



NEVADA DIVISION OF  
**ENVIRONMENTAL  
PROTECTION**

**STATE OF NEVADA**  
Department of Conservation & Natural Resources  
Brian Sandoval, Governor  
Bradley Crowell, Director  
Greg Lovato, Administrator

April 7, 2017

Jay A. Steinberg  
Nevada Environmental Response Trust  
35 East Wacker Drive, Suite 1550  
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: *Data Validation  
Summary Report (DVSR ID: TetraTech-M041-2016rev1) Groundwater Bioremediation  
Treatability Study, Nevada Environmental Response Trust (NERT), Henderson, Nevada*

Dated: March 1, 2017

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 **6/7/2017** 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](mailto:wdong@ndep.nv.gov) or 702-486-2850 x252.

Sincerely,

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

WD:cp

EC:

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Alison Fong, U.S. Environmental Protection Agency, Region 9  
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Todd Tietjen, SNWA

## Attachment A

### DVSR Review

1. **Section 1.0 and EDD:** 876 results for field blanks and equipment blanks do not have a valid value for the field "validation\_stage". Per NDEP April 2009 guidance, "all data collected at the BMI Complex and Common Areas should be validated at least to Stage 2B." Please validate these samples at Stage 2B or Stage 4 (as necessary to achieve 10% Stage 4 validation) and populate the "validation\_stage" field. Text in this section and Table 2 will require revision to update the number of total results and the number of results validated to each stage.

**Response:** Consistent with NDEP guidance Tetra Tech has not validated the results of field blanks and equipment blanks. NDEP 130605\_all companies-edd\_guidance\_update.pdf states: "Field quality control (QC) data other than replicates are required as part of the EDD but are not uploaded into the regional database. It is understood that field QC data (e.g., trip and equipment blanks, rinsates) may not necessarily have data for fields that are required for native samples, such as location, graphic classification, or sample depth information." Since field blanks and equipment blanks are not native environmental samples, Tetra Tech has not validated these samples.

**Neptune and Company:** We request these sample results be validated for the following reasons:

- This treatment of field and equipment blanks is not consistent with previous submissions for NERT. Field and equipment blanks have been validated for the *Semi-Annual Remedial Performance Reports* and for the combined DVSR for *Performance Report, IX, 2016 Q1 Supplemental, 2016 Q2 Supplemental, Weir Dewatered Groundwater Characterization, and Seep Well Field Sampling*.
  - NDEP Guidance notes: "[all data collected at the BMI Complex and Common Areas should be validated at least to Stage 2A.](#)"
  - These blank samples should be validated to assess their usability before they can be used to access site samples.
2. **Section 1.0 and EDD:** 217 results are noted to have been validated at Stage 2A. Per NDEP April 2009 guidance, "all data collected at the BMI Complex and Common Areas should be validated at least to Stage 2B." Please validate these samples at Stage 2B or Stage 4 (as necessary to achieve 10% Stage 4 validation) and revise the "validation\_stage" field. Text in this section and Table 2 will require revision to update the number of total results and the number of results validated to each stage.

**Response:** Tetra Tech recommended to the Trust that the level of verification and validation be determined by the end-use of the data. Based on those recommendations, treatability study samples shall be validated to Stage 2A. At time of the recommendation, the bulk of the M04 data had already been validated to Stage 2B/4 based on the QAPP. Per the January 11, 2017 email from Weiquan Dong (which was after the date of these comments), NDEP requested that all NERT treatability study data be validated to Level 2A and is currently in the process of revising the existing guidance to reflect this. Therefore, no revisions have been made.

**Neptune and Company:** This comment has been acceptably addressed.
  3. **Section 1.0 and EDD:** The "parameter" field is null for 104 results associated with "analytical\_method". Presumably these are the results for total nitrogen, which is listed in Section 1.0 as associated with the method "NTOTAL". "Calculation" or "CALC" is an

appropriate method for total nitrogen, but please populate the "parameter" field.

