p>b. On Table 6-6, why are some wells being tested using the 'new well recovery test' whereas others are being tested using the 'step-specific capacity test'? Provide a brief description of the methodology associated with these tests. List the methodology/methodologies to be used to quantify hydraulic conductivity.</p>	<p>a. The forthcoming mass estimates technical memorandum will provide a detailed methodology for quantifying mass flux. A footnote referencing the mass estimates technical memorandum has been added to the mass flux investigation objective included in Section 6.2.</p> <p>b. Table 6-6 has been revised. During the development of each new well, recovery testing will be performed to obtain qualitative information on the specific capacity (and thus empirical values of transmissivity) of each well. Formal and more comprehensive hydraulic testing of wells representing different geographies and stratigraphic levels throughout the Eastside Study Area will be performed following the completion of well development. Hydraulic tests will include a combination of single well specific capacity testing and slug testing. For well clusters, wells representing different depths may be monitored for changes in water level during well pumping.</p>
<p>10. <u>Section 6.2, Investigation Objectives, page 27, 5th bullet</u>: The Deliverable states that "Re-evaluation of previous interpretations of the top of the UMCf by synthesizing available stratigraphic data from previous investigations along with the results of this investigation." Interpretations of the top of the top of the Muddy Creek and particularly the transitional Muddy Creek have varied between the BMI Companies. NDEP requests specifically how this will be done, e.g., explain how or what methods will be used to synthesize the data.</p>	<p>A clarifying statement has been added to the 5th bullet in Section 6.2 to clarify that the re-evaluation is based on review/interpretation of soil boring logs and available geologic information, and is not based on kriging or other statistical methods. Any additional synthesis, if necessary, will be approved by NDEP through submittal of a RI modification and reported as part of the forthcoming RI report.</p>

NDEP Comment	Response to Comment
<p>11. <u>Section 6.4 - Investigation of the Deeper Shallow WBZ and Upper Middle WBZ, New Monitoring Wells</u>: Section 6.4 includes information about the proposed investigation and the planned installation of new groundwater monitoring wells in the Eastside Study Area. According to Table 6-5 the new wells are proposed to be constructed with 15 or 20-foot long well screens. Note 1 of Table 6-5 states that well construction details may be modified based on the lithology encountered during drilling. Section 6.4 should be revised to provide a general rationale for the proposed well screen lengths presented in Table 6-5. Additionally, revisions should provide a brief rationale for a scenario that might require deviating from the proposed well screen length specifications per Note 1 of Table 6-5.</p>	<p>Section 6.4 has been revised to include general rationale for the proposed screen lengths, as well as scenarios that could result in adjustments to well construction from those specified in Table 6-5. Please note that deviations to well construction are more likely to involve adjustments to installation depth, rather than screen length. The target WBZ for each installation location has also been added to Table 6-5.</p>
<p>12. <u>Section 6.4, Investigation of the Deeper Shallow WBZ and Upper Middle WBZ, New Monitoring Wells - Soil Borings, page 29, 1st paragraph</u>: The Deliverable states that "To support this calculation, selected soil samples will be tested for fraction organic carbon (foc), porosity, and bulk density to provide site-specific soil properties that will be used to improve the partitioning assumptions and resulting mass estimates." The NDEP requires that ASTM methods be used for these soil analyses:</p> <ol style="list-style-type: none"> Soil Dry Bulk Density ASTM D2937; Grain Density ASTM D854; Soil Moisture Content ASTM D2216; Grain Size ASTM D422 by both sieve and hydrometer for soil particles finer than 75 μm, No. 200 sieve. Fraction Organic Carbon Walkley-Black method (Nelson and Sommers, 1992); and Soil pH – ASTM 4972. 	<p>The specific ASTM methods that will be used to support the chlorate partitioning assumptions have been added to Table 6-4 and are summarized below:</p> <ol style="list-style-type: none"> Soil Dry Bulk density – ASTM D2937 Grain Density analysis is not planned Soil Moisture content – ASTM D2216 Grain size – ASTM D422/D4464 combined, laser method. In our experiences the fine-grained UMCf is more effectively measured using the laser method rather than the sieve/hydrometer method. Fraction organic carbon – Walkley-Black method (Nelson and Sommers, 1992) Soil pH – Consistent with the Phase 1 and 2 Remedial Investigations, soil will not be analysed for pH. <p>In addition, soil samples will also be analysed for:</p> <p>Porosity – ASTM D425 modified Atterberg Limits – ASTM D4318 USCS Classification – ASTM D2487</p>

