NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, *Governor*
James R. Lawrence, *Acting Director*
Greg Lovato, *Administrator*

August 31, 2022

Jay A. Steinberg
Nevada Environmental Response Trust
35 East Wacker Drive, Suite 690
Chicago, IL 60601

Re: **Tronox LLC (TRX) Facility**
Nevada Environmental Response Trust (Trust) Property
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to: *Response to NDEP Comments on the Remedial Investigation Report for OU-1 and OU-2*

Dated: June 9, 2022

Dear Mr. Steinberg,

The NDEP has received and reviewed the Trust's above-identified Deliverable and provides comments in Attachment A. A revised Deliverable should be submitted by **10/31/2022** based on the comments found in Attachment A. The Trust should additionally provide an annotated response-to-comments letter as part of the revised Deliverable.

Please contact the undersigned with any questions at wdong@ndep.nv.gov or 702-668-3929.

Sincerely,

Dong Weiquan

Weiquan Dong, P.E.
Bureau of Industrial Site Cleanup
NDEP-Las Vegas City Office

WD:cp

EC:
Jeffrey Kinder, Deputy Administrator NDEP
Frederick Perdomo, Deputy Administrator NDEP
James Dotchin, NDEP BISC Las Vegas
Carlton Parker, NDEP BISC Las Vegas
Alan Pineda, NDEP BISC Las Vegas
Andrew Barnes, Geosyntec
Andrew Steinberg, Nevada Environmental Response Trust
Anna Springsteen, Neptune & Company Inc.
Betty Kuo Brinton, Metropolitan Water District of Southern California

Brian Waggle, Hargis + Associates
Brian Loffman, Nevada Environmental Response Trust
Brian Rakvica, Syngenta
Carol Nagai, Metropolitan Water District of Southern California
Chris Ritchie, Ramboll
Christine Klimek, City of Henderson
Chuck Elmendorf, Stauffer Management Company, LLC
Dan Pastor, P.E. TetraTech
Dan Petersen, Ramboll
Dane Grimshaw, Olin
Daniel Chan, SNWA
Darren Croteau, Terraphase Engineering, Inc.
Dave Share, Olin
Dave Johnson, LVVWD
Derek Amidon, TetraTech
Ebrahim Juma, Clean Water Team
Ed Modiano, de maximis, inc.
Eric Fordham, GeoPentech
Gary Carter, Endeavour
Jay A. Steinberg, Nevada Environmental Response Trust
Jeff Gibson, Endeavour
Jill Teraoka, Metropolitan Water District of Southern California
Joanne Otani, The Fehling Group
Joe Kelly, Montrose Chemical Corporation of CA
Joe Leedy, Clean Water Team
John Edgcomb, Edgcomb Law Group
John-Paul Rossi, Stauffer Management Company LLC
John Solvie, Clark County Water Quality
Kathrine Callaway, Cap-AZ
Kelly McIntosh, GEI Consultants
Kirk Stowers, Broadbent & Associates
Kirsten Lockhart, Neptune & Company Inc.
Kim Kuwabara, Ramboll
Kurt Fehling, The Fehling Group
Laura Dye, CRC
Lee Farris, BRC
Marcia Scully, Metropolitan Water District of Southern California
Maria Lopez, Metropolitan Water District of Southern California
Mark Duffy, U.S. Environmental Protection Agency, Region 9
Mark Paris, Landwell
Mauricio Santos, Metropolitan Water District of Southern California
Melanie Hanks, Olin
Michael J. Bogle, Womble Carlyle Sandridge & Rice, LLP
Michael Long, Hargis +
Mickey Chaudhuri, Metropolitan Water District of Southern California
Nicholas Pogoncheff, PES Environmental, Inc.
Nicole Moutoux, U.S. Environmental Protection Agency, Region 9
Orestes Morfin, CA
Paul Black, Neptune & Company
Peter Jacobson, Syngenta
Ranajit Sahu, BRC
Rebecca Sugerman, U.S. Environmental Protection Agency, Region 9
Richard Pfarrer, TIMET
Rick Kellogg, BRC
R9LandSubmit@EPA.gov
Roy Thun, GHD

Steve Clough, Nevada Environmental Response Trust
Steven Anderson, LVVWD
Steve Armann, U.S. Environmental Protection Agency, Region 9
Tanya O'Neill, Foley & Lardner L
Todd Tietjen, SNWA
William Frier, U.S. Environmental Protection Agency, Region 9

Attachment A

NDEP Comment	Response	NDEP Comment on Response
1. General Comments		
1.1) The report was very thorough. Data was reported multiple times in the text making the report longer than was perhaps necessary. While no specific changes are requested in the text from this observation, the readability of future submissions would be helped by using figures and tables more consistently to present observations, and text to convey conclusions drawn from the data presented.	NERT acknowledges the length of the Remedial Investigation Report for OU-1 and OU-2 (RI Report); however, the structure of the document was intentional and NERT believes that the organization of the report was necessary to adequately address the size and complexity of the NERT RI Study Area, address the unique attributes of the Trust with respect to its obligations within the NERT Remedial Investigation (RI) Study Area, thoroughly discuss multiple instances of trespassing groundwater plumes, document the presence of preferential migrations pathways that are largely ignored by other Black Mountain Industrial (BMI) Complex entities, and identify the responsible parties associated with chemicals of potential concern (COPCs) within the NERT RI Study Area for which NERT is not responsible.	The response is acceptable pending review of the revised report.
1.2) Section 2 NERT RI Study Area History. A review of the chemistry of the historical manufacturing processes would have strengthened the list of COPC by including compounds not reported by the manufacturing companies due to the fact that they did not analyze for these compounds. The section does not attempt to examine chemistry reported to determine if the reactions could have produced other byproducts not recorded in the reports. An examination of the chemistry would have shown, for example, that a suite of chlorinated chemicals could be produced by reactions where chlorine came in contact with carbon sources such as graphite electrodes, peat and coal. Please discuss whether byproducts were evaluated.	As part of the development of the original RI/Feasibility Study (RI/FS) Work Plan, NERT expended considerable effort reviewing the historical investigations performed by Kerr-McGee and Tronox and related correspondence with NDEP, as well as reviewing documentation associated with historical manufacturing activities. These activities led to the analytical program that was proposed in the RI/FS Work Plan approved by NDEP on July 2, 2014. Since the RI is being implemented consistent with CERCLA, the proposed analytical program was based on those chemicals on the Hazardous Substance Lists (as defined at 40 CFR Part 302.4) that were associated with historical manufacturing operations as well as other chemicals that were considered Henderson Legacy Conditions as described in the NERT Trust Agreement. The RI/FS Work Plan was approved by NDEP after extensive negotiations. As the investigation proceeded over the last eight years, there were 29RI Work Plan Modifications each of which contained a justification for additional investigation that was approved by NDEP. In addition, the 2016 Remedial Investigation Data Evaluation Technical Memorandum (Phase 1 Tech Memo), which focused primarily on the analytical results of OU-1 (i.e., the subject area of this comment) and the identification of additional data gaps present at the time, was approved by NDEP and did not include comments related to the	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
	additional evaluation of manufacturing byproducts. The extensive discussions between NDEP and NERT regarding the scope of investigation and associated analytical program (representing a total of approximately 10,800 samples) over the years provided confirmation that the COPC selection process, as briefly summarized above, was defensible and complete. While acknowledging the above, additional information on historical manufacturing and chemical processes was considered for inclusion into the RI Report and such additional information, including discussion of potential byproducts, can be added to support the RI Report's COPC selection and conclusions. Most of this effort will be a recapitulation of effort done by others under the oversight of NDEP including efforts predating the Trust and recent efforts by NDEP's consultants though the preparation of NDEP's draft Chloroform Report. Given the necessity to perform the work consistent with CERCLA, the extensive review of previous sampling data as part of the development of the original RI/FS Work Plan, the broad analytical suite examined as part of the RI itself, and NDEPs approval and/or comments on key documents (including the RI/FS Work Plan, the Phase 1 Tech Memo, the Phase 2 and Phase 3 RI Work Plans, and the 29 RI Work Plan Modifications) since inception of the Trust, inclusion of this additional discussion of historical chemical processes will not alter the COPC selection or conclusions about contaminant distribution. However, the Trust acknowledges that inclusion of this additional discussion may aid the reader's understanding of contaminant generation and assignment of responsibility for certain contamination to adjacent properties.	
1.3) Section 5 Physical and Environmental Setting. The mobile and total water content and hydraulic conductivity in the alluvium (Qal) and the coarse- and fine-grained sections of the Upper Muddy Creek Formation (UMCF) were compared to laboratory determinations of total and mobile porosity and slug test results. The NMR hydraulic conductivity estimates were plotted against slug test estimates (Figures E-6 Comparison of Hydraulic Conductivity Estimates, per Operable Unit By operable unit) and E-7	The NMR borehole logging technology was used during the RI at the suggestion of NDEP to determine whether it could provide additional data on the properties of the major geologic units present throughout the NERT RI Study Area. The Trust concurs with NDEP that the usefulness of the NMR technology within the study area is limited. However, NMR measurements of porosity taken in-situ, particularly at greater depths, may be more representative than laboratory samples because the pressure on in situ soils at depth will be much higher than on samples in the laboratory. As a result, samples tested in the laboratory will have higher porosity from the expansion of soil due to the lower pressure. A summary of the peer-reviewed literature on this	The response is acceptable pending review of the revised report.

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Comparison of Hydraulic Conductivity Estimates, per lithology (by lithology). For a perfect match the points should fall along a 45-degree line. They do not with a significant number of points outside the one order of magnitude lines. The NMR results fall over three orders of magnitude while the slug test results fall over about six orders of magnitude. The match is better at conductivities greater than 1 ft/d. The results are comparable for the alluvium where the hydraulic conductivity is higher, but NMR tends to overestimate for fine grained sediments Therefore, the NMR method does not appear to be capable of reliably measuring low conductivities associated with fine grained sediments. Comparison of NMR and laboratory porosity results showed that the NMR results were consistently lower for both total and effective porosity. The differences in the Qal were smaller than for the fine grained UMCF. However, only 3 Qal samples were available. A potential reason given for the difference was that deeper samples may have been disturbed during sampling. This may result in laboratory samples overestimating the porosity. Therefore, the NMR results could be considered more representative. However, this theory would need to be further investigated before the NMR results could replace the laboratory results. Overall, these results do not provide enough confidence to allow NMR to replace lab porosity and slug tests. The NMR technique provides additional insights but is not recommended as a standalone technology. At present, it is doubtful that it would be able to provide data to support sequence evaluation of stratigraphy with the necessary confidence to allow use in a feasibility study. However, it may be helpful for the stratigraphic correlation in the places that don't have appropriate lithologic loggings, which is often a case for the old boring loggings.	issue will be added to the text to better characterize the potential usefulness of NMR estimates of porosity. Given the limitations of the NMR technology as applicable to NERT, the existing NMR data will only be used to supplement existing boring log data in the evaluation of sequence stratigraphy to be presented in the RI Report for OU-3. The text of the RI Report will be revised to clarify this limited use of NMR data.	

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1.4) Section 7.0 8.0 RI Results: OU-1 and OU-2. NERT uses the term "background" in connection with groundwater sampling results from a limited number of upgradient wells. However, true background conditions were never established in groundwater for the majority of COPCs in groundwater due to the extent of upgradient impacts from other PRPs. It is recommended that "background" be replaced with "up-gradient" where true background conditions have not been established and cite the draft up-gradient groundwater quality technical memorandum for TDS, arsenic, and perchlorate on issued by NDEP on the January 21, 2016.	NERT will revise the text in Revision 1 of the RI Report consistent with this comment.	The response is acceptable pending review of the revised report.
1.5) Section 8.0 RI Results: OU-2. Groundwater Flow: The discussion of Nature and Extent of COPCs in Groundwater should start with a reference to the regional hydrogeology. This section should start with an overview of the regional hydrogeology that describes sources of water, recharge areas, and discharge areas including from large production wells within the Las Vegas Valley. It should also include a description of general groundwater movement within shallow and deep valley fill deposits within the valley and how regional groundwater movement relates to local site conditions. In addition to citing estimated hydraulic conductivities and flow velocities, the relative change in hydraulic gradient within the OUs and various water bearing zones should be provided as gradient also plays a role in groundwater velocity.	A summary of regional hydrogeology will be added to Section 8.0 and Section 5.5 (see Comment 7.1) in Revision 1 of the RI Report that includes the requested items. The summary will be based on publicly available published reports.	While paleochannels by themselves tend to have greater conductivity than the strata into which they are incised, the soil deposited within the paleochannel itself can have a range of hydraulic conductivity over several orders of magnitude. The distribution of the soils within the paleochannels needs to be better defined. Similarly, the distribution of fine and coarse units of the Muddy Creek, how the various facies are distributed based on a depositional model, and how these facies subsequently confine or partially confine groundwater need to be further explained.
1.5.1) Changes in groundwater levels and flows may be due to the Groundwater Extraction Systems (GWETS) and changes in pond usage. NDEP suggests presenting the interpretation of historic groundwater elevations and flow directions for the periods such as pre-1940, 1940 - 1980, 1980 - 2000, 2000 - Present to help in better understanding historic COPC migration.	Historic groundwater elevations and flow directions prior to 1980 can only be discussed conceptually since groundwater elevation data prior to the 1980s is very limited. Based on the earliest groundwater elevation data available for OU-1 presented by Kerr-McGee in the 1985 report titled *Geohydrological Investigation, Kerr-McGee Chemical Corporation, Henderson Facility, July 1985*, the historical groundwater flow direction is consistent with the maps provided in	It would be helpful if the maps can be added to the report.