**Response:** *The EDD has been updated with the parameter name "Total Nitrogen" and the parameter\_id "TOTN".*

**Neptune and Company:** This comment has been acceptably addressed.

4. EDD, results between the SQL and PQL: Please correct the following issues.

a. 60 analytical results qualified "J" by the laboratory do not have reason code "sp" in the "final\_validation"reason\_code" field. Please add this reason code.

**Response:** *Eight validated sample results with "J" laboratory qualifiers have been updated to include the "sp" reason code; 52 blank samples were not validated or updated (per response to Comment 1).*

**Neptune and Company:** This comment has been acceptably addressed for these 8 results.

b. Tungsten in sample BP-MW09-EM08 was coded with reason code "sp" but the result is a nondetect. Please correct his inconsistency.

**Response:** *b) The reason code "sp" has been removed.*

**Neptune and Company:** This comment has been acceptably addressed.

5. Section 1.0 and EDD: There is one analysis in the EDD by method 9045. Please list this in Table 1 (methods) or change the EDD method to "FIELD" if the analysis was actually performed in the field. If the analysis was performed in the field, the validation stage should be changed from "2A" to null.

**Response:** *Table 1 has been revised to include Method 9045.*

**Neptune and Company:** This comment has been acceptably addressed.

6. Section 2.1: Text indicates RPD is calculated from recoveries; however, the equation indicates RPD is calculated from concentrations. Please standardize to one or the other, or indicate RPD can be calculated either recoveries or concentrations, depending on the parameter being assessed.

**Response:** *The text in Section 2.1 has been updated to "Precision is a measure of the agreement of analytical results under a given set of conditions. It is a quantity that is not measured directly but is calculated from concentrations."*

**Neptune and Company:** This comment has been acceptably addressed.

7. Section 3.0, hierarchy: Per the National Functional Guidelines (NFG), bias is not applied to nondetected results. Please remove the UJ- from the hierarchy.

**Response:** *"UJ-" is not shown in the hierarchy. However, "UJ" has been removed from the hierarchy.*

**Neptune and Company:** The hierarchy previously noted: "UJ = U plus J or J-" and "The UJ qualifier is used when a non-detected (U) flag is added to a biased (J-) or unbiased flag (J)." As it contains more than one qualifier, please add the description of "UJ," without the reference to "J-," back to the hierarchy.

8. EDD, nondetects: All results with a qualification code, including "U," require a reason code. Please add the "nd" reason code defined in Table 12 to the 2,274 results qualified as nondetected (U).

**Response:** *Reason code "nd" was added to appropriate samples.*

**Neptune and Company:** This comment has been acceptably addressed.

9. Sections 3.1.2 and 3.2.2, MS/MSD Samples: The inorganic NFG advises qualifying "all

samples of the same matrix if the samples are considered sufficiently similar," for matrix spike recovery and RPD outliers. Qualifications for recovery and RPD appear to have been applied only to the parent samples. Please, either qualify all samples of the same matrix in the SDG or explain the professional judgment used to determine the additional qualifications were not required.

**Response:** *Qualifiers have been added to inorganic data of associated samples when field and lab data indicated similarity of samples. Section 3.2.2 has been revised to explain this. Additionally, Table 7 (formerly 13) and the EDD have been updated.*

**Neptune and Company:** This comment has been acceptably addressed. (For future submissions, please do not include rejected results in the count of samples qualified; as rejection is seen as a separate action from qualification. For example, in Section 3.2.2, 6 results were rejected and 67 results were qualified.)

10. **Section 3.1.2 MS/MSD Samples:** The inorganic NFG also advises qualifying nondetects for RPD outliers. Lactic acid is an organic analyte but it was analyzed by ion chromatography, a traditionally inorganic method. Please either qualify the nondetected lactic acid result(s) or explain the professional judgment used to determine the qualification was not required.

**Response:** *The inorganic NFG does not have RPD information on matrix spike RPDs, only duplicate analysis RPDs. For duplicate analysis, it advises qualifying RPDs for non-detects in cases where one of the two results of the duplicate pair is detected. Matrix spike RPD information was taken from the organic NFG. Based on this reasoning, no changes have been made.*

**Neptune and Company:** This comment has been acceptably addressed.

11. **Section 3.1.4, FD Samples:** Due to the inherent variability of results near the reporting limit, assessing RPDs for nondetect and low-level concentration results can result in a significant number of qualifications. If an assessment of nondetects and low-concentration results is determined to be necessary, we recommend using a criterion of  $\pm$  the reporting limit for results  $\leq$  the reporting limit, instead of an RPD.

