



STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

June 18, 2008

Susan Crowley
Tronox LLC
PO Box 55
Henderson, Nevada 89009

Re: **Tronox LLC (TRX)**
NDEP Facility ID #H-000539
Nevada Division of Environmental Protection (NDEP) Response to:
Phase B Source Area Investigation Work Plan Area IV (Western and Southern LOUs).
Tronox LLC Facility, Henderson, Nevada
Dated May 16, 2008

Dear Ms. Crowley,

The NDEP has received and reviewed TRX's Phase B, Area IV Sampling Analysis Plan (SAP) identified above and finds the document acceptable with the conditions and comments provided in Attachment A.

Errata sheets should be submitted based on the comments found in Appendix A. TRX should additionally provide an annotated response-to-comments (RTC) letter as part of the errata submittal. Alternately, in place of an RTC letter, TRX can discuss these comments with the NDEP in a meeting or via phone. Please advise the NDEP regarding the schedule for this submittal. Please note that it is NDEP's intent that TRX should be able to proceed with implementation of this SAP upon submittal of the erratum and RTC letter (or completion of meeting with NDEP in lieu of the RTC letter).

Please contact the undersigned with any questions at sharbour@ndep.nv.gov or (702) 486-2850 extension 240.

Sincerely,

Shannon Harbour, P.E.
Staff Engineer III
Bureau of Corrective Actions
Special Projects Branch
NDEP-Las Vegas Office

SH:bar:sh



CC: Jim Najima, NDEP, BCA, Carson City
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Paul Black, Neptune and Company, Inc., 8550 West 14th Street, Suite 100, Lakewood, CO 80215

Attachment A

1. General comment, as stated in NDEP's comments to the Phase B Area I SAP, TRX should revise Table 2 to note that all samples within the 0 – 1 fbg interval will be collected from 0 – 0.5 fbg unless the area is paved. If the area is paved it is expected that the sample will be collected from a representative depth beneath the pavement. Alternately, if an unpaved area is within a reasonable distance the sample could simply be moved to the unpaved area. Table 2 should be revised accordingly. These changes should be reflected in the Table 2 errata pages for the Phase B Area IV SAP and any future Sampling Analysis Plans (SAPs) submitted to the NDEP.
2. General comment, for borings located above LOU 60, TRX should log the condition of the pipe, if possible, and collect a sample directly underneath the pipe. This sample may be substituted for the next proposed 10 foot interval in the Phase B SAPs, Table 2. (e.g. if the bottom of the Former Acid Drain System pipe was located at 8 fbg, then the sample should be collected directly underneath the pipe and not at 10 fbg). Please note that this comment additionally applies to the Phase B Area I SAP. Please add text and footnotes to future Phase B SAPs that contain sampling for LOU 60 to reflect this change.
3. Section 1.0, page 1-2, 2nd paragraph, "Acid Drawn System" should be "Acid Drain System". Please revise text accordingly.
4. Section 1.1, page 1-3, 3rd paragraph, final sentence, the term "statistical sample population" is not correct and should be revised to "a statistical sample of the population" or "a statistical sample". However, because these collections of samples include both random and judgmental samples, the term "statistical sample" is also not necessarily strictly accurate. Using the term "sample of the population" or just "sample" is probably best under the circumstances of these data.
5. Section 1.1, page 1-4, 3rd bullet, NDEP is unclear how "pathways not applicable in the HHRA" relates to "the evaluation of flux chamber measurements". Please clarify this statement.
6. Section 1.1, page 1-4, 1st paragraph, NDEP could not located description of human health risk assessment (HHRA) work plan in Section 3.0 as stated in this paragraph. TRX should acknowledge this statement for the Phase B Area IV SAP and provide the description in any future Phase B SAPs submitted to the NDEP. In addition, it is noted that the HHRA work plan should be developed as soon as possible.
7. Section 2.1, page 2-1, 3rd bullet, TRX should add the groundwater direction to this statement.
8. Section 2.2.1, page 2-3, 2nd paragraph, TRX states that "if current operations do not exacerbate contamination, future closure for the would not require sampling for the full SRC list (i.e. if a chemical is not detected in the Phase B Investigation and is not a part of the process associated with the LOU, it would not be analyzed for at the time of closure)." The NDEP does not necessarily concur with this statement at this time and will review this issue at the time of closure.
9. Section 2.2.1, page 2-4, 4th paragraph, TRX should include discussion on groundwater as a source of continuing soil contamination.
10. Section 2.3, page 2-5, 1st paragraph, TRX should note that groundwater samples will be collected from 18 wells under the Phase B Area IV SAP not 1 as is stated in the text.
11. Section 2.3, general comment, TRX should additionally discuss surface sampling for dioxin. Please see above general comment about sampling depths.