NDEP Comment	Response	NDEP Comment on Response
	the RI Report. In addition to the abovementioned report, NERT has acquired elevation maps from 1971, 1980, 1984, 1987, and 1998, and such maps, along with limited discussion, can be added to the RI Report.	
1.5.2) The discussion of water bearing zones should be related to the hydrogeology and sequence stratigraphy described in the prior Section and used to explain hydraulic communication laterally through the sediments and areas of unconfined, semiconfined, and confined groundwater conditions.	An evaluation of the water bearing zones and lateral hydraulic communication within stratigraphic units identified across the NERT RI Study Area will be conducted as part of the updated conceptual site model to be developed as part of the RI Report for OU-3. Section 5.5.1 of the RI Report provides a summary of how paleochannels serve as preferential flow pathways and affect groundwater flow in OU-1 and OU-2. Therefore, Revision 1 of the RI Report will not be updated to reflect this comment.	The response is acceptable pending review of the revised
1.5.3) Because the coarse units of UMCf play a significant role in the contamination migration, NDEP suggests more details on their spatial distribution based on the remediation investigation boring and NMR data.	Additional discussion and reference to cross-sections illustrating the extent of the coarse units in the UMCf can be added to Revision 1 of the RI Report consistent with this comment.	The response is acceptable pending review of the revised report.
1.6) Groundwater Metals Figures. Upgradient concentrations for metals mentioned in the text should also be noted on each figure where the parameter has an established upgradient concentration.	Revision 1 of the RI Report can include revised figures for metals consistent with this comment. The figures for metals in groundwater will be revised to include the established upgradient concentration as appropriate. This would only apply to figures for arsenic because arsenic is the only metal that has an upgradient concentration established by NDEP.	The response is acceptable pending review of the revised report.
1.7) Section 9: Conceptual Site Model. Additional Figures: The sources of contamination described in Section 9.4 appear comprehensive, including the description of trespassing chemicals. The text in Section 9.0 is well written and complete, and the first three figures in Section 9.0 do a good job of illustrating the overall site features. However, the conceptual model should include more figures describing/presenting the interactions between sources of contamination, NAPL, groundwater, and geology to explicitly state what transport pathways and attenuation mechanisms are occurring, and which ones are most important. There are multiple contaminant sources in the study area, and the visual depiction of the interactions could be presented with more clarity using several conceptual figures in this section, to support the information already presented	Additional conceptual figures illustrating contaminant sources and migration pathways can be added to Section 9 of Revision 1 of the RI Report consistent with this comment. See the response to Comment 11.9 for specific details.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
in the text of Section 9.0.		
1.8) Intercept Well Field: It appears the combination of well fields capture the plume(s). But is there any concern that the Interceptor Well Field should be doing more? If the Interceptor Well Field was doing more would there be less need for reliance on the AWF and SWF? This is something that should be addressed during the FS.	The effectiveness of the Interceptor Well Field (IWF) will be discussed in the forthcoming Feasibility Study (FS) for OU-1 and OU-2. However, please note that the IWF is currently operating at its maximum capacity. Additional details can be found in the Annual Groundwater Monitoring and GWETS Performance Report submitted to NDEP on May 27, 2022. Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	The response is acceptable pending review of the revised report.
1.9) FS Limitations: The RI concludes by discussing NERT's intent to limit the Feasibility Study (FS) to COPCs originating from or attributed to NERT. It may be technically infeasible to achieve this. This language should be modified with "to the extent technically feasible".	NERT will revise the text in Revision 1 of the RI Report to include this caveat. This, in consideration with the limitations on the use of the Trust's funds, will be further discussed in the FS.	NDEP will work with other responsible parties to address in their FSs and remediation plans any COPCs that are trespassing onto the NERT site.
	2. Executive Summary	
2.1) "Summary of COPCs for OU-1 and OU-2" on P. ES-3: It would be helpful to cite a figure or figures that show the areas that are discussed.	NERT can add a new figure to the Executive Summary section in Revision 1 of the RI Report, adapted from Figure 9-4, which shows the COPCs for each of the RI Study Areas and Sub-Areas.	The response is acceptable pending review of the revised report. if Figure is added
2.2) "OU-1 Sources of Contamination" on P. ES-4: This section refers to the Beta Ditch shown on Figure ES-4, but it is difficult to find the Beta Ditch in that figure. Suggest making the label of the Beta Ditch on Figure ES-4 easier to read.	NERT can revise Figure ES-4 in Revision 1 of the RI Report so that the Beta Ditch label is more prominent and legible.	The response is acceptable pending review of the revised report. if figure is revised
2.3) "Former AP Plant and Associated Facilities" on P. ES-6		The response is acceptable pending review of the revised report if figure is revised.
2.3.1) This section states that the AP Plant, associated waste containment ponds, and other facilities were located in the northern half of OU-1 south of the IWF/barrier wall and refers to Figure ES-4, but it is not clear from Figure ES-4 where the IWF/barrier wall is.	NERT can revise Figure ES-4 in Revision 1 of the RI Report to include a symbol and a label for the IWF/Barrier Wall.	The response is acceptable pending review of the revised
2.3.2) This section states that after closure of the AP-5 Pond, investigation results showed perchlorate concentrations above 1 mg/L in underlying groundwater to a depth of approximately 85 feet. How much above 1 mg/L were the perchlorate	The Executive Summary section provides a general overview of site conditions, including concentration data. Additional detailed discussion of perchlorate distribution is included within Section 7 (Section 7.5.1.1 and Figures 7-44a through 7-44g), as well as Plate C-4b (cross-section D-D') within Appendix C. As shown in Plate C-	Instead of relying on a reader finding information regarding the highest concentration of perchlorate that is in Plate C-4b buried in an Appendix to the RI

NDEP Comment	Response	NDEP Comment on Response
concentrations? Note this same statement is in Section 9.4.3 on P. 9-21.	4b, perchlorate is present above 1 milligrams/liter (mg/L) to a depth of approximately 85 feet below ground surface (bgs). The highest concentration of perchlorate in groundwater at this location was 950 mg/L between 60 and 70 feet bgs. At a depth interval of 90 to 100 feet bgs perchlorate in groundwater at this location was 0.6 mg/L. Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	Report, the following information should be added to the section "Former AP Plant and Associated Facilities" on p. ES-6 and to Section 9.4.3 on p. 9-21: "The highest concentration of perchlorate in groundwater at this location was 950 mg/L between 60 and 70 feet bgs. At a depth interval of 90 to 100 feet bgs, perchlorate in groundwater at this location was 0.6 mg/L."
2.4) "OU-1 Soil Gas" on P. ES-9: ". . . TCE in groundwater originating in and extending from the Western Area Power Administration (WAPA) property" should be changed to ". . . TCE in groundwater originating in and trespassing from the Western Area Power Administration (WAPA) property" similar to the description above of groundwater contamination that is "trespassing from the OSSM site."	Revision 1 of the RI Report will be revised consistent with this comment.	The response is acceptable pending review of the revised
2.5) "OU-2 Sources of Contamination" on P. ES-10: Should add a figure which shows the sources of contamination in OU-2, similar to how Figure ES-4 shows the historical sources of contamination in OU-1.	NERT can add a new figure to the Executive Summary section in Revision 1 of the RI Report to depict historical sources of contamination within OU-2. This figure will identify the sources of contamination external to OU-2: the Beta Ditch, Alpha Ditch, Northwestern Ditch, Upper BMI Ponds, and contamination migrating from OU-1 and upgradient sites (i.e., Olin, Stauffer, Syngenta, and Montrose [OSSM], Titanium Metals Corporation of America [TIMET], former American Pacific Corporation [AMPAC]). However, this figure will not show specific sources within the abovementioned properties outside of the NERT RI Study Area.	The response is acceptable pending review of the revised
2.6) "Sources of Contamination within OU-2 West of Pabco Road (NERT Off-Site Study Area)" on P. ES-10: What were the commercial purposes of the land use in the NERT Off- Site Study Area within OU-2? What was the basis for determining they could not be the source of any Site-related contamination within the area?	While NERT has not completed a comprehensive survey of each property and property's history within OU-2, the area is currently occupied by a combination of casinos, gas stations, and retail stores; automobile sales, parts, and wrecking operations; a large data center; and a wide variety of other small businesses. While some operations could result in local soil or groundwater contamination, none of the identified operations are likely to have significantly contributed to the wide-spread distribution of upgradient COPCs identified within OU-2. As part of the RI, and consistent with EPA guidance, a screening	The response is acceptable pending review of the revised

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	evaluation was completed for COPCs in groundwater within OU-1. The screening identified COPCs that were present at the downgradient boundary of OU-1 and could therefore migrate into OU-2. The same COPC screening evaluation was then completed for chemicals in OU-2 groundwater. Based on the distribution of COPCs in OU-2 and the particle tracking presented in Section 9 (Figures 9-7a, 9-7b, and 9-7c), the source(s) for each OU-2 COPC were accounted for within OU-1 or neighboring upgradient properties. COPC concentration gradients clearly indicate that properties in OU-2 do not have an observable impact on groundwater quality. All COPCs in OU-2 clearly originate from OU-1 or other upgradient sources as identified above. In addition, there is no evidence that Kerr-McGee or Tronox had any operations within OU-2. Additional language to this effect will be added to Section 9 of Revision 1 to the RI Report to reflect this comment.	
2.6.1) Paragraph starting with "Sufficient data" on P. ES-11: The text refers to "hexavalent chromium," but Figure ES-5 refers to "Chromium." The references should be consistent.	The referenced text in Revision 1 of the RI Report will be updated to refer to "chromium" rather than "hexavalent chromium" for consistency with Figure ES-5. As noted in footnote 42 within the RI report, "a detailed analysis of hexavalent chromium to total chromium ratios was performed as part of the 2016 Groundwater Monitoring Optimization Plan (Ramboll Environ 2016). 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). With NDEP approval, hexavalent chromium was generally eliminated from NERT's on- going monitoring program in 2016. 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)."	The response is acceptable pending review of the revised
2.6.2) The typo "COCPs" should be corrected to "COPCs." This same typo is in the second bullet on P. 6-10.	NERT will revise the text in Revision 1 of the RI Report consistent with this comment.	The response is acceptable pending review of the revised
2.7) "Sources of Contamination within OU-2 East of Pabco Road (Eastside Sub-Area)" on P. ES-12: It would be helpful to cite to a figure that shows the features that are described in the text.	As described in response to comment 2.5, a figure can be added to Revision 1 of the RI Report to depict the sources of contamination within OU-2, including the Beta Ditch, Alpha Ditch, Northwestern Ditch, Upper BMI Ponds, and contamination migrating from OU-1 and upgradient sites (i.e., OSSM, TIMET, former AMPAC). However, this	The response is acceptable pending review of the revised

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	figure will not show specific sources within the above-mentioned properties outside of the NERT RI Study Area.	
2.8) "OU-2 Soil Gas" on P. ES-14: Though bromodichloromethane is a COPC in OU-1 and OU-2 groundwater, its isolated presence in OU-2 soil gas is likely related to municipal water distribution and use." Bromodichloromethane has historic sources other than the chlorination of drinking water supplies, such as a flame retardant, being a fire extinguisher ingredient, and as a heavy liquid for mineral and salt separations. Please provide stronger support for limiting the source of bromodichloromethane to municipal water use and distribution.	Bromodichloromethane was detected in groundwater at very limited locations along the northern boundary of OU-1 and the southern boundary of OU-2 as shown in Figures 7-66a and 8-17a. Bromodichloromethane concentrations above the soil gas screening levels are not co-located with these elevated concentrations in groundwater (see RISG-74 soil gas concentrations in Tables 8-4c and 8-4d and the location of RISG- 74 in Figure 8-30a). Therefore, the elevated soil gas concentrations at RISG-74 are not associated with historical operations in OU-1. While some of the additional sources mentioned in the comment may be responsible for this elevated constituent in soil gas, since this is in a residential area, municipal water appears to be the most likely source. Additional text will be added to Sections 8 and 9 of Revision 1 of the RI Report elaborating on this.	The results from RISG-74 appear to be an outlier when compared to other RISG sites, but further investigation is needed before bromodichloromethane can be attributed solely to drinking water supplies.
3. Introduction		
3.0) P. 1-3, first full paragraph: "This first removal action included the construction of a groundwater treatment system for removal of hexavalent chromium from groundwater, which was constructed in 1987 within OU-1." What first removal action is being referenced here? The prior sentence states that extensive environmental investigations and removal actions have taken place since the 1970s, but this sentence says the groundwater treatment system was constructed in 1987. Should "This first removal action" be changed to "One of the first removal actions"?	The referenced paragraph in Revision 1 of the RI Report will be edited so that the first sentence only refers to the timing of the first environmental investigations, which took place in the 1970s. A second sentence will then refer to the first removal action within OU-1, installation of the IWF and construction of the groundwater treatment plant, which took place in 1987.	
4. NERT RI Study Area History		

NDEP Comment	Response	NDEP Comment on Response
4.1) Section 2.1.1, 2.1.2, 2.1.4 OU-1 History P. 2-2, through 2-9. There is an absence of an examination of historical operations in these sections to evaluate whether chemical reactions could have produced other by products not recorded in the reports and the possible inclusion of these byproducts as COPCs. Please provide a discussion of the chemical byproducts from the processes described in these sections. For example, gases generated in the chlorinators would have contained chlorinated organic chemicals such as chloroform. Please expand on whether byproducts were evaluated as COPCs.	Please see NERT's response to Comment 1.2.	The response is acceptable pending review of the revised report.
4.2) Section 2.1.4 OU-1 History from 1967 to 2005 P. 2-11, Paragraph 2. Note that the onsite landfill operated from 1980-1983 was used for the disposal of sodium chlorate filter cakes that could have contained chlorinated organic chemicals. Please add this fact to this section.	NERT can revise the text in Revision 1 of the RI Report consistent with this comment. Please note that this material was removed by Tronox during the soil removal action in 2010 and 2011 and disposed offsite.	The response is acceptable pending review of the revised report once text is revised
4.3) Section 2.1.3, "OU-1 History from Approximately 1951 to 1967" on P. 2-7, first paragraph: What is the "eluant" from the crystallizer?	The term "eluant" was used for consistency because it was a term used in previous reports presenting OU-1 history. "Eluant" refers to the solution that ammonium perchlorate crystals were grown in after the crystals were removed. Revision 1 of the RI Report can be edited to define this term.	The response is acceptable pending review of the revised report once text is revised
4.4) Section 2.1.5, "OU-1 History from 2005 to Present" on P. 2-12: "NERT has no oversight role with respect to EMD's facility operations, ponds, and associated permits." Doesn't NERT check to make sure that EMD's operations are not causing any contamination at the NERT site?	Although NERT does not have an obligation to oversee EMD's operations, NERT monitors activities within the Leasehold through implementation of the Site Management Plan (SMP), which requires work plans for soil disturbing activities. These work plans are reviewed by NERT and submitted to NDEP for approval. EMD provides an annual certification of SMP compliance and provides work plans and reports for projects conducted under the SMP. Additionally, EMD must notify NERT if a spill occurs, and EMD must copy NERT on all spill-related correspondence with NDEP. The Lease between NERT and EMD obligates EMD to notify NERT of small construction projects and receive approval for any large construction projects. Under the lease, EMD is obligated to comply with all environmental laws and has "due care" obligations not to exacerbate any of the existing Henderson Legacy Conditions (HLCs).	Revision 1 of the RI Report should include the following information (which is taken from NERT's response to NDEP's comment): "Although NERT does not have an obligation to oversee EMD's operations, NERT monitors activities within the Leasehold through implementation of the Site Management Plan (SMP), which requires work plans for soil disturbing activities. These work plans are reviewed by NERT and submitted to NDEP for approval.