Alternatively, the DVSR for the July through December 2015 Semi-Annual Remedial Performance Sampling took the following approach for assessing field duplicates: "field duplicate samples were evaluated for acceptable precision with RPDs in instances the results were less than five times the reporting limit for the analytes."

Please consider an alternate approach for evaluating nondetect or low-concentration field duplicate results.

**Response:** *The criterion has been updated. Specifically, text in Section 3.1.4 has been updated to include the following statement: "For results > 5X the PQL, the field duplicate samples were evaluated for acceptable precision with RPDs. For results < 5X the PQL, samples were evaluated by the difference between the two measurements." Table 9 (formerly 5) and the EDD have also been updated accordingly.*

**Neptune and Company:** This comment has been acceptably addressed.

12. **Table 6:** Please check and correct the methods listed in this table, as only the first row has the correct method associated with the analyte.

**Response:** *Table 10 (formerly Table 6) has been updated.*

**Neptune and Company:** This comment has been acceptably addressed.

13. **Table 7:** The calibration outliers listed in Table 6 all have high recoveries, but qualifications applied in Table 7 are to nondetects. As nondetects are generally not qualified for high

recoveries, please review these qualifications.

**Response:** According to the NFG, for %D (+/-), non-detected results shall be qualified "UJ". The qualification indicates the approximation/uncertainty of the quantitation limit. Based on this reasoning, no changes were made to qualifiers or EDD. However, the text in Section 3.2.1 was updated to clarify the guidance.

**Neptune and Company:** The outliers listed in Table 10 are for recovery instead of percent difference. Table 4 of the 2014 inorganic NFG states "No Qualification" for nondetects with "ICV/CCV %R 111-125%." Nondetected iron should not be qualified.

Calibration standard recoveries are not addressed in the organic NFG, leaving some room for interpretation for the acids; however, as the acid method is an inorganic method, it would not be unreasonable to apply the above inorganic NFG criterion.

14. **Table 14:** To shorten and clarify this table, we suggest eliminating outliers where the spike was <4x the spike sample concentration, as these do not require qualification of the associated results.

**Response:** Table 12 (formerly Table 14) has been updated to exclude recoveries where the spike was <4x the spike sample concentration and no qualification of the associated results was required.

**Neptune and Company:** This comment has been acceptably addressed.

15. **Table 14 and EDD:**

- a. A number of detects, qualified only for MS/MSD outliers, do not have bias applied. Please add an explanation of this use of professional judgment to the text.

**Response:** Bias has been added where appropriate. For detected results < the PQL, bias was not applied. Based on hierarchy of validation qualification, the "J" qualifier supersedes the bias associated with matrix spike recoveries. Table 7 (formerly 13) and the EDD have been updated accordingly.

**Neptune and Company:** This comment has been acceptably addressed.

- b. The inorganic NFG advises rejecting nondetects with recoveries below 30%. Chlorite in sample BP-MW07-EM08 was not recovered in either the MS or the MSD, but the nondetected sample was estimated instead of rejected. Please, either reject nondetect results associated with recoveries less than 30% or add an explanation of this use of professional judgment to the text. Other instances of nondetect results being estimated instead of rejected were also noted. If results are rejected, completeness in Section 3.5 will need to be revised.

**Response:** Qualifiers were applied and completeness counts were updated per inorganic NFG. Text in sections 3.2.2 and 3.5 have been updated to reflect the rejected data. Table 7 (formerly 13) and the EDD have been updated accordingly.

**Neptune and Company:** This comment has been acceptably addressed.

- c. Formic acid in sample BP-MW07-EM10 has a low MS recovery and a high MSD recovery. The nondetected sample result was not qualified; however, this is similar to having one acceptable recovery and one outlier recovery. In these cases, qualifications were applied. Please, either qualify this sample (and other samples with the same recovery issues) or add an explanation of the professional judgment used.