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<p>13. <u>Section 6.6, Comprehensive Groundwater Sampling, page 30</u>: The NDEP requires that DO and ORP be added to the field parameter list.</p>	<p>Section 6.6 and Table 6-2 have been updated to clarify that groundwater field parameters will include temperature, pH, dissolved oxygen (DO), oxygen reduction potential (ORP), electrical conductivity (EC), and turbidity.</p>
<p>14. <u>Section 6.7, Hydraulic Characterization</u>: This section describes characterization methods proposed to better understand the hydraulic properties of the aquifer system in the Eastside Study Area. Section 6.7 should be revised to address the following comments: (1) indicate what aquifer system hydraulic properties (e.g. transmissivity) will be estimated by conducting the single well recovery and hydraulic tests and what methods will be used to evaluate the data, (2) provide additional methodology and rationale to explain how the single well recovery tests at new wells will be accomplished during development in a way that prevents or limits the potential effects of incomplete well development on the recovery test results, and (3) Section 6.7 indicates that transducers will be installed within approximately 25 monitoring wells in the Eastside Area (excluding the Northeast Area). Conversely, the text also says that the proposed locations of the transducers will be updated as necessary to include existing wells in the Eastside Study Area (i.e, the Eastside and Northeast Areas), depending on the condition of the wells following inspection. Section 6.7 should be revised to address contradictory statements about where the transducers may be installed as part of the investigation.</p>	<p>Section 6.7 has been revised as follows:</p> <ol style="list-style-type: none"> (1) The text has been modified to clarify which hydraulic parameters will be estimated based on the type of testing performed. For example, the recovery water level data collected following well development will be used to estimate empirical values of transmissivity for the subject well (as the recovery can be considered a function of residual drawdown providing an approximate pumping rate used during development is assumed). Values of transmissivity and calculations of hydraulic conductivity will be made using a combination of single well step-drawdown, constant-rate or constant-drawdown tests, and slug tests on all new and selected existing wells (as per Table 6-6). Standard analytical methods will be used to evaluate the data based on the response of each well during testing. (2) The text has been updated to specify that water level recovery will be monitored at newly installed wells to empirically evaluate transmissivity and will be performed immediately following development and therefore will not interfere with development completion. (3) The first sentence in this paragraph has been updated to clarify that transducers will be deployed within approximately 25 monitoring wells within the Eastside Study Area.

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<p>15. <u>Section 6.8, Delineation of the Top of Muddy Creek Formation, page 31. 1st bullet at bottom of page:</u> The Deliverable states that "The 2003 survey was conducted within the BMI Common Area and <i>may have also included five transects across Las Vegas Wash</i> (italic emphasis added)." The five transects referenced herein were four transects across Las Vegas Wash and one perpendicular to a postulated fault zone that cut across the Wash where basement rock material was exposed in the Wash about 1.8 miles downstream of the Pabco Weir at this location. Further, boring logs from TIMET's investigation where the transitional MCF was logged to depth of 165 ft bgs (attached) which is an apparent lithologic anomaly. Additionally, BRC's investigators reinterpreted the boring log for AA-27 which is another apparent anomaly (Exhibit 2). The Deliverable would also benefit from the addition of the depictions of the paleochannels on a figure.</p>	<p>The description of BRC's 2003 geophysical survey transects has been revised in the text in Section 6.8, and the current paleochannel interpretations are depicted on Figure 6-4.</p>
<p>16. <u>Figure 6-4, Paleochannel Interpretations:</u> Please label each planned transect and justify why the south most transect is needed.</p>	<p>The transect labels have been added to Figure 6-4. As described in Section 6.8 of the text, the presence of the paleochannels will be confirmed by the six short boring transects labelled A through F drilled across the projected channel locations, generally at locations close to where they cross the Eastside Study Area boundaries. The southernmost transect (labelled G) is located near existing well AA-27, where the interpreted depth of alluvium appears anomalously deep. The purpose of transect G is to obtain additional information on the depth of the alluvium near this well.</p>

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NDEP Comment	Response to Comment
Minor Corrections	
<p>1. <u>Section 2.6, Climate, last sentence, p. 7</u>: Kerr-McGee (1985) is a secondary reference. NDEP requests using as a primary reference on evaporation potential Shevenell, L., 1996, Statewide Potential Evapotranspiration Maps for Nevada, Nevada Bureau of Mines and Geology, Report 48, pp. 32 or any appropriate primary reference.</p>	<p>This reference has been included in both Section 2.6 and Section 8.0 (References).</p>
<p>2. <u>Section 2.7.3, Local Hydrogeology, 1st paragraph, p. 10</u>: Values of 'hydraulic conductivity' and 'permeability' are given in units of length per time, suggesting that the terms are interchangeable. For clarity, use one term and provide the values in consistent units (i.e., feet per day).</p>	<p>The report has been revised using "hydraulic conductivity" as the most appropriate term.</p>
<p>3. <u>Section 4.2.2, Preliminary Groundwater Conceptual Site Model, 4th paragraph, p. 18</u>: The date for inception of the IWF is documented. Please provide a date in lieu of the general reference "many years."</p>	<p>This sentence has been revised to state that perchlorate treatment efforts began in the late-1990s.</p> <p>Although the IWF was originally constructed in the mid-1980s to treat on-site hexavalent chromium contamination, it was not used for perchlorate treatment until construction of the fluidized bed reactors (FBRs) in 2004. Perchlorate treatment in the late-1990s consisted of temporary ion exchange (IX) units near the Las Vegas Wash.</p>
<p>4. <u>Section 6.3 Inspection and Initial Sampling of Existing Wells, p. 28</u>: NDEP requires that all information from the well inspection will be provided to the NDEP to update the All Wells Database.</p>	<p>NERT will provide information applicable to the All Wells Database obtained during the well inspections and would appreciate NDEP's coordination of a comprehensive update to the All Wells Database with input from all involved parties.</p>

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<p>5. <u>Figure 1-2</u>: American Pacific (AMPAC) listed as "AMPAC" in the legend should be a call-out label on the map of Figure 1-2. Please label the TRECO parcel (immediately south of the west end of the WAPA parcel off the southeast corner of the Olin parcel.</p>	<p>In response to a comment from the Lower Colorado River Water Quality Partnership, the small AMPAC-owned parcel located southwest of the City of Henderson Birding Ponds has been removed from the Figure 1-2 to avoid confusion with the former PEPCON/former AMPAC property located southwest of the NERT Site. Figure 1-2 has been revised to include a label for the Treco property (located north of the NERT Site). According to Clark County records, the two light-yellow areas described in the comment are owned by TIMET. Labels for these two small parcels have been added to Figure 1-2.</p>