NDEP Comment	Response	NDEP Comment on Response
	Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	EMD provides an annual certification of SMP compliance and provides work plans and reports for projects conducted under the SMP. Additionally, EMD must notify NERT if a spill occurs, and EMD must copy NERT on all spill-related correspondence with NDEP."
4.5) Section 2.2.1 Olin/Pioneer/Stauffer/Montrose History Pages 2-14, 2-15, 2-16 and 2-17. In addition to the chlorine production wastes listed, cell sludge containing highly chlorinated organic chemicals (DNAPL) would have been produced. Prior to 1958, the chlorine would have contained volatile chlorinated organic chemicals including chloroform and carbon tetrachloride. The brine sludge, asbestos and cell parts would have chlorinated organic chemicals present. This information should be added to the report.	The NERT RI Report includes sufficient material (four pages of text describing the operational history at the OSSM site) to describe the overall nature of chemical manufacturing at OSSM as it relates to the objective of the NERT RI Report. Additional information is not necessary to support NERT's conclusions regarding the nature and extent of contamination and the ongoing trespass of the OSSM plume into OU-1. Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	The response is acceptable, although the additional information requested would be helpful because it would complete the operational history
4.6) Section 2.3.1, "OU-2 West of Pabco Road: History from 1940s to Present" on P. 2-20: This section discusses the Northwest Ditch and the Alpha Ditch, but it is difficult to see those ditches on Figure 2-9. Suggest using a white background for the blue font in the labels in the figure.	NERT can revise Figure 2-9 in Revision 1 of the RI Report so that the Alpha and Northwest Ditch labels are more prominent.	The response is acceptable pending review of the revised report once text is revised
4.7) Section 2.4.1 and Table 2-3 should also reference the City of Henderson (COH) Wastewater treatment plant #1 that in the 1950s discharged 1 to 1.5 mgd to two ponds (1 lined and 1 unlined) near the facility, as well as to the evaporation and percolation ponds (EPP; now known as the Bird Viewing Preserve and later (1983) Wastewater treatment plant #3 with a capacity of 6.3 mgd that discharged wastewater to the EPP and the Pabco Ribs) (see UNLV, 2003, P. A-36). This is relevant as the ponding of water in this area increased groundwater levels that apparently influenced groundwater levels and flow south of the Athens Road well field.	NERT can revise the text in Revision 1 of the RI Report consistent with this comment regarding the location of COH Wastewater treatment plant #1. A brief description of the COH wastewater treatment plants and evaporation ponds, which are located within OU-3, will be added to Section 2.4.1 and Table 2-3 of the RI Report. Please note that discharges from these wastewater features would influence groundwater flows north of the AWF, rather than south of the AWF. Since any influence on groundwater flow would be in OU-3, no changes regarding the ponds influence on groundwater flow will be made to this report but will instead be addressed in the forthcoming RI Report for OU-3.	The point is that groundwater flow northward through the paleochannel from OU-1 and OU-2 was influenced by the mounding of water at the COH ponds. This is an important concept that relates to the timing for the spread of perchlorate in this area and when high concentrations of perchlorate from the NERT site reached the Las Vegas Wash.
5. Regulatory Actions, Environmental Investigations, and Remedial Actions		

NDEP Comment	Response	NDEP Comment on Response
5.1) "The Seep Area Groundwater Characterization Report (Kerr-McGee 2001)" on P. 3-6: It would be helpful to cite to a figure here.	A reference to Figure 3-5 can be added within the text of Revision 1 to the RI Report, which shows the locations of features discussed in the description of the Seep Area Groundwater Characterization Report prepared by Kerr-McGee in 2001.	The response is acceptable pending review of the revised report.
5.2) Section 3.3.2, "Environmental Investigation/Remediation Conducted by NERT" on P. 3-16: "This excavation area is shown on Figure 3-2." It is difficult to see where this excavation area and the Beta Ditch are in Figure 3-2.	Figure 3-2 in Revision 1 of the RI Report will be revised so that labels for all the polygons and Beta Ditch are more prominent. A reference will also be added to Figure 3-3, which depicts the remediation status of each polygon.	The response is acceptable pending review of the revised report.
5.3) "The Continuous Optimization Program (COP)" on P. 3-17: Should clarify that the supplementary IX system near the SWF is still operating.	A sentence can be added to the referenced page in Revision 1 of the RI Report to clarify that NERT's IX system continues to operate and treat water extracted from a portion of the SWF.	The response is acceptable pending review of the revised report.
5.4) "Closure of the AP-5 Pond" on P. 3-19: "The pond's location within OU-1 is shown on Figure 3-5." It is difficult to find the AP-5 Pond on Figure 3-5.	A clarifying description will be added to the referenced page in Revision 1 of the RI Report indicating that AP-5's location is shown south of the IWF and east of the AP Area Extraction wells and can be found in the inset of the IWF at the lower left corner of the referenced figure.	The response is acceptable pending review of the revised report.
5.5) "AP-5 was closed in order to comply with the Site's Groundwater Discharge Permit (NEV2201515)." This sentence is somewhat ambiguous and could be misleading. This sentence should be revised as follows: "The Site's Groundwater Discharge Permit (NEV2201515) required the primary liner system to be free of leaks. Because there was a leak in the primary liner system for AP-5, NERT could have either: (1) removed the solids in order to repair the leak and maintain compliance with the permit, or (2) closed AP-5 and removed it from the permit, and NERT chose the second option."	Revision 1 of the RI Report will be revised consistent with this comment.	The response is acceptable pending review of the revised report.
5.6) Section 3.3.4, "NERT's Current Groundwater Extraction and Treatment System", P. 3-20: This section should discuss NERT's GWETS Extension project.	Acknowledging that the design of the GWETS Treatment System Extension (TSE) was not finalized at the time the RI Report was initially submitted to NDEP, Revision 1 of the RI Report can be revised to include discussion of the TSE and its treatment of NERT's COPCs in groundwater at the neighboring TIMET site.	The response is acceptable pending review of the revised report.
5.6.1) P. 3-21: First paragraph should cite to Figure 3-5 which shows the location of the GWETS IX treatment system.	Revision 1 of the RI Report can be revised consistent with this comment.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
6. Remedial Action Objectives		
6.0) NDEP suggests that NERT include California's PHG of 1 µg/L for perchlorate and California's MCL for total chromium of 50 µg/L in drinking water as a TBC criterion for remedial action objectives (RAOs) given that RAOs "focus on achieving the Trust's overarching objective of protecting the Las Vegas Wash and downstream interests over a long-time frame (i.e., greater than five years)" and "help achieve out- of-state MCLs at downstream state boundaries."	Pursuant to the Interim Consent Agreement, NERT must perform the RI consistent with the NCP. Under CERCLA, to qualify as an ARAR, a requirement either has to be applicable or relevant and appropriate. To be applicable, the requirement must be a promulgated federal or state standard that addresses the contaminant in a specific location. To be relevant and appropriate, the requirement must be a promulgated federal or state standard that isn't applicable to the specific circumstances, but sufficiently similar and the use would be well suited for the particular site. A TBC is not promulgated, but is typically equivalent to final agency guidance and most often used when there isn't an ARAR for a particular situation or to interpret federal/state law. With regard to total chromium, the chemical specific ARAR is the federal MCL, which has been adopted by Nevada. A California MCL is a promulgated standard and therefore would be an ARAR and not a TBC; however, it would not be an ARAR for the NERT site as the specific location (i.e., the point of compliance for a California drinking water standard) would be when the water leaves the municipal water purveyor in California, not a remediation project in Nevada. With regard to perchlorate, there isn't a chemical specific ARAR, but there is a TBC, the Interim Drinking Water Health Advisory and federal preliminary remediation goal of 15 ug/L. For California's perchlorate PHG to be a TBC, it must be equivalent to a final agency action. It is our understanding that a PHG is not close to a final action as there are still technical and economic analysis that need to be performed and to the extent there is a final agency action, it will be in the form of a California MCL, which would not be applicable to a remediation project in Nevada. While NERT does not agree that the California MCL and PHG are TBCs, NERT can update the last paragraph of Section 4.1 to reflect the current status of California's regulation of perchlorate and chromium.	The Nevada Division of Environmental Protection (NDEP) and the U.S. Environmental Protection Agency (EPA) directs Nevada Environmental Response Trust (NERT) to use California's current MCLs of 6 µg/L for perchlorate and 50 µg/L for total chromium as Applicable or Relevant and Appropriate Requirements (ARARs) and California's Public Health Goal (PHG) for perchlorate of 1 µg/L and California's proposed MCL of 10 ug/L for hexavalent chromium as TBCs for RAOs at the California state line. Further NDEP and US EPA and Metropolitan Water District of California have examined and conclude that using other states MCLs and health goals for ARAR and TBC for the RAO at the state boundary to be consistent with the Comprehensive Environmental Response, Compensation, and Liability Act and the National Contingency Plan.
7. Section 5.5: Hydrogeology		
7.1) This section should start with an overview of the regional hydrogeology that describes sources of water, recharge areas, and discharge areas including from large production wells within the Las Vegas Valley. It should also include a description of general groundwater movement within shallow and deep valley fill deposits within the valley and how regional	Revision 1 of the RI Report will include a summary of regional hydrogeology to both Section 5.5 and Section 8.0 (see Comment 1.5) that contains the requested items. The summary will be based on publicly available published reports.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
groundwater movement relates to local site conditions. For instance, it is noted in Section 5.5.1 that: "..recent groundwater elevations measured during annual groundwater monitoring events show that, except for a few small areas, the alluvium has become dewatered and first groundwater now occurs within the UMCf."		
7.2) Figure 5-4 Surficial Geology: The legend doesn't identify the various stratigraphic units shown on the geologic map used as a background for the figure. Are the variations in surficial geology important for the understanding of the CSM? If so, then the figure should include a legend for the units. But if it is not important to know what each of the units are, then this should be clarified in the text and can be left of the figure.	Figure 5-4 in Revision 1 of the RI Report will be revised to include a legend for the geologic units.	The response is acceptable pending review of the revised report.
7.3) Figure 5-5 Conceptual Geologic Model for the Muddy Creek Formation: A general outline of the site should be placed on the generalized model, much like on Figure 9-1, to help the reader place the site geology on the subsequent cross sections into the context of the overall conceptual stratigraphic model.	Figure 5-5 in Revision 1 of the RI Report will be revised to show the locations of the site OUs relative to the generalized geologic model.	The response is acceptable pending review of the revised report.
7.4) Figure 5-7 Subsurface Cross Section M-M': The various silty sand units depicted in the UMCf fg1 are presented as discontinuous lenses having a similar slope to the ground surface. Given the likely genesis mechanism of these deposits, is it possible that some of them could be interconnected? Please explain if interconnectivity is a factor, and if so how it relates to the transport of contaminants in the UMCf fg1. It would be helpful to have a 3D geological block map to display the silty sand units for entire study area.	Figure 9-3 presents a South to North Subsurface Cross-Section from OU-1 to the Las Vegas Wash showing perchlorate concentrations with depth. Although the scale in Figure 9-3 is compressed, the referenced Subsurface Cross-Section M-M’ forms the left side of the cross-section in Figure 9-3, and the same discontinuous silty sand units are shown. As can be seen on Figure 9-3, the deeper discontinuous silty sand units within the UMCf are below the vertical extent of perchlorate as defined by the NDEP BCL of 0.015 mg/L. Therefore, even if some of these units were interconnected, they would not serve as site- related contaminant migration pathways. In addition, discontinuous silty sand units are rarely encountered within the UMCf in the northern portion of OU-2 and OU-3. Additional discussion will be added to Section 9.2.3 of Revision 1 to the RI Report as summarized above.	The response is acceptable pending review of the revised report.
7.5) Section 5.5.1 Shallow Water Bearing Zone P.5-9, paragraph 5. The text indicates that the depth to groundwater in the northern portion of OU-1 is 30 feet bgs, and the depth to groundwater in the southern part of OU-2 be 60 feet bgs. These two areas are adjacent, groundwater flows to the north and the land surface	The text in Section 5.5 of Revision 1 of the RI Report will be clarified to identify the locations being referred to in the text.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
slopes downward to the north. Please clarify the locations in the OUs that are being referred to in the text.		
7.6) Section 5.5.1 Shallow Water Bearing Zone P. 5-10 and Appendix D Aquifer Testing Results. The text indicates that the geometric mean of the hydraulic conductivity values for wells screened across both the alluvium and UMCf was 4.4 ft/day. If a well is screened across both high K and low K zones, then the bulk of the hydraulic response will be from the high K zone, and the resulting hydraulic conductivity value will not be representative of an average of the two zones. Please explain the significance of the difference between the geometric mean calculated versus the majority of hydraulic response coming from the high K zone.	The text in Section 5.5.1 of Revision 1 of the RI Report will be modified to provide further clarification in response to this comment, and Appendix D will be modified to explain how to interpret the geometric mean hydraulic conductivity for cross- screened wells.	The response is acceptable pending review of the revised report.
7.7) Section 5.5.1 Shallow Water Bearing Zone P. 5-10, paragraph 2. Given that several extraction well fields have been installed at the site and that historic discharge to unlined ponds and ditches may have caused groundwater mounding it is likely that groundwater flow directions have shifted from the time of COPC release to current conditions. Presenting the interpretation of historic groundwater elevations and flow directions would be helpful in better understanding historic COPC migration.	Limited data are available prior to 1980 when the historic discharges to unlined ponds and ditches occurred. A conceptual discussion of possible historic changes in groundwater flow directions related to groundwater mounding beneath unlined ponds and ditches and the more recent operation of extraction well fields can be added to Revision 1 of the RI Report. However, given that there is no groundwater elevation data available prior to 1985, this discussion will be of limited value. After the GWETS was installed, there is more information available, but it is still limited in nature until approximately 2000. Furthermore, based on the information available, it does not appear that unlined ponds had a significant impact on groundwater flow direction once the GWETS was initiated given the relatively small size of the ponds at that time.	Response accepted. Assuming there is limited data to demonstrate the historical change in groundwater flow directions the qualitative discussion in Section 5.5.4 regarding historically increased groundwater elevations and downward gradients is sufficient as it pertains to historic migration of COPCs.
7.8) Section 5.5.2 Middle Water Bearing Zone, P. 5-10, paragraph 2. The text states that Figure 5-13b shows a "change in groundwater flow direction toward the northeast, particularly in OU-3" for the Middle Water Bearing Zone 90-130 ft bgs. Examination of the figure reveals a lack of data over most of OU-3, as indicated by the generous sprinkling of "?" on the contour lines, suggesting that this statement should be targeted to specific areas where data exists to support it (e.g., near the bird viewing ponds and the northeast reaches of	The text in Section 5.5.2 of Revision 1 of the RI Report will be revised to include more specific language regarding the areas where data exist to support the interpretation of groundwater flow directions. The forthcoming RI Report for OU-3 will include additional data from wells installed within OU-3 as part of the recent Phase 3 RI. However, since the vertical extent of contamination generally does not extend below 90 feet bgs, NERT does not believe that a data gap exists because refining the understanding of groundwater flow direction in the Middle Water Bearing Zone is not necessary to complete the RI or the FS and subsequent remedy selection.	The planned response is accepted pending review of the final report.