**Response:** Qualifiers were added to formic acid in sample BP-MW07-EM10 and other samples with the same recovery issues. Table 7 (formerly 13) and the EDD have been updated accordingly.

**Neptune and Company:** This comment has been acceptably addressed.

- d. Table 14 did not list MS/MSD outliers for the following sample/analyte pairs qualified for

MS/MSD outliers in the EDD:

- i. BP-MW07-EM11: COD, nitrite, phosphorus, iron, acetic acid, formic acid, lactic acid, n-butyric acid
- ii. BP-MW08-EM02: nitrite – it appears nitrate should be listed instead
- iii. BP-MW01-EM11: formic acid, lactic acid, n-butyric acid
- iv. BP-MW01-EM07: tungsten

**Response:** Table 12 (formerly Table 14) was updated to include missing outliers.

**Neptune and Company:** This comment has been acceptably addressed.

16. Section 3.2.4 Interference Check Samples: The first sentence, which was to list the methods for which the interference check sample is analyzed, is incomplete. Please, either list the methods or delete the sentence. Also, please list the acceptance criteria or note where the acceptance criteria can be found.

**Response:** The opening sentence in Section 3.2.5 (formerly 3.2.4) has been updated to include methods 314.0, 6010B, and 6020 and acceptance criteria of 80%-120%.

**Neptune and Company:** This comment has been acceptably addressed.

17. Section 3.3.1, preservation and Table 9: The inorganic NFG advises rejecting nondetect results not properly preserved. Please, either reject these nondetect chlorite and COD results or add an explanation of the professional judgment used. If results are rejected, completeness in Section 3.5 will need to be revised. Also, no bias was added to the detected results. Please, either add the bias to the qualifier or add an explanation of the professional judgment used.

**Response:** Qualification, bias, and completeness counts have been updated per inorganic NFG. EDD has also been updated. Sections 3.3.1 and 3.5 have been updated to reflect the rejected data.

**Neptune and Company:** This comment has been acceptably addressed.

18. Section 3.3.2 Blanks: Please explain the professional judgment used to not add bias to results less than the PQL.

**Response:** Based on hierarchy of validation qualification, the "J" qualifier supersedes the positive bias associated with blank contamination. The text in section 3.3.2 has been updated to explain this.

**Neptune and Company:** This comment has been acceptably addressed.

19. Tables 15 and 16 and EDD: Neither of these tables list blank detects for the following sample/analyte pairs qualified in the EDD:

- a. Iron: BP-MW01-EM10, BP-MW02-EM10, BP-MW05-EM10, BP-MW08-EM10, BP-MW09-EM10, BP-MW09-EMBL

**Response:** Table 16 has been updated to include the samples and analytes qualified.

**Neptune and Company:** This comment has been acceptably addressed.

- b. Phosphorus: BP-MW01-EM09

**Response:** Table 15 has been updated to include the samples and analytes qualified.

**Neptune and Company:** This comment has been acceptably addressed.

20. Table 17 and EDD: The following results were qualified for detects in the equipment blank (coded with reason code "be"), but were identified in Table 17 as associated with field blank detects. Do these reason codes need to be changed to "bf"? If so, the qualified sample counts in Section 3.3.2.2 will need to be corrected.