12. Section 2.3.1, page 2-5, 3rd paragraph the term "statistical sample population" is not correct as discussed above, please correct this issue throughout the document.
13. Section 2.3.2, page 2-6, the NDEP has the following comments:
 - a. General comment, TRX does not discuss cyanide analysis. Please add cyanide analysis to this section. Additionally, TRX should note that there is only toxicity data available for free cyanide. If only total cyanide analysis is conducted, then TRX will need to assume that the total cyanide concentration is equal to the free cyanide concentration in the HHRA.
 - b. 1st bullet, please note that PCB analyses should include Aroclor and congener analyses.
 - c. 5th bullet, it is the NDEP's understanding that TRX will not use gamma spectroscopy for any of the Phase B radionuclides analyses.
14. Section 2.3.3.1, page 2-7, the information presented herein does not need a separate section (Section 2.3.3) and should be incorporated into the preceding section.
15. Section 2.3.4.1, page 2-7, the third bullet (concerning TRX using the reagent water leaching method in addition to "extraction fluid #2") on the original page 2-7 has appears to have been removed. It may have been moved to page 2-8 but no errata page for 2-8 was submitted. TRX should acknowledge this omission for the Phase B Area IV SAP and include the omitted text in any SAPs submitted in the future.
16. Section 2.3.4.1, page 2-8, 1st paragraph, TRX states that "The leachate data derived from the reagent water and that from the pH 5.0 water will be compared to reflect variable wetting conditions at the site." This text should be revised to state that the leachate data will "...reflect variable pH conditions..."
17. Section 2.3.4.2, general comment, NDEP advises TRX to consider how the SPLP data will be used for risk assessment. Additionally, it is expected that TRX will determine whether any modeling will be conducted. Based on these considerations, TRX should evaluate the geotechnical / physical and chemical properties that are being collected to determine if the number of parameters and samples will provide sufficient data.
18. Section 2.3.4.2, page 2-8, TRX should collect the fraction of organic carbon (f_{oc}) in addition to the listed parameters. TRX should acknowledge this omission for the Phase B Area IV SAP and include should this parameter in any future Phase B SAP submitted to the NDEP.
19. Tables, the NDEP has the following comments:
 - a. General comment, the NDEP requests that TRX prepare and present a table and corresponding figure that includes well construction details (e.g. casing diameter, age, materials of construction, screened interval, etc.) versus geology. This table may be submitted as an addendum/insert for the Phase B Areas II and III reports and is not necessary for the implementation of the Area IV SAP. This table should include all wells proposed for sampling in the Phase B Area SAPs.
 - b. Table 1, TRX should include a footnote referencing the approval date of the SRC list used for this table.
 - c. Table 2, the NDEP has the following comments (Please note that the following comments for Table 2 should be addressed by the submittal of errata pages for the Phase B Area IV SAP and incorporated in future Phase B SAPs submittals.):
 - i. General comment, the rationale for judgmental samples included in Table 2 of the Phase B Area IV and future Phase B SAPs should be more focused on how the boring will represent the LOU(s) indicated.