NDEP Comment	Response	NDEP Comment on Response
OU-3 near the wash). Additionally, water level data from the southeast corner of OU-3 near well ES-18 suggests a northwest flow direction in this part of OU-3, as indicated by the contour lines in the referenced figure. The same applies to the statement in the third paragraph of 5.5.2 which concerns the Middle Water Bearing Zone 130-175 ft bgs.		
7.9) Section 5.5.2 Middle Water Bearing Zone P. 5-11, paragraph 2. The range of groundwater velocity values presented for the Middle WBZ (40-1,900 ft/yr) are assumed to be from the calibrated groundwater model. The upper range of these values is similar to the values for the alluvium (1,700-6,000 ft/yr), even though the hydraulic conductivity values referenced for the Middle WBZ are orders of magnitude lower than the values for the alluvium. The hydraulic conductivity values presented in the text are from single-well response tests and may underestimate the true hydraulic conductivity of the formation. If the groundwater velocity in the text is the calibrated groundwater velocity, then the calibrated hydraulic conductivity value must be much higher, because the groundwater velocity stated in the text cannot be calculated based on the hydraulic conductivity value stated in the text. This discrepancy should be addressed in the text. The text includes several numbers that would be better presented as tables to simplify the text and clarify the numbers.	The text in Section 5.5.2 of Revision 1 of the RI Report will be revised to provide additional explanation of the source of the groundwater velocity and hydraulic property estimates which will resolve the discrepancy noted in this comment.	The response is acceptable pending review of the revised report.
7.10) Appendix D Aquifer Testing Results Section D.2.1 Operable Unit 1 History P. D-2. Artesian (or flowing artesian) conditions do not prevent the completion of slug tests - a temporary riser extension can be attached to the well casing. Suggest changing the text to read "slug tests were not conducted" instead of "slug tests could not be conducted."	The text in Section D.2.1 of Revision 1 of the RI Report will be revised consistent with this comment.	The response is acceptable pending review of the revised report.
7.11) Appendix D Aquifer Testing Results Section D.2.2 Major Chemical Manufacturing Operations Adjacent to Operable Unit 1. Please explain why an arbitrary 10 feet was added to the saturated thickness	An explanation for the adjustment to the saturated thickness of the alluvium will be added to Section D.2.2 of Revision 1 of the RI Report.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
for the alluvial well tests. A smaller saturated thickness would result in a slightly higher hydraulic conductivity.		
7.12) Appendix D Aquifer Testing Results Section D.2.3 Operable Unit 2 History. Please explain what is meant by "The averages of the most reliable slug testing results from each well tested." How was the "reliability" of the slug tests determined?	The text in Section D.2.3 of Revision 1 of the RI Report will be revised to indicate that the reliability was judged by the goodness-of-fit between the data and the slug test model.	The response is acceptable pending review of the revised report.
7.13) Appendix D, Aquifer Testing Results Section D.2.3 Operable Unit 2 History. The text indicates that "In general, the K declines with depth." The plot of K value vs depth Z (Figure D-3 Hydraulic Conductivity vs Screen Depth) shows that the shallow alluvial material has generally higher K values than the deeper UMCf, this is to be expected, because the alluvium is coarser grained, and the UMCf is more fine grained. But there is no obvious correlation with depth in the UMCf; the K values vary by orders of magnitude within the same depth range. Please revise the text to clarify this distinction. Because the subsurface includes anastomosing streams, where there are discrete zones of higher K that can act as preferential flow paths, averaging K values (or using a geometric mean) may not be appropriate. Please justify the use of the average K values.	The text in Section D.2.3 of Revision 1 of the RI Report will be revised to clarify the statistical correlation between K and depth. The comparison of average K values among the different geologic units was provided as a simple statistical summary of the large K dataset collected from throughout the RI Study Area. The effect of anastomosing streams would be limited to much smaller areas. In addition, as described in the response to Comment 7.4, there is no indication that preferential flow paths exist that extend throughout the entire RI Study Area. Thus, the use of geometric means to summarize the aquifer testing results is justified.	If the relationship of K with depth is critical to NERT's CSM, then please clarify in the text that, as presented on Figure 4.3, there is no apparent correlation between K and depth within the UMCf. If the relationship of K with depth is not critical to the CSM, then please remove this comment from the report. Please also acknowledge in the text that while there are no identified area-wide preferential flowpaths, there may be areas of higher K that locally affect contaminant transport, and that the average K values presented are for information and may not applicable everywhere on the site
7.14) Section 5.5.1 Shallow Water Bearing Zone P. 5-10, paragraph 3. Please provide an example calculation for groundwater velocity in the shallow WBZ. Using the data provided in the last paragraph of this section, including the alluvium hydraulic conductivity (K= 7.1x10-3 cm/s), the gradient shown on Figure 5-12c (0.015 ft/ft), along with an assumed porosity of 0.10, v = Ki/n, would result in a groundwater velocity of almost 1,100 feet/year. But the paragraph indicates that the groundwater velocity values from the groundwater model are between 1,700 and 6,000 ft/yr. The same is observed for flow	The text in Section 5.5.1 of Revision 1 of the RI Report will be revised to provide a more thorough explanation of the origin of the groundwater velocity estimates and to clarify differences between the groundwater model and measured hydraulic property data. In general, the groundwater model estimates are considered to be more representative of the range of groundwater velocities within the OUs as compared to estimates based on the point-measurements of hydraulic conductivity. This is because the groundwater model integrates the effect of hydraulic properties along the entire flow path and was developed considering all of the available data.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
in UMCf cg2 where the measured hydraulic conductivity at TR-9 is 2.9 ft/d and a gradient of 0.015 ft/ft and assumed porosity of 0.24 would result in a groundwater velocity of 66 ft/yr yet a range of 470 to 1,900 ft/yr is reported based on the groundwater model. Are the groundwater travel times cited from the model consistent with other site observations? Please revise the text to clarify this apparent discrepancy or explain why the calibrated numerical model results are appropriate.		
7.15) Figure 5-12b/c Potentiometric Surface Map, Shallow WBZ. The paleochannels are identified as an important migration pathway in the CSM. These should be included on the Shallow WBZ figures and incorporated into the piezometric surface, as far as they affect the groundwater flow and contaminant transport.	Both Figures 5-12b (OU-1) and 5-12c (OU-2) illustrate the potentiometric surface in the lower Shallow WBZ depth interval of 55-90 ft bgs. Since the majority of these wells are screened in the UMCf at depths below the influence of the paleochannels, the paleochannels were not illustrated on these figures. The paleochannels affect groundwater flow in the Shallow Groundwater Table Zone and are therefore shown on Figure 5-12a, which shows the groundwater table contour map for the entire RI Study Area. Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	Please provide a CSM figure that shows how the paleochannels affect flow and distribution of the plume. A better description of the occurrence and distribution of stratigraphic facies within the paleochannels and for the Muddy Creek and how these deposits affect groundwater occurrence would improve the reader's understanding of the piezometric surface.
7.16) Section 5.5.4 Shallow Water Bearing Zone pages 5-12 and 5-13, Paragraph 6. Please confirm that the downward hydraulic gradients in the pilot scale areas, when there are natural upward gradients in the rest of the study area caused by the extraction systems in the area including the AMPAC. What is the effect of the surface water impoundments (like the COH Birding Ponds) on the vertical gradients?	The text in Section 5.5.4 in Revision 1 of the RI Report will be revised to provide additional discussion of areas with downward hydraulic gradients and the effect of surface water impoundments on vertical gradients.	The response is acceptable pending review of the revised report.
7.17) Section 5.5.4 Shallow Water Bearing Zone P. 5-12, paragraph 5. Please explain why the Phase 5 model layers are used to determine which WBZ the mid screen well elevations were located within rather than the depths presented for the WBZ in Sections 5.5.1, 5.5.2 and 5.5.3.	The depths presented in Sections 5.5.1, 5.5.2, and 5.5.3 will be used to determine the WBZ of individual mid-screen well elevations instead of the model layers. Section 5.5.4 of the text will be revised to clarify the source of the depths although the conclusions presented in the text will remain.	The response is acceptable pending review of the revised report.
7.18) Figure 5-15a/b Vertical Gradient Evaluation. Well M-71, M-74, and M-135 were identified on both of these figures as having been	Wells M-71, M-74, and M-135 are screened within the Shallow WBZ (0-55 ft bgs) and were used to generate the groundwater	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
used to calculate vertical gradients, but these wells do not appear on other water level figures in Section 5. Were these wells used in the generation of the water level contours and not presented due to space consideration? Please provide a table in section 5 with the results of the vertical gradient calculations.	table contour map (Figure 5-12a), which does not depict individual wells due to space considerations. However, well symbols will be added to Figure 5-12a in Revision 1 of the RI Report to illustrate the density of data used to create the map. In addition, a table will be added to Section 5 describing the calculation of vertical gradients.	
7.19) Section 5.5.5 Temporal Groundwater Elevation Trends P. 5-13, paragraph 3. Please explain how the "representative wells" were chosen for the groundwater elevation temporal trends. What criterion were used to determine if a well was representative. Perhaps consider presenting the average groundwater elevations for OU-1 over time using all wells that are monitored on the same frequency.	The text in Section 5.5.5 in Revision 1 of the RI Report will be revised to include a justification for the selection of the "representative wells" which will explain that the selection was based on data records, are generally representative of groundwater conditions, and were determined to be representative because the pattern of groundwater elevation changes in these wells is very similar to that of other nearby wells.	The response is acceptable pending review of the revised report.
7.20) Section 5.5.6 Nuclear Magnetic Resonance Investigation P. 5-15, paragraph 3. States that "NMR logs were found to be a useful tool for confirming field observations of lithology and providing an estimate of porosity that is potentially more representative of in situ conditions than laboratory measurements." The NMR logs provide significantly lower effective porosity estimates than that of the laboratory measurements and also significantly lower than that specified in the Phase 6 Model. If NMR logs are more representative, the effective porosity assigned in the Phase 6 Model should be reduced which would significantly increase the predicted groundwater velocity. In the text it is stated that NMR porosity estimates are potentially more representative of in-situ conditions than laboratory measurements. If NMR porosity measurements are more representative, then they should be used. Otherwise, it should be stated that NMR likely underestimates the porosity. Please reconsider and revise text accordingly, else explain why predicted groundwater velocity is accurate.	Additional clarification will be added to Section 5.5.6 in Revision 1 of the RI Report describing how the NMR data has been and will be used. Please see the response to Comment 1.3 for additional information on NMR.	The response is acceptable pending review of the revised report.
	8. Section 6: Scope of the Remedial Investigation	
8.0) Section 6.0 Scope of the Remedial Investigation P. 6-1. A high- level understanding of chronology would be helpful to the reader. Consider adding a table with the year ranges for each Phase of the investigation as	Sections 6.2 through 6.4 of the RI Report include an overview of the OU-1 and OU-2 RI field investigations, including the date ranges for when each phase of the RI investigation was conducted. Appendix A1, Section A1.2.1 includes an overview of the RI drilling program for	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
an Appendix to the report. Also consider including some specifics for each phase as a means of recognizing the back and forth conversations leading to additions to each specific phase.	each phase of the investigation (i.e., Phase 1 RI, Phase 2 RI, and Phase 3 RI), but does not include dates. Revision 1 of the RI Report can include a new table with the year ranges for each phase of the investigation (including the 29 RI Work Plan Modifications) in Appendix A1. Since the Phase 1, 2, and 3 RI Work Plans and the 29 RI Work Plan Modifications clearly articulate the purpose of and background for the various investigative activities and are referenced appropriately with the RI Report, NERT does not believe that adding the purpose of and background for the various investigative activities in the revision to the RI Report is necessary in response to this comment.	
9. Section 7: RI Results: OU-1		
9.1) Section 7.1.1 Initial Soil COPC Screening, P. 7-2, paragraph 2. It is understood that based on the parameters of the risk assessments, which assume exposure up to 10 feet of soil, the NDEP has cleared (requiring no further action) the upper 10 feet of the soil horizon for BRC. Please include this information as the rationale for choosing 10 feet as the cut off for shallow soil within the alluvium as those unfamiliar with the history of the site will not be familiar with this.	The text in Section 7.1.1 in Revision 1 of the RI Report can be revised to include references to both 1) NERT's Baseline Health Risk Assessment (BHRA) Report for OU-1 Soils, which assumes potential exposure to the top 10 feet of soil and was approved by NDEP on June 2, 2022, and 2) BRC's 2007 Closure Plan for the BMI Common Areas, dated May 2007, which resulted in NFAs for the top 10 feet of the soil horizon within each sub-area.	The response is acceptable pending review of the revised report.
9.2) Section 7.1.1 Initial Soil COPC Screening P. 7-2, second bullet paragraph 3. This bullet states that chemicals in soil with a detection frequency of 5% or less were eliminated as COPCs. This is inconsistent with NDEP guidance and past comments on the RI workplans. Detection frequency may only be used following a hot spot analysis. Given the size of the parcels addressed by the RI and the number of samples, a 5% detection frequency may actually result in localized hot spots. Therefore, the lack thereof needs to be demonstrated through the use of intensity plots, spatial analysis, or another technically defensible technique.	This comment is inconsistent with prior NDEP approval of the 2016 Remedial Investigation Data Evaluation Technical Memorandum because the detection frequency of 5% or less was used to eliminate COPCs and narrow the scope of the analytical program for the Phase 2 RI. Revision 1 of the RI Report will include additional screening criteria for chemicals with a detection frequency of 5% or less in the initial screening section (Section 7.1.1). These criteria will consist of an analysis of whether more than 10 samples exceed the screening level and an analysis of whether the maximum concentration is greater than a factor of 20 over the screening level. Spatial plots will be added for chemicals that are not eliminated by these criteria in the secondary screening section.	Spatial plots should be included as part of a hot spot analysis regardless of other criteria investigated for analytes with detection frequencies of less than 5% that are not retained as COPCs. NDEP's data usability guidance requires spatial plotting of the data, and the intent of that is, in part, to look for possible hot spots, given the general sparsity of data compared to the size of the exposure units. This has been a standard requirement for many years. In addition, the NDEP SLERA guidance is perhaps clearer, although this is not a SLERA – the general concept of