- a. Acetic acid in BP-MW08-EM08  
**Response:** *The reason code has been changed to "bf" in EDD. The qualified sample count in Section 3.3.2.2 has been corrected.*  
**Neptune and Company:** *This comment has been acceptably addressed.*
- b. Chromium in BP-MW01-EM09, BP-MW05-EM09, BP-MW09-EM09, MW-K5-EM09  
**Response:** *The reason code has been changed to "bf" in EDD. The qualified sample count in Section 3.3.2.2 has been corrected.*  
**Neptune and Company:** *This comment has been acceptably addressed.*
21. Table 17 and EDD: Total iron in BP-MW08-EM08 was qualified for a blank detect; however, it had no associated detect listed in Table 17. Please correct this inconsistency.  
**Response:** *Qualifier for total iron was applied in error. It has been removed from BP-MW08-EM08. EDD has also been updated.*  
**Neptune and Company:** *This comment has been acceptably addressed. (Please note the "Reason Code Definition" for this result still reports "EB.")*
22. Section 3.2.6, Analyte Quantitation and Target Identification: Text in this section indicates there were no issues with analyte quantitation; however, results for tungsten in samples BP-MW03-EM08, BP-MW04-EM08, BP-MW06-EM08 and BP-MW07-EM09 were estimated for quantitation (reason code "q"). Please correct this inconsistency.  
**Response:** *Text in Section 3.2.8 (formerly 3.2.6) has been updated to discuss qualification of tungsten results.*  
**Neptune and Company:** *This comment has been acceptably addressed.*
23. Other EDD issues: The following qualifications identified in the EDD and Table 13 were not discussed in the text. Please include a discussion of all qualifications in the body of the report.
- a. Results for tungsten in samples BP-MW03-EM08, BP-MW04-EM08, BP-MW06-EM08, BP-MW07-EM08, and BP-MW09-EM08 were estimated for "other" (reason code "o").  
**Response:** *Tungsten reason codes have been updated to "q" only. Text in Section 3.2.6 has been updated to discuss qualification of tungsten results. EDD has been updated.*  
**Neptune and Company:** *This comment has been acceptably addressed.*
- b. Arsenic in sample BP-MW05-EM09 was estimated for serial dilution (reason code "sd").  
**Response:** *A section on Serial Dilutions (Section 3.2.4) has been added to discuss qualification of arsenic.*  
**Neptune and Company:** *This comment has been acceptably addressed.*
- c. Thallium in samples BP-MW03-EM06 and BP-MW08-EM06 were qualified for internal standard outliers (reason code "i").  
**Response:** *A section on Internal Standards (Section 3.2.7) has been added to discuss qualification of thallium.*  
**Neptune and Company:** *This comment has been acceptably addressed.*

## EDD Review

- As noted in DVSR comment 1, the field blanks and equipment blanks should be validated. When these samples are validated, please update the validation\_flag field as well as the validation\_stage field for these records.



**Response:** Consistent with NDEP guidance Tetra Tech has not validated the results of field blanks and equipment blanks. 130605\_all companies-edd\_guidance\_update.pdf states: "Field quality control (QC) data other than replicates are required as part of the EDD but are not uploaded into the regional database. It is understood that field QC data (e.g., trip and equipment blanks, rinsates) may not necessarily have data for fields that are required for native samples, such as location, graphic classification, or sample depth information." Since field blanks and equipment blanks are not native environmental samples, Tetra Tech has not validated these samples.

**Neptune and Company:** See response for DVSR comment #1.

2. As noted in DVSR comment 3, there are 104 records in the results table where the parameter and parameter\_id are null. Please identify the appropriate parameter and parameter\_id for these records.

**Response:** The EDD has been updated with the parameter name "Total Nitrogen" and the parameter\_id "TOTN".

**Neptune and Company:** This comment has been acceptably addressed.

3. There were 8 results in the results table where the matrix is SO (soil) and the result\_units are mg/L. These results are associated with methods appended with "soluble". As this creates a matrix/units mismatch in the database, please change the analytical method to include "soluble," as this would provide sufficient information to verify the units are correct.

**Response:** The EDD has been updated as requested.

**Neptune and Company:** This comment has been acceptably addressed.

4. There are 174 records in the results table where the parameter "Perchlorate" has the analytical\_suite="Other Inorganic". This option is not listed in Appendix E of the EDD guidance. The appropriate analytical\_suite would be "GENERAL", which includes perchlorate in the list of wet chemistry type measurements.

**Response:** The EDD has been updated as requested.

**Neptune and Company:** This comment has been acceptably addressed.

5. Note that the field "asbestos\_sensitivity\_units" was misspelled. Please correct for future EDD files.

**Response:** This correction has been applied to the subject EDD and the template.

**Neptune and Company:** The "b" is still missing in the field "asbestos\_sensitivity\_units". Please correct your template for future submissions.