- ii. General comment, in the HHRA and/or future SAPs, TRX should identify whether judgmental borings should be indicative of worst case scenario conditions for a given LOU by using historic information/data, historic aerial photography, etc.
 - iii. General comment, Geotechnical Tests column, the boring-depth sample numbers should be removed from Table 2, page 5 of 5. TRX should alternately indicate the depth of geotechnical sample collection at these borings in the main part of the table. Rational for the geotechnical samples can be included in the Location Description and Characterized Area Rationale column. Please note that the mark indicating a geotechnical sample should be footnoted if the sample is proposed as optional.
 - iv. General comment, Rationale column, TRX should provide additional explanation on the choice of location for each boring in respect to each LOU (i.e. whether the boring represents worst case scenario for a LOU and how this was determined, etc.).
 - v. The following borings should include the corresponding analyses:
 - 1. SVOCs: SA191
 - 2. Cyanide: all borings located in Area 4 west of column 6 (not inclusive) and all borings associated with LOU 60 downstream of the LOU 63 conveyance piping junction. Please additionally revise and resubmit Phase B Area I SAP, Table 2, as necessary.
 - 3. Radionuclides: SA115-20, SA115-30, and SA115-40
 - d. Table 3, the NDEP has the following comments (Please note that the following comments for Table 3 should be addressed by the submittal of errata pages for the Phase B Area IV SAP and incorporated in future Phase B SAPs submittals.):
 - i. General comment, TRX should note that the NDEP does not necessarily agree that the selected wells are representative of the up-gradient, down-gradient and/or cross-gradient conditions as stated in the Appendix A LOU packets. The NDEP does note that the overall coverage of the groundwater sampling plan appears adequate.
 - ii. General comment, TRX should note the water bearing zone of each of the proposed wells in this table.
 - iii. General comment, please clarify whether the wells designated as “upgradient” are to be included in the Alluvial Aquifer Background SAP. If TRX is intending that these wells be a part of the Alluvial Aquifer Background SAP, then TRX should remove these wells from the Phase B Area IV SAP.
 - e. Table 6, TRX should note that this table was not reviewed in detail by the NDEP as it is NDEP’s assumption that this table is consistent with the approved QAPP.
 - f. Table 7, TRX should note that this table was not reviewed in detail by the NDEP as it is NDEP’s assumption that this table is consistent with the approved QAPP.
20. Figure 4, the NDEP has the following comments (Please note that the following comments for Figure 4 should be addressed by the submittal of errata pages for the Phase B Area IV SAP and incorporated in future Phase B SAPs submittals.):
- a. TRX should clarify which water bearing zone is being represented and review the well construction details to determine that all wells used for this figure are in the targeted water bearing zone.
 - b. TRX should use groundwater elevation data from additional wells across the site to more accurately and precisely determine the groundwater direction and gradient. If additional wells are used for this figure, then TRX should include them on the map.
 - c. TRX should illustrate the groundwater direction on this figure.