NDEP Comment	Response	NDEP Comment on Response
		the need to consider hot spots has always been present in the risk assessment reports in this program. There is no requirement to use 10 samples or a factor of 20 when doing that – in fact it is not clear where these metrics come from. Hot spots should be evaluated for potential human health risk impacts. It seems like some additional statistical analysis is warranted to better prove the 5% or less detection frequency to eliminate COPCs. Perhaps the frequency distribution should be weighted (normalized) over a volume or area to address the points made in this comment.
9.3) Section 7.1.1 Initial Soil COPC Screening, P. 7-2, Last bullet. The Deliverable states that NDEP guidance was followed by addressing the indicator chemicals for total petroleum hydrocarbons. However, this is only part of the guidance, and it does not appear that the second part was followed. Specifically, the BCL guidance further states: "However, there may be sites where petroleum hydrocarbons may be present, but samples were either not analyzed for the indicator chemicals or the indicator chemicals were not detected in petroleum hydrocarbons present. In those cases, BCLs for total petroleum hydrocarbons (TPH) by hydrocarbon type (aliphatic or aromatic) and by molecular weight (low, medium, and high) were developed. The six TPH fractions were assigned representative compounds for determination of toxicity values and chemical specific parameters to calculate BCLs. The PPRTV document for TPH (USEPA, 2009c) was the principal source for these toxicity values. The carbon ranges and representative	The indicator chemicals listed in the NDEP BCL guidance (BTEX, MTBE, and the PAH group) were detected at the site, and sufficient data were collected for the indicator chemicals to evaluate the nature and extent of contamination. The use of the indicator chemicals is therefore appropriate and consistent with NDEP guidance. The text in Section 7.1.1 of Revision 1 of the RI Report will be revised to state this more clearly.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
compounds are listed below. An average of the chemical specific parameters for 2 methylnaphthalene and naphthalene was calculated for the medium aromatic fraction." The Deliverable should be revised to demonstrate that use of indicator chemicals is appropriate and consistent with the BCL guidance.		
9.4) Section 7.1.2.2, Metals P. 7-8, paragraph 5. It would be helpful here to also reference Tables 1-2a and 1-2b, as having the statistical results, with Table 1-3 providing the summary of those interpretations.	Text will be added to Section 7.1.2.2 of Revision 1 of the RI Report to reference Appendix I tables.	The planned response is accepted pending review of the final report.
9.5) Section 7.1.2.3 Radionuclides, P. 7-13. For both Radium 226 and Thorium 230 it is noted that the populations are approximated by a log normal distribution. "The populations are well approximated by a log normal distribution (see Figure I-29 in Appendix I), indicating that while the populations at the site may be higher than background, an anthropogenic source of high activities is unlikely." It's unclear why a log normal approximation would lead to the conclusion that an anthropogenic source is unlikely. Please provide additional discussion or additional analysis to back up the claim that an anthropogenic source for the analytes is unlikely.	Additional discussion will be added to Section 7.1.2.3 of Revision 1 of the RI Report describing the natural variation of metals and radionuclides between and throughout the geologic units across the BMI complex. The referenced conclusion that an anthropogenic source is unlikely is based on this natural variation combined with a lack of obvious contamination and established secular equilibrium. The text will be expanded to provide additional discussion to support the referenced conclusion.	The planned response accepted pending review of the final report.
9.6) Section 7.1.2.3, Radionuclides, P. 7-13. This is a general comment about the presentation of radionuclides. All radionuclides in the Th and U chains are used in the tests of secular equilibrium (both sets of tests demonstrate that the two radionuclide chains are in approximate secular equilibrium). However, nearly all of the rest of the presentation does not show data, data summaries or plots for the uranium isotopes, presumably relying instead on the results for uranium as a metal. Please include the uranium isotopic results in the various tables and plots.	The NDEP BCL guidance states that the groundwater protection BCL for uranium should be based on results for uranium as a metal rather than as radioisotopes. However, Revision 1 of the RI Report will include a discussion of the human health BCL for uranium isotopes. Figures and tables for uranium isotopes in the top ten feet of soil will therefore be added as appropriate.	The planned response accepted pending review of the final report.
9.6.1) Also, why are there no radionuclide data in the southern portion of OU-1?	There are radionuclide data in the southern portion of OU-1. Presumably this comment was made because there are no comparisons to RZ-A background for the radionuclides in Appendix I. This is not because there are no radionuclide data in the southern portion of OU-1, but because there are no	The planned response accepted pending review of the final report.

NDEP Comment	Response	NDEP Comment on Response
	radionuclide data in the NDEP-approved RZ-A background data set. The results throughout OU-1 were therefore compared to the NDEP-approved background data set for the top ten feet of OU-1 soil that does have radionuclide data, which is the BRC/TIMET data set. Therefore, NERT does not believe that a revision to the RI Report is necessary in response to this comment.	
9.6.2) In addition, it is curious that the U chain radionuclides show concentrations that are greater than background (mostly in the upper tails of the distributions) at greater depths. What is the likely explanation for this? There is no source for this U chain considering it is in approximate secular equilibrium; suggesting that leaching from the soil matrix cannot explain this. It seems that a possible explanation is slight geologic differences or analytical differences between the background and site samples. This might not be easy to prove, but finding an explanation associated with a contaminant source seems even more unlikely. More discussion is warranted.	Section 7.1.2.3 of Revision 1 of the RI Report will include text which indicates that the likely explanation for radionuclide concentrations greater than background is geologic variation between and throughout the geologic units across the BMI complex.	The planned response accepted pending review of the final report.
9.6.3) The U chain radionuclide mean site concentrations do increase with depth as well, but presumably they do in the background data as well? It would be helpful to have the summary statistics for background data for comparison.	Summary statistics for the background data sets can be found in the Soil Background Data Set Summary Report, which NDEP requested be a separate deliverable and was approved by NDEP on April 20, 2021. A note will be added to Section 7.1.2.2 of Revision 1 of the RI Report informing the reader of the location of the background data set summary statistics.	The planned response accepted pending review of the final report given the planned discussion relating to 9.6.2. One note in particular for the radionuclide chains is that, as mentioned in the RTC for 9.6.1, there is no background data for RZ-A. However, based on comparing the values that are available in tables 2 and 6 in the Soil Background Data Set Summary Report to values in tables 7-1a, 7-1b, and 7-1c of this report it is not clear that the increase with depth is present in the background data.

NDEP Comment	Response	NDEP Comment on Response
9.7) Section 7.1.2.4, VOCs P. 7-15, paragraph 3. The Deliverable states: "PCE and TCE were only detected at frequencies of 4.1% and 4.6%, respectively (Table 7-1b)." Some of these detections were quite high relative to the leach-based screening level. The mean value of the TCE detects was greater than the leach-based soil screening level. As mentioned in specific comment above, "detections less 5%" is insufficient to exclude analytes as COPCs. Please add additional discussion and/or analysis before TCE and PCE as COPCs.	As stated in the response to comment 9.2, additional criteria will be included for analytes detected in less than 5% of samples. Revision 1 of the RI Report will include additional discussion for PCE and TCE in soil as warranted.	The planned response accepted pending review of the final report.
9.8) Section 7.1.2.11 Other Organics, P. 7-18, paragraph 3. The Deliverable states: "Given the limited area potentially impacted and laboratory uncertainty in the results, formaldehyde is not retained as a COPC for soil in OU-1." Uncertainty in laboratory results is not a logical reason for excluding an analyte for further analysis. Given the samples were all greater than the LSSL, it is prudent to retest samples before elimination, or retain as a COPC.	Section 7.1.2.11 of Revision 1 of the RI Report will be revised to remove analytical laboratory uncertainty as a justification for not retaining formaldehyde as a COPC. Instead, the justification will focus on the limited degree and area of impact of formaldehyde. Seven soil samples analyzed for formaldehyde were collected in 2009 from the area of the laboratory formerly used for quality assurance (QA) testing of the products produced at the ammonium perchlorate plant. The QA laboratory used dilute formaldehyde as part of chemical testing, with the rinse water potentially being discharged to a septic tank. Limited quantities of formaldehyde would have been used in QA laboratory operations and only rinse water containing formaldehyde would have been released to the subsurface. Thus, formaldehyde soil impacts would be limited in magnitude and extent.	It is suggested still that this analyte either undergo retesting or be retained as a COPC. Without either of these responses, it could still be argued that the formaldehyde samples represent a hotspot around the laboratory around which the samples were taken.
9.9) Section 7.2.2.5, SVOCs P.7-30, paragraph 2. "The Deliverable states: "Hexachlorobutadiene was detected in only two groundwater wells screened within the shallow WBZ (0-55 bgs) and was not detected below 55 feet." This appears to be a problematic analyte with respect to the screening level (<0.197 µg/L) and the detection limits which range from 0.25-130 µg/L. This should be addressed in the discussion before excluding hexachlorobutadiene as a COPC for groundwater in OU-1.	Additional discussion of the detection limits for hexachlorobutadiene will be added to Section 7.2.2.5 of Revision 1 of the RI Report. The discussion will include the fact that hexachlorobutadiene is not associated with historical activities in OU-1 and the highest detection limits are likely due to matrix interferences from VOCs and SVOCs in the trespassing OSSM plume.	The planned additional discussion is acceptable. Please make sure to also include the suggested discussion about the screening level and detection limits being close together at the low end of the detection limit range.
9.10) Figures 7-1 through 7-26. It would be helpful to have more consistency in the color coding for the distribution of contaminants. There should be a single color or symbol denoting "above the applicable criterion" whether that is the SSL at DAF 1, DAF 20 or	NERT can revise the applicable figures in Revision 1 of the RI Report consistent with this comment. The color coding for the distribution of contaminants will be reviewed for consistency. However, the intended presentation was to have a consistent color change for the most relevant levels for interpreting the spatial	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
other. Having the max background value incorporated into the coding intervals would be helpful. The figures for some of the metals (e.g., arsenic, cobalt, manganese) are not fully delineated. There are elevated concentrations adjacent to the property boundaries. This should be addressed in the text.	distribution, including the screening levels at DAF 1 and DAF 20, maximum background levels from up to four different background data sets, and other appropriate levels to adequately highlight hot spots. Setting a single color to "above the applicable criterion" may obscure relevant information for certain contaminants. However, text can be added to explain and justify the color-coding intervals for each contaminant. In addition, NERT will revise the text in Revision 1 of the RI Report to include additional discussion of the metals in soil that potentially extend beyond the OU-1 boundary.	
9.11) Figures for Section 7 RI Results: OU-1. Analytes are sometimes plotted spatially at different intervals. This seems to be designed to capture aspects of the depth vs. concentration plots, but it would be nice to have some explanation in the text for why these decisions were made, and why some analytes are only spatially plotted down to 10 ft bgs (i.e., Lead). Some depth plots for groundwater would also be useful, perhaps similar to the ones presented for soil gas.	Additional rationale of the chosen depth intervals for the soil results will be added throughout Section 7 of Revision 1 of the RI Report. It is unclear what is requested in the last sentence of this comment. The groundwater maps are uniformly plotted by depth, similar to the maps for soil gas. Therefore, no changes will be made to Revision 1 of RI Report in connection with this component of the comment.	Neptune's reference should have been to soil, not soil gas. We find that depth plots for GW samples are also useful. We did these for chloroform, and they were revealing for apparent depth cut-offs. It would be helpful to see them here for chloroform and some other analytes.
9.12) Figure 7-70a Chloroform Distribution Shallow WBZ (55-90 ft bgs). AA-MW-14 has no chloroform concentration reported, but it appears as though the contours were drawn assuming that the chloroform concentration was similar to the nearby well AA-MW-13 (<200 ppb) rather than the nearby well B-01 (5,600 ppb). Consider revising the contours without any assumptions regarding AA-MW-14. This would result in the enlargement of the 500 and 1,000 contours, joining the impacted areas to the north and south of AA-MW-14. The contours drawn on Fig 7-70a Chloroform Distribution Shallow WBZ (55-90 ft bgs) already include professional judgment (e.g., M-65, M-66 are ~800 ppb but are inside the 1,000 contour), so additional modifications are consistent with current procedures.	OSSM well AA-MW-14 is no longer sampled by OSSM as part its annual Comprehensive Data Evaluation monitoring program. The most recent available chloroform concentration from sampling by OSSM in well AA-MW-14 was 110 J ug/L (Second Quarter 2013), which is generally similar to the 2013 concentration (400 UJ ug/L) in nearby well AA-MW-13R. The chloroform concentration contours shown on Figure 7-70a in this area are consistent with the interpretation depicted in the Hargis and Associates 2013 and 2014 chloroform isoconcentration maps, prepared on behalf of OSSM and approved by NDEP, which show separation of the impacted areas to the north and south of AA-14. The more recent chloroform maps presented in the OSSM 2015 to 2020 Comprehensive Data Evaluation reports do not show concentration contours, but instead depict the general areas of chloroform with concentrations above 80 ug/L. Regarding wells M-65 and M-66 at the NERT site, the 1,000 ug/L contour is based on the Phase 1 RI one-time groundwater samples collected at locations indicated by the black dots on the figure. This level of detail could not be clearly shown at the scale of Figure 7-70a.	The hot spot near MW-3 is depicted as separate from the hot spot at AA-MW-25 and farther north. Please confirm that this is because there is a separate source, or if this is a function of variability in the groundwater concentrations/monitoring network.

NDEP Comment	Response	NDEP Comment on Response
	However, we will review the concentration data in this part of the site and modify the 1,000 ug/L contour appropriately.	
9.13) Figure 7-70c Chloroform Distribution Middle WBZ (90-130 ft bgs). The former Beta Ditch is believed to be a major pathway for the migration of contaminant onto OU-1. This is apparent in the Shallow Zone figures. However, in the Middle Zone figure, this does not seem to be the case. If this is not the case, please explain in the text that the beta ditch is only relevant as a pathway for the Shallow Zone and that the Middle Zone is controlled by a different transport mechanism.	Section 7.5.1.4 of Revision 1 of the RI Report will be revised to explain that the effect of the former Beta Ditch on migration of contaminants into OU-1 was limited to the Shallow Water- Bearing Zone.	The response is acceptable pending review of the revised report.
10. Section 8: RI Results: OU-2		
10.1) Section 8.1, "Identification of Soil COPCs" on P. 8-1 explains that the NERT Off-Site Study Area, which is located in OU-2 immediately downgradient of OU-1 west of Pabco Road and extends into OU-3, was not evaluated for COPCs in the vadose zone due to lack of overlying contributing operations. While this may be true, there is a potential for soluble constituents such as perchlorate and hexavalent chromium to become trapped in the capillary fringe as groundwater levels decline due to dewatering during pumping, changes in areas and amounts of surface water recharge, or naturally from drought. Trapped COPCs would not be easily flushed from the soil but could continue to contribute mass for an extended period of time.	Section 8.1 of Revision 1 of the RI Report will be revised to include a discussion regarding soluble COPCs in the vadose zone in OU-2 as a source of groundwater contamination.	The response is acceptable pending review of the revised report.
10.2) Section 8.5.2.2 Arsenic P. 8-23, paragraph 7. The statement: "…the vertical extent of arsenic contamination above the established background level is defined within the Shallow WBZ." appears to be contradicted by the data on Figure 8-8b, where the arsenic concentrations in the northern wells range up to 0.12 mg/L, which is above the listed upgradient concentration of 0.059 mg/L. Please revise the text to add additional explanation.	Additional discussion of arsenic concentrations in the northern portion of OU-2 will be added to Section 8.5.2.2 of the text to account for some uncertainty in the vertical extent of contamination in this area. There are limited arsenic data for groundwater within the Middle WBZ within OU-2, but the available data are below the established background level. In addition, there are no arsenic concentrations above background in the Middle WBZ within OU-1. Any contamination originating in OU-1 and migrating into OU-2 would travel horizontally northward and encounter upward vertical gradients, limiting the possibility of contamination below the Shallow WBZ in the northern portion of OU-2.	The response is acceptable but should not use the term "background" but rather "upgradient" Should not use the term background – its upgradient.
10.3) Section 8.5.3, "Summary of Extent of COPCs in OU-2 Groundwater" on P. 8-30 does not list trespassing	Section 8.5.3 of Revision 1 of the RI Report will be updated to include AMPAC Perchlorate as a trespassing COPC.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
perchlorate from AMPAC at the northern end of OU-2 at the western side of the Athens Road Wellfield, although it is discussed earlier in Section 8.5. Perchlorate from the AMPAC should also be listed in Section 8.5.3 based on a comprehensive analysis of multiline of evidence.		
	11. Section 9 Conceptual Site Model	
11.1) Figure 9-2b Conceptual Site Model: NERT Site Study Area to Las Vegas Wash. Should the alluvium be shown as dewatered over more of OU-1 on this figure? (Given the depictions on other figures e.g., 9- 5b Perchlorate in Groundwater in the Shallow WBZ (55-90 ft bgs) Showing the Extent of Saturated Alluvium, 9-7a Tracking of Particles Released at the Base of the Alluvium in OU-1).	Given that Figure 9-2b is a conceptual figure and there are limited areas where the alluvium isn't completely dewatered, NERT does not believe additional changes are warranted based on the information that this conceptual figure is intended to illustrate.	The response is acceptable pending review of the revised report.
11.2) Section 9.1.1, Schematic of the CSM P. 9-3, paragraphs 1 and 2. Paleochannels and interfingering are stated as some of the controlling factors for the movement of COPCs. However, there is insufficient discussion on the extent of the paleochannels and interfingering to support the implied level of significance in the CSM. In addition, the report appears to be using density driven flow, matrix diffusion and upward gradient generally as a way of explaining the presence of COPCs in any location, without necessarily providing location specific evidence that one or more of these mechanisms is in fact driving the concentrations in a location or area.	Additional discussion of how each of these mechanisms contributes to the distribution of COPCs throughout the NERT RI Study Area will be added throughout Section 9 of Revision 1 of the RI Report as applicable. In addition, specific evidence regarding each of the mechanisms will be included.	The response is acceptable pending review of the revised report.
11.3) Section 9.1.1, Schematic of the CSM P. 9-3, paragraph 1. "As indicated in the 2020 Annual Groundwater Monitoring and GWETS Performance Report (Ramboll 2021b), the three extraction well fields completely capture all COPCs migrating from OU-1 via groundwater" is repeatedly stated. Suggest changing language to "the three extraction well fields effectively capture COPCs" as complete capture may be more than can be proven by the data.	Multiple lines of evidence show that the GWETS does completely capture COPCs currently migrating from OU-1, as documented in multiple Annual Groundwater Monitoring and GWETS Performance Reports, including the most recent 2020 Annual Groundwater Monitoring and GWETS Performance Report. Section 9.1.1 of Revision 1 of the RI Report will be updated to include additional justification using the multiple lines of evidence that are presented in the Annual Groundwater Monitoring and GWETS Performance Reports.	The response is acceptable pending review of the revised report.
11.4) Section 9.1.2, Physical Features of the Site P. 9-4, paragraph 1. Please explain how we can tell that the sandy units stated to be acting as preferential flow	We assumed this comment is referring to Section 9.1.2, *Summary of Groundwater Conditions*, on page 9-4. Additional discussion will be added to the text referencing Figure 9-3 in Revision 1 of the RI	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
paths are limited in extent. If they are limited in extent, the text should explicitly state whether they are important for contaminant transport.	Report, which presents a South to North Subsurface Cross-Section from the NERT Site to Las Vegas Wash showing perchlorate concentrations with depth. As can be seen on Figure 9-3, the discontinuous silty sand units within the UMCf are rarely encountered within the UMCf in the northern portion of OU-2 and OU-3 and would therefore not serve as site-related contaminant migration pathways. This is also consistent with the conceptual model for the UMCf presented in Figure 5-5. Therefore, Section 9.1.2 will also be modified to indicate that the sandy units are important for contaminant transport within OU- 1 but become less abundant and limited in extent in OU-2 and have less impact of contaminant migration.	
11.5) Section 9.1.3, Summary of Groundwater Contamination P. 9-5, paragraph 4. Please provide rationale to support that density driven flow may have contributed to downward migration. For example, are there measurements of the density of the brine that was released and could it be shown that higher groundwater levels plus a high density historic release could reverse the observed upward gradient. Please include language to explain how this is occurring.	As described in Section 9.1.3 of the RI Report, the downward migration would have resulted from the combination of infiltration of wastewater and density effects. There are no data on the density of the brine released during prior operations, but the patent for the type of electrolytic cell used for sodium chlorate production at Unit 4 and 5 Buildings specifies the use of a brine with a total dissolved solids (TDS) concentration of 500,000 mg/L. During recent investigations, TDS concentrations up to 48,000 mg/L were measured in groundwater as reported in the Unit Buildings 4 and 5 Source Area Characterization Report. These high TDS concentrations support the theory that brines were released during manufacturing operations. Given that perchlorate is present at significant depths in OU-1, it is clear that the natural upward gradient was reversed during historic manufacturing operations. Since the amount of wastewater infiltration and density of the brines released are unknown, it is not possible to exactly quantify the contribution of density effects to the gradient reversal. However, the evidence is clear that the gradient reversal was at least partially caused by density effects from brines released during prior operations. Section 9.1.2 of Revision 1 to the RI Report will be modified to include language further explaining density driven flows.	The proposed additional explanation of density effects is acceptable. This explanation should be added to Section 5.5.4 as it relates to the discussion of historical downward gradients and the discussion of groundwater flow conditions in Section 5 which forms the basis for the CSM presented in Section 9.
11.6) Section 9.3.2, Migration Pathways P. 9-13, Paragraph 2. The unlined Eastside Sub Area ponds are included along with the unlined Beta Ditch as a major source of contamination yet the unlined Eastside Sub Area ponds do not appear to be discussed in detail elsewhere in the RI Report. Please add more details the usage of the unlined Beta Ditch and its contribution to groundwater recharge and COPCs migrations.	Use of the unlined Eastside Sub-Area ponds and the unlined Beta Ditch is discussed in the RI Report Section 2.3.2, OU-2 East of Pabco Road: History from 1940 to 1975, and Section 2.4.1, Wastewater Management Features Established Prior to 1975. No additional substantive information regarding usage of the Beta Ditch and unlined ponds is available beyond what is presented in Sections 2.3.2 and 2.4.1. As requested, Section	Section 2.3.2 discusses the Upper BMI Ponds. Do the terms “Upper BMI Ponds” and “Eastside Sub-Area Ponds” refer to the same ponds? If so, use the same terminology throughout when referring to the ponds. Section 9.3.2 is the first mention of the