21. Plate A (Please note that the following comments for Plate A should be addressed by the submittal of errata pages for the Phase B Area IV SAP and incorporated in future Phase B SAPs submittals.):
 - a. Add the location of LOU 66.
 - b. Update this plate to include the following comments to the Appendix A LOU packets that affect boring placement.
 - c. Indicate visually which borings will additionally include geotechnical sample collection.
22. Appendix A, the NDEP has the following comments:
 - a. General comment: TRX should indicate in future LOU packages as to whether any proposed or historic borings/samples represent the worst case scenario conditions for the given LOU and how the location(s) for the worst case scenario conditions was/were determined.
 - b. General comment, TRX should include discussion on the background radionuclide data in the LOU packages, as appropriate.
 - c. General comment, TRX should reference the appropriate ASTDR value for dioxin/furans.
 - d. General comment, the NDEP has noted many examples of non-consistent units within the LOU package data tables. TRX should review and revise all data table for the LOU packages for consistent units within each table for future Phase B SAPs submittals.
 - e. General comment, the NDEP has noted several examples of TRX referencing EPA Region VI MSSLS and Region IX PRGs in the LOU data packages. TRX should review and revise all LOU data tables to contain only EPA Region VI MSSLS until otherwise directed by the NDEP.
 - f. General comment, the NDEP has noted that TRX has not included the DAF 1 and DAF 20 values in the LOU data packages as necessary. TRX should review and revise as necessary for future submittals.
 - g. LOU 4 (Hardesty Chemical Company Site), LOU 26 (Trash Storage Area), LOU 27 (PCB Storage Area), and LOU 28 (Hazardous Waste Storage Area), the NDEP has the following comments:
 - i. LOU 26, TRX should check using old aerial photography, etc. that the location for SA120 represents the worst case scenario for this LOU. Additional rationale as to the confidence that the location of SA120 represents the worst case scenario sampling should be included in the errata for Table 2.
 - ii. LOU 27, wipe and chip samples should be additionally collected in LOU 27 and analyzed for PCBs. TRX should provide a SOP and Work Plan for the collection of the wipe and chip samples. The SOP and Work Plan may be included as errata to the Phase B Area VI SAP or submitted under separate cover. These additions should be indicated in the errata for Plate A and Table 2.
 - iii. Table A: See above comments for Table 2 as applicable
 - iv. Figure 1, the NDEP has the following comments (The following changes should be included in the revised Plate A.):
 1. SA84 should be relocated over the LOU 60 (Acid Drain System).
 2. SA138 should be relocated to the approximate location of the termination of the above ground pipeline.
 3. SA191 may be moved into LOU 28; otherwise, TRX should place an additional boring in LOU 28 either between the two ASTs or just north of the northernmost AST in the northwest corner of LOU 28.

- h. LOU 41, LOU 65a, LOU 65b, LOU 65c, and LOU 65d, SA169 should be relocated to the east directly above the Lou 60 (Acid Drain System).
- i. LOU 59 (Storm Drain System Segment), the NDEP has the following comments:
 - i. General comment, the borings associated with this LOU should be located immediately adjacent to the storm drain system whenever possible.
 - ii. SA116 should be relocated southwest to the western southernmost segment of LOU 59.
 - iii. SA118 should be relocated southeast to the approximate location of historic sample location M116 on the eastern southernmost segment of LOU 59.
 - iv. An additional boring should be located adjacent to TRX's eastern property boundary on the eastern southernmost segment of LOU 59.
 - v. An additional boring should be located adjacent to LOU 59 where it re-enters TRX property across the western property boundary (near SG44).
- j. LOU 60 (Former Acid Drain System), the NDEP has the following comments:
 - i. General comment, the borings associated with this LOU should be located directly above the former acid drain system whenever possible.
 - ii. General comment, TRX should identify the construction material of this LOU.
 - iii. An additional boring should be located over LOU 60 where the acid drain system re-enters TRX property across the western property boundary (near SG88).
 - iv. Three additional borings should be located one at each junction on the northernmost segment of LOU 60 in Area IV (north of Unit Buildings 1 and 2).
- k. LOU 62 (State Industries, Inc. Site), the NDEP has the following comments:
 - i. Description, 5th bullet, 2nd sub-bullet, TRX should identify the location of Building T-5. Please submit an errata sheet for this revision.
 - ii. Figure A, please submit a revised figure that indicates the location of the following:
 - 1. Buildings T-4, T-5, and T-8,
 - 2. Conveyance piping to/from the former ponds
 - 3. Conveyance piping to the Former Acid Drain System
 - 4. Sanitary sewer that received the LOU 62 discharge overflow from the Former Acid Drain System
 - iii. Please note that additional sampling may be necessary based on the submittal of the above information.
- l. LOU 66 (Flintkote Company Lease, Former Aboveground Diesel Tank), please provide additional discussion on the rationale that TRX does not have to sample this LOU. NDEP does not concur at this time.