NDEP Comment	Response	NDEP Comment on Response
	9.3.2 of Revision 1 of the RI Report will be updated to include a summary of the periods of use of these features (~1943 to the mid-1970s) as initially presented in Sections 2.3.2 and 2.4.1. A discussion of their contribution to groundwater recharge and COPC migration will also be added, although this discussion can only be conceptual due to the limited information available.	Eastside Sub-Area Ponds in the document, and they require separate discussion in Section 2 if they are separate from the Upper BMI Ponds.
11.7) Section 9.3.2, "Migration Pathways" on P. 9-13 explains that upward hydraulic gradients and matrix diffusion are contributors of COPC mass from the UMCf to the alluvium. Is it possible to estimate the amount of mass that is being contributed from the UMCf due to these processes?	Yes, it is possible. Estimates of mass flux from the UMCf to the alluvium in each OU were most recently presented in Figure 14B of the 2020 Annual Groundwater Monitoring and GWETS Performance Report. Due to the fact that this information is reported elsewhere and is not directly connected to an understanding of the nature and extent of NERT's COPCs, additional details were not provided in the RI but will be evaluated in the forthcoming FS. Section 9.3.2 of Revision 1 of the RI Report will include a reference to where this information can be found.	Revision 1 of the RI Report should also include these data for completeness and because the occurrence will be evaluated in the FS.
11.8) Section 9.3.4, Chemical Mobility and Persistence P. 9-16, Paragraph 4. Is stratigraphic/ lithologic information available to support the statement that "Migration of trespassing DNAPLs onto OU-1 from the OSSM site would have behaved similarly, generally following the slope of the top of finer grained units until reaching residual levels of DNAPL saturation." If stratigraphic/lithologic information is available, an appropriate figure showing the slope of the top of finer grained units should be referenced to support the understanding of DNAPL migration.	As requested, and to further support NERT's conclusions regarding OSSM's trespass, available stratigraphic/lithologic data along the western NERT site/OSSM site boundary will be evaluated to better define the stratigraphic control on the DNAPL migration pathway. This information will be presented on a new figure (e.g., subsurface cross-section along the axis of the DNAPL plume and/or a top of finer grained units elevation map) in Revision 1 of the RI Report.	The response is acceptable pending review of the revised report.
11.9) Section 9.4, Sources of Contamination within OU-1 P. 9-16. The previous sections of the report present the data upon which the CSM is based, and this section should present the interpretation (CSM). These figures should be conceptual in nature based on the information, much like Figures 9-1 through 9-3, using plan and cross- sectional views, as appropriate. Some examples of additional useful information include:	Additional figures will be added to illustrate the interpretations described in the CSM as described below.	The response is acceptable pending review of the revised report.
11.9.1) Figures 9-7a Tracking of Particles Released at the Base of the Alluvium in OU-1 and 9.8 Primary COPC Plumes in the Shallow WBZ (55-90 ft bgs): How much of the plume in OU-1 is believed	A new conceptual figure will be developed and included in Revision 1 of the RI Report based on the new stratigraphic cross- sections showing chloroform concentrations in the western area of the NERT site (see the response to Comment 11.8 above).	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
attributable to the trespassing plumes? The particle tracking could have also been started in each of the source areas of mass significant depths including on OSSM property, to help define the areas of probable trespass to OU-1.	These conceptual figures will illustrate the flow pathways from the OSSM site to the NERT site more clearly than using the suggested particle tracking approach. With respect to the particle tracking approach, as suggested, NERT doesn't have sufficient information to conduct particle tracking from potential sources within the OSSM site, nor is such an activity required to satisfy the objectives of the RI.	
11.9.2) On Figure 9-5b Perchlorate in Groundwater in the Shallow WBZ (0-55 ft bgs) Showing the Extent of Saturated Alluvium: there are two separate "lobes" of impacted groundwater in the Eastside Sub Area. It is assumed that these are both remnants from the infiltration from the former BMI ponds. But it would be helpful to have a figure that explicitly shows the migration pathways in relation to sources. This will need to be more than one figure to present all of the pathways (NAPL, groundwater, preferential migration, soil vapor). The estimated extents of the plumes from each of the sources could be depicted in separate colors, for example, to help the reader visualize the information already presented in the text.	The comment on Figure 9-5b notes the two separate "lobes" of perchlorate in groundwater in the Eastside Sub-Area. A new conceptual figure will be developed and included in Revision 1 of the RI Report for OU-1 and OU-1 showing: 1) the likely historic configuration of the perchlorate impacted groundwater related to infiltration from the BMI Upper Ponds and Beta Ditch when they were operating prior to 1976; and 2) the current perchlorate concentration "lobes" with the locations of the Former COH Southern Rapid Infiltration Basins, or RIBs (operated from 1992-2002) and the Former TIMET Spray Wheel (operated from 1983–1991). The treated wastewater infiltrating to groundwater from the Southern RIBs and the high TDS wastewater treatment effluent released to the ground and possibly infiltrating to groundwater from the TIMET Spray Wheel flowed north through the perchlorate plume, creating an area of lower perchlorate concentrations between two residual "lobes" of higher concentrations.	The response is acceptable pending review of the revised report.
11.9.3) The groundwater contours and contaminant plumes appear to be drawn taking into account the paleochannels, but this is not explicitly shown on the figures.	The paleochannels are shown on Figures 9-5a and 9-5b. Revision 1 of the RI Report will present revised Figures 9-5a and 9-5b with easier to identify paleochannels.	The response is acceptable pending review of the revised report.
11.9.4) A figure showing how far does the DNAPL from OSSM extends onto OU-1, and the interaction with the groundwater. This was shown in a previous section but is important enough to repeat in the CSM section, but as a conceptual figure showing the mechanisms. This is not to say that the CSM is wrong, but that a more explicit presentation of the conclusion of the CSM would help focus the reader on the important points, and tie all of the pieces together.	A new conceptual figure will be developed and included in Revision 1 of the RI Report showing DNAPL and soil vapor migration pathways and the extent of the OSSM DNAPL trespassing onto OU-1. This conceptual figure will be developed based on the new stratigraphic cross-sections showing chloroform concentrations in the western area of the NERT site (see the response to Comment 11.8 above). In addition, the existing OU-1 cross-sections C-C' and D-D' (Appendix C, Plates C-3a/b and C-4a/b) that extend across the DNAPL and trespassing VOCs at the NERT site/OSSM site boundary will be updated to show chloroform concentration contours. Currently Plates C-3a and C-4a show lithology, and Plates C-3b and C-4b show perchlorate concentrations along with posted chromium and chloroform data. Showing the vertical chloroform isoconcentrations	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
	on revised cross-section Plates C-3c and C-4c will help clarify the vertical distribution and extent of the trespassing VOCs and will provide the basis for the conceptual figure. Finally, a separate figure illustrating conceptual migration pathways relative to sources areas in OU-1 will be developed. This will be based on the RI figures showing shallow groundwater isoconcentrations relative to sources (Figure 7-43a, perchlorate; Figure7-45a, chlorate; Figure 7-57a, chromium). As noted above, DNAPL and soil vapor migration pathways will be shown separately.	
11.10) Section 9.4.5, Trespassing Chemicals P. 9-23, Paragraph 2. Trespassing chemicals have been observed between the properties of the BMI complex, but they are widely disputed. NDEP requires that the analysis about the trespassing chemicals be based on multiple lines of data such as hydrogeology, groundwater movement, site history, chemical fingerprint, mass flux and groundwater flow and transport model. The particle tracking analysis (Figures 9-7a Tracking of Particles Released at the Base of the Alluvium in OU-1 and 9-8 Primary COPC Plumes in the Shallow WBZ (55-90 ft bgs), 9-7b Tracking of Particles in OU-2 and OU-3 Released in the Alluvium, and 9 7c Tracking of the Particles in OU-2 and OU-3 Released in the UMCf) show primarily northward flow along the west OU-1 boundary, generally consistent with observed groundwater elevation contours presented in Section 5. However, the particle traces do not address the historic migration of the OSSM chloroform plume in a northeast direction from the OSSM property onto OU-1 (Figure 7- 70a Chloroform Distribution Shallow WBZ (55-90 ft bgs) and 7-70b Chloroform Distribution Shallow WBZ (55-90 ft bgs) OU-1, 2015-2018) nor the migration of the chloroform plume from Unit 4 to the northeast. Additional discussion/analysis should be added to address why observed groundwater flow directions are generally north, but the observed orientation of the chloroform plume indicates that it migrated to the northeast. If changes in pumping have shifted	The observed orientation of the OSSM chloroform and DNAPL plumes to the northeast onto the NERT Site and the northeast orientation of NERT's Primary COPCs plumes (perchlorate, chlorate, chromium, chloroform) within the 90-130 ft depth interval beneath the NERT Unit Building 4 on the NERT site are related to lithologic features within the UMCf in the southern portion of OU-1. The discussion of local geology and hydrogeology in Section 5 of Revision 1 of the RI Report will be expanded to describe these features and include discussion on how such features specifically affect the migration of trespassing chemicals. In addition, new figures will be developed to further demonstrate the OSSM trespassing plume by illustrating the lateral extent of the coarse-grained units within the southern UMCf and the lateral northward facies transition to finer-grained mudflat sediments. Furthermore, the new subsurface cross- sections to be developed in response to comment 11.9.d above and comment 11.13 below will be incorporated into this expanded evaluation.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
groundwater flow directions provide supporting evidence. If chloroform migration is controlled by the slope of low permeability geologic material or any other lithologic feature provide supporting evidence.		
11.11) Section 9.5.1.2, "Former Ditches": Should show more clearly on Figure 2-9 the locations of the ditches.	NERT can revise Figure 2-9 in Revision 1 of the RI Report consistent with this comment.	The response is acceptable pending review of the revised report.
11.12) Section 9.5.1.4. Origin of COPCs in OU-2 P. 9 28, paragraph 4. The difference in the shape of the chloroform plume from the perchlorate, chlorate and chromium plumes is apparent. It is appreciated that this is addressed in the text of previous sections (Section 7) with respect to NAPL but should be mentioned in Section 9 also.	Additional discussion will be included surrounding OSSM's trespassing DNAPL and its effect on the chloroform plume, both at depth and in overlying shallow groundwater. To help illustrate this concept, the outline of the deeper area impacted by DNAPL will be added to the shallow chloroform plume shown in Figure 9-8.	The response is acceptable pending review of the revised report.
11.13) Several wells with elevated chloroform in groundwater within the TIMET property also have elevated perchlorate and chromium, so some chloroform in these wells potentially have same origin as perchlorate and chromium. It will be helpful that the RI report includes quantifications for the mass flux of perchlorate, chromium and chloroform crossing the eastern NERT property boundary of OU-1 along the particle tracking lines starting from the upper gradient sources and the vertical up-gradient mass flux of perchlorate, chromium and chloroform from relatively deeper layers to shallower layers. It was also noticed that the chloroform data of several wells within TIMET property was dated 2008 due to no recent data available, which could carry some uncertainty about the chloroform plumes of this area. Because this RI report concluded that some groundwater chloroform of OU-2 has its source from TIMET property, NDEP suggests collecting chloroform, perchlorate, chlorate, and chromium data from those wells used for more comprehensive analysis on this subject.	Additional information regarding potential sources of chloroform to groundwater within TIMET is available in a 2005 report titled *Potential Source Areas Technical Memorandum* prepared for TIMET by Tetra Tech EMI. Figure 10 in that report shows chloroform concentrations in groundwater above 100 ug/L in shallow groundwater in the area downgradient of the TIMET Unit Building 8. To better clarify the relationship between COPCs in groundwater at the NERT site and the TIMET site, Revision 1 of the RI Report will include new subsurface cross-sections extending from Unit Building 4 at the NERT site into the area of elevated chloroform, perchlorate, and chromium concentrations in groundwater within the TIMET site. Four versions will be prepared showing: i) lithology; ii) chloroform vertical isoconcentration contours; iii) perchlorate vertical isoconcentration contours; and iv) chromium vertical isoconcentration contours. The chloroform, perchlorate, and chromium cross-section figures will include the 2008 TIMET data from the TIMET continuous multi-chamber tubing (CMT) wells (i.e., the CMT-200 series and CMT-300 series). These multiport wells were installed in 2007/2008 and were then sampled once before being decommissioned by TIMET. As a result, more recent data are not available nor is NERT able to collect additional samples from the former monitoring wells. Nevertheless, the existing data is sufficient to determine the nature and extent of contamination in this area. Additionally, with the installation of TIMET's GWETS and after	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
	construction of NERT's Treatment System Extension, chloroform, perchlorate, chlorate, and chromium contamination will be contained to the TIMET property. With respect to the quantification component of the comment, NERT will calculate the mass flux of perchlorate, chlorate, chromium, and chloroform across the NERT/TIMET property boundary for the 90-to-130 ft depth interval and vertical mass flux of each constituent from this deeper interval up into the 0-to-55 ft depth interval on TIMET property. This additional information will be detailed in a new subsection within Section 9 of Revision 1 of the RI Report.	
11.14) Section 9.7.2, Mass Removal P. 9-37, paragraph 1. If sufficient data are available, repeating this mass estimation analysis for chloroform could be useful for understanding the persistence of potential contamination of the groundwater. As the Deliverable notes, the DNAPL plume in the UMCf near the OSSM/NERT boundary represents an ongoing source of VOCs, the most mobile of which is chloroform. Understanding the mass removal compared to the mass in the subsurface would be useful for chloroform, just as it is for perchlorate and chromium.	There are not sufficient data available to estimate the subsurface mass of chloroform nor is this required to meet the objectives of the RI Report. OSSM should be calculating this mass flux and reporting the results as part of their ongoing groundwater monitoring program if required by NDEP. Chloroform is present in the subsurface both as a dissolved plume in groundwater which continues to migrate onto the NERT site and as a component of the DNAPL that was previously released from the OSSM site and also may continue to migrate onto the NERT site. The chloroform mass associated with the DNAPL is expected to be much larger than the dissolved mass. Although the extent of the DNAPL has been generally defined, NERT does not believe the residual saturation and composition of the DNAPL have not been characterized sufficiently by OSSM to estimate the DNAPL chloroform mass. The mass of chloroform in the dissolved plume could be estimated, but this would only represent a small fraction of the total mass. With respect to chloroform removal, the NERT GWETS was not designed specifically to remove chloroform or other VOCs trespassing from the OSSM site. Additionally, the trespassing plume migrates northeastward within the UMCf between OSSM's and NERT's extraction well fields. Therefore, available data indicates that very little of the OSSM trespassing plume onto OU-1 is removed from the environment through either the OSSM or NERT groundwater extraction and treatment system. Although OSSM does physically remove DNAPL from one well on the NERT Site, the quantity is quite small. Additional information on OSSM's DNAPL removal is presented in Montrose's Quarterly DNAPL monitoring reports. Given the well-known longevity of DNAPL sources, the chloroform mass removal rate would be very small compared to the source mass.	Revision 1 of the RI Report should include some additional information so that it is clear this is an issue. Also, this information could help support NERT's position that OSSM should be required to do more about its site characterization and plume containment.

NDEP Comment	Response	NDEP Comment on Response
	The chloroform mass removal rate of the OSSM groundwater treatment system is provided in OSSM's annual reports, but to our knowledge OSSM has not published an estimate of the chloroform mass in the dissolved plume and DNAPL that is located either on the OSSM site or located on the NERT site after trespassing from the OSSM site. It continues to be NERT's position that this is an issue for OSSM to address as part of its groundwater investigation and Remedial Alternatives Study. NERT expects that NDEP will require that OSSM contain its trespassing plume on its property and OSSM should implement an effective DNAPL removal program within OU-1. Furthermore, once OSSM mitigates migration of its trespassing plume, capture of the remaining trespassing plume within OU-1 must be addressed.	
11.15) Section 9.7.3, Mass Remaining in Soil and Groundwater P. 9-38, Table 9-3a. Including a short explanation of the methods used to estimate the masses of perchlorate and hexavalent chromium above Table 9-3a should be included to strengthen the text. It would also be helpful to briefly describe sources of uncertainty in these estimates.	As presented in the RI Report, NERT prepares and updates mass estimates though the Annual Groundwater Monitoring and GWETS Performance Reports. The most recent estimate was presented in the 2021 Annual Groundwater Monitoring and GWETS Performance Report. NERT will revise Section 9.7.3 in Revision 1 of the RI Report to briefly explain the methods used in the mass estimation and provide a description of primary sources of uncertainty. In addition, a reference will be made to the 2017 Performance Metrics Technical Memorandum that NDEP approved which presents the complete methodology.	The response is acceptable pending review of the revised report.
11.16) Section 9.7.3, Mass Remaining in Soil and Groundwater paragraph 4, P. 9-38. In addition to estimating the total mass remaining in the subsurface, a comparison of the estimated mass remaining in the soil and the annual mass extraction by the well fields would be useful for understanding the potential longevity of the contamination entering the saturated alluvium from the UMCf. This would allow the reader to roughly estimate, for example, the percentage of the estimated mass that is extracted per year.	Generally speaking, the Trust would like to note that the current incarnation of the GWETS was designed by Kerr-McGee as a removal action with capture limited to the area roughly west of Pabco Road. NERT's final remedy, on the other hand, will be developed for the entirety of the RI Study Area and developed consistent with the established RAOs, risk assessments, and forthcoming Feasibility Studies. Acknowledging the above, a comparison of the mass removal rate to the total mass remaining in the subsurface can be added to Section 9.7.3 of Revision 1 of the RI Report.	The response is acceptable pending review of the revised report.
	12. Section 10: Summary of Conclusions	
12.1) Section 10.2, Hydrogeology of the NERT RI Study Area P. 10-4. Please quantify the vertical upward gradients to give the reader an idea of magnitude.	Section 10.2 in Revision 1 of the RI Report will be revised to include a summary of measured upward hydraulic gradients.	The response is acceptable pending review of the revised report.
12.2) Section 10.6, "Conclusions," on P. 10-16: Update the list of sources of COPCs trespassing into or migrating to OU-2 for which NERT is not responsible	Section 10.6 in Revision 1 of the RI Report will be revised consistent with this comment.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
after addressing the comments about the trespassing chemicals above.		
	13. Appendix I, Site Soil Background Analysis	
13.1) The R Code for calculations in Appendix I is missing. Please add R code in an appendix. Appendix I, Site Soil Background Analysis. The manner in which Section 7 is structured, where the statistical portion of the COPC selection is tucked away in Appendix I makes it harder to follow the COPC selection logic in the main text. It would be clearer if this was integrated into the text, or at least more effectively summarized. For example, it would help to at least make a comment in Section 7.1.2.2 that the statistical portion is in Appendix I because it is based on work previously done using the same datasets. Additionally, one thing that makes this background comparisons analysis difficult to fully interpret is that summary statistics for the background data are not presented. It would be more helpful if summary statistics were presented for each metals/radionuclide along with the summary statistics for the site data. [at least, if this is presented, we could not find it].	Section 7 and Appendix I in Revision 1 of the RI Report will be revised as follows: The R code provided by Neptune and used to create Appendix I will be included as an attachment to Appendix I. Additional text will be added to Section 7.1.2.2 to more effectively summarize the COPC selection logic of Appendix I. A note will be added in Section 7.1.2.2 informing the reader of the background data set summary statistics in the Soil Background Data Set Summary Report, which NDEP requested be a separate deliverable. The Soil Background Data Set Summary Report was approved by NDEP on April 12, 2021. As this is already noted in the introduction of Appendix I, no revisions to Appendix I are necessary.	The response is acceptable pending review of the revised report, except that it would still be preferable to include the summary statistics for the background data in this report. Otherwise, a reader will have to have both reports open to compare site and background data themselves.
	14. Minor Corrections	
14.1) Section Executive Summary, P. ES-4, paragraph 1. State that "As such, there are multiple sources for several COPCs than just those within OU-1.", Should this read "As such, there are multiple sources for several COPCs other than just the sources within OU-1"?	The Executive Summary in Revision 1 of the RI Report will be revised consistent with this comment.	The response is acceptable pending review of the revised report.
14.2) Executive Summary, P. ES 6, paragraph 2. "With respect to the ditches east and west of OU-1, this use represented a historical source of contaminants to OU-1 environmental media unrelated to former OU-1 operations (i.e., these contaminants were from the neighboring properties) (Geraghty & Miller 1993)." Was it just discharge from OSSM flowing east to west across OU-1 that contributed contamination to OU-1 or was there discharge to the Beta Ditch from TIMET that flowed onto OU-1 as well? If so, showing the flow	The Executive Summary and select figures in Revision 1 of the RI Report will be revised consistent with this comment. The referenced sentence was only meant to refer to discharges from OSSM which migrated across OU-1. The sentence will be updated to read, "with respect to the ditches west of OU-1, this use represented a historical source of contaminants to OU-1 environmental media unrelated to former OU-1 operations […]." No discharges from TIMET are known to have migrated west across OU-1. Small arrows will be added to indicate ditch flow direction on Figures ES-4, 2-2, 2-3, 2-4, 2-5a, 2-6, 2-9, and 2-10.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
direction along the Beta Ditch on Figure ES-4 would be helpful.	Please note that discharges to the Beta Ditch from the OSSM site flowed west to east, rather than east to west as stated in the comment.	
14.3) Figure ES-1 NERT RI Study Area Location Map. Add the location of the former AMPAC site to Figure ES-2. This is pertinent to the discussion regarding the AMPAC Site on P. ES-11.	Figure ES-2 in Revision 1 of the RI Report will be revised to include the former AMPAC site.	The response is acceptable pending review of the revised report.
14.4) Figure ES-4 Historical Sources of Contamination in OU-1. Show the location of the IWF/Barrier wall as it is discussed in the text where Figure ES-4 is referenced. If the IWF/Barrier wall is outside of the Figure ES-4 boundary they could be added to Figure ES-5.	Figure ES-4 in Revision 1 of the RI Report can be revised to include a symbol and a label for the IWF/Barrier Wall.	The response is acceptable pending review of the revised report. if figure is revised
14.5) Figure ES-5 Primary COPC Plumes in the Shallow WBZ (0-55 ft bgs). Add the extractions wells shown on Figure ES-5 to the legend. Label the well fields and show the barrier wall location (i.e., GWET, IWF, etc).	Figure 5-5 in Revision 1 of the RI Report can be revised to add the extraction well symbol to the legend and add labels for the well fields and barrier wall.	The response is acceptable pending review of the revised report. if figure is revised
14.6) Figure 5-6b Sub surface Cross Section A-A' Location Map and Explanation. Figure 5-6b: Two entries in the legend are "MUDDY CREEK FORMATION FINE GRAINED FACIES #1" The second entry should presumably be #2.	The legend in Figure 5-6b in Revision 1 of the RI Report will be revised to list "MUDDY CREEK FORMATION FINE GRAINED FACIES #2."	The response is acceptable pending review of the revised report.
14.7) Section 5.5.1 Shallow Water Bearing Zone P. 5-9, Cross section A- A' (Figure 5-6a) Sub surface Cross Section A-A' Illustrating Site Hydrostratigraphic Units. Please mention in this section that the divisions between the water bearing zones were determined by NDEP.	Section 5.5.1 in Revision 1 of the RI Report will be revised to cite NDEP's water bearing zone definitions as described within NDEP's guidance document on "Hydrogeologic and Lithologic Nomenclature Unification" dated January 6, 2009.	The response is acceptable pending review of the revised report.
14.8) Cross section A-A' (Figure 5-6a) Sub-surface Cross Section A-A' Illustrating Site Hydrostratigraphic Units. This section should also show the water levels measured in the lower wells of the Middle WBZ, in addition to the water levels shown.	The water elevations for the lower wells of the Middle WBZ are shown on Subsurface Cross-Section A-A', on Figure 5-6a, and on Appendix C Plate C-1a. Water elevations are shown as green symbols adjacent to the wells (see the explanation in Figure 5-6b and Plate C-1b). Since the deeper wells are under confined artesian conditions, the water elevation symbols are close to or above the ground surface. Therefore, Revision 1 of the RI Report will not be updated to reflect this comment as the requested data is already present.	The response is acceptable pending review of the revised report.
14.9) Figures 5-12/a/b/c Groundwater Tables Contour Map Second Quarter 2018; Potentiometric Surface Map, Shallow WBZ (55-90 ft bgs), OU-1; Potentiometric Surface Map, Shallow WBZ (~55-90 ft	Figure 5-12b (Potentiometric Surface Map, Shallow WBZ (55-90 ft bgs), OU-1) and Figure 5-12c (Potentiometric Surface Map, Shallow WBZ (~55-90 ft bgs) both illustrate groundwater elevations for wells screened in the saturated UMCf between	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
bgs). For consistency, the unsaturated portions of the alluvium should be consistently presented on these figures.	~55-90 ft bgs. Therefore, saturated/unsaturated conditions in the overlying alluvium do not affect groundwater flow in the lower depth interval of the Shallow WBZ and do not need to be shown on Figure 5-12b and 5-12c. Accordingly, Revision 1 of the RI Report will not be updated to reflect this comment.	
14.10) Section 5.5.1 Shallow Water Bearing Zone P. 5-10. The AWF and SWF are referenced in this section, and should be identified on figures within the section, to help the reader remember where they are. Or this section should refer to a figure in another section where the AWF and SWF are shown.	Figure 5-12a in Revision 1 of the RI Report can be revised to indicate locations of the AWF and SWF. Extraction well locations are already shown on the other figures referenced in Section 5.5.1 (Figure 5-12b and 5-12c).	The response is acceptable pending review of the revised report.
14.11) Section 5.5.1 Shallow Water Bearing Zone P. 5-10, paragraph 3. The calculations for the groundwater velocity values in the alluvium should be presented.	Section 5.5.1 in Revision 1 of the RI Report will be revised to provide a description of how groundwater velocity values were estimated.	The response is acceptable pending review of the revised report.
14.12) Section 6.3 Phase 2 RI P. 6-13. Bullets 6 and 7. If grouting the boreholes per the requirements of NAC 534.420 was done via tremie grouting please add this detail.	Section 6 in Revision 1 of the RI Report will be revised to include a description of the grouting of the boreholes per NAC 534.420.	The response is acceptable pending review of the revised report.
14.13) Section 8.5.1 OU-2 Groundwater Primary COPCs P. 8-22. The discussion of chloroform in this section includes a discussion of the area north of the TIMET GWETS. Please either show the position of the TIMET GWETS on the figures referenced in this discussion or reference another figure showing the TIMET GWETS.	Figure 8-20a in Revision 1 of the RI Report will be revised to include the location of the TIMET GWETS.	The response is acceptable pending review of the revised report.
14.14) Section 9, Conceptual Site Model P. 9-5, Paragraph 3. States that: "The historical migration of perchlorate from OU-1 to Las Vegas Wash, Lake Mead, and the Colorado River that was depicted in the West Side CSM has been eliminated by operation of the GWETS"; however, the West Side CSM does not present/discuss the migration to Lake Mead and the Colorado River.	Section 9 in Revision 1 of the RI Report will be revised consistent with this comment. The referenced sentence will be revised to delete the references to Lake Mead and the Colorado river.	The response is acceptable pending review of the revised report.
14.15) Section 10.7 Next Steps P. 10-16. In addition to the information from the RIs, risk assessments and groundwater transport model, it is assumed that the information from the various pilot and treatability studies performed and in progress at the site will also be used to conduct the Feasibility Studies.	Section 10.7 in Revision 1 of the RI Report will be revised to include pilot and treatability studies as sources of information that will support the feasibility studies.	The response is acceptable pending review of the revised report.

NDEP Comment	Response	NDEP Comment on Response
14.16) References: NDEP 2017c. The department recognizes that revised documents are issued and may overlap with the preparation of deliverables. Please utilize the 2020 version of the BCL Guidance document and its associated screening levels during the revision of the Deliverable.	As of early April 2022, the NDEP website still listed the 2017 BCL guidance document as the current document. As such, the RI Report was prepared using the guidance that was available on NDEP's web site at the time the document was submitted. Revision 1 of the RI Report will cite current department guidance documents and the applicable language and figures will be updated throughout.	