



environmental management, inc.

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Date: September 1, 2010

To: Shannon Harbour, NDEP

RE: Response to NDEP's July 20, 2010 Comments on *Excavation Plan for Phase B Soil Remediation of RZ-C, Addendum to the Removal Action Work Plan* dated: July 1, 2010.

Northgate Environmental Management, Inc. (Northgate) submits this Response to Comments on the *Excavation Plan for Phase B Soil Remediation of RZ-C (EP)* on behalf of Tronox LLC (Tronox). Tronox has reviewed the July 20, 2010 Nevada Division of Environmental Protection (NDEP) comments and responds accordingly.

1. *Comment: General comment, TRX references "dioxins" throughout the document; this should be changed to dioxins/furans. This is a global comment and will not be repeated for specific instances.*

Response: "Dioxin" has been changed to dioxins/furans throughout the RZ-C excavation plan as directed.

2. *Comment: Section 1.0, page 1, 1st paragraph, NDEP has the following comments:*
 - a. *TRX should remove the statement that this Deliverable only addresses the top 10 feet of soil at the Site.*
 - b. *2nd paragraph, TRX references "modified risk-based goals agreed upon by NDEP." Please clarify what is being referenced here (e.g. dioxins/furans, lead, etc.).*
 - c. *2nd paragraph, TRX should clarify and explicitly state that this document does not address all soil-to-groundwater leaching issues and include soil-to-groundwater leaching in the definitions of "contaminated soil".*

Response:

- a. The statement that the excavation plan only addresses the top 10 feet of soil has been removed from Paragraph 1 and a modified statement is now in Paragraph 2. It has been modified to make the reference to 10 feet only for discussion of protection of human health. Tronox will excavate below 10 feet as directed in NDEP comments.
- b. Paragraph 2 has been modified to state that the modified Site-specific risk-based concentration (RBRC) are for dioxins/furans (in terms of a 2, 3, 7, 8-TCDD TEQ).
- c. Paragraph 3 has been added to address the proposed actions to address the soil-to-groundwater leaching issues.

3. *Comment: Section 1.1, page 2, TRX should also note the presence of the historic cooling*

tower and related hexavalent chromium contamination in RZ-C. This issue should also be considered with regards to the Perimeter Air Monitoring Plan and Health and Safety Plan as hexavalent chromium has very low thresholds for worker safety.

Response: Section 1.1.2 has been revised to include a discussion of the historic cooling tower and the use of hexavalent chromium. Tronox is currently revising the proposed air monitoring for this area to include hexavalent chromium. The Contractors Health and Safety Plan is also being modified to include hexavalent chromium.

4. *Comment: Section 2.1.3, last paragraph, TRX should state add “pending NDEP approval of Environmental Covenants” to the end of the last sentence.*

Response: Section 2.1.3 has been modified as directed.

5. *Comment: Section 2.1.4, page 5, NDEP believes that very deliberate remediation could occur at the Equalization (BT) Tanks area without interrupting the groundwater treatment system. NDEP requests that TRX contact NDEP for further discussion on this matter as soon as possible.*

Response: A discussion has been added to Section 2.1.4 to describe the surface and foundation conditions in the BT Tank area. Tronox proposes to delay remediation in the BT Tank area until the tanks are no longer needed and that this proposal should be discussed with NDEP.

6. *Comment: Section 2.1.5, page 6, TRX indicates that some excavation may be inhibited by the existence of active utilities and that TRX will discuss any impacts to excavation limits as “situations arise”. TRX should be able to make a preliminary determination as to which excavation polygons will be impacted by the location of utility lines and discuss the impacts to the effected polygons with NDEP now instead of after excavation has commenced. Please modify Figures 1 and 3 as necessary to address this comment and contact NDEP to discuss any changes to excavation limits.*

Response: Section 2.1.5 has been revised to address this comment. Tronox is currently evaluating the issues associated with excavations proposed in the excavation plans and the utilities throughout the Site. When this evaluation is complete, Tronox will meet with NDEP to discuss the issues identified. Based on the resolution of these issues, Figures 1 and 3 will be modified and presented in an errata to the excavation plans.

7. *Comment: Section 3.1, page 7, TRX should note that any imported fill material should have supporting analytical sampling data to support a Health Risk Assessment (HRA).*

Response: Section 3.4 has been modified in response to this comment.

8. *Comment: Section 3.2, page 7, it is suggested that TRX discuss specific wells with NDEP in parallel with implementation of the scope of work as some of these wells may no longer be needed and plugging and abandonment may be a more cost-effective option than protection in place or replacement.*

Response: Tronox has prepared a memorandum that will be sent to NDEP shortly containing a listing of all wells that are present in proposed excavation areas and the



proposed disposition of these wells.

9. *Comment: Section 3.3, page 8, NDEP provides the following comments:*
- a. *TRX needs to address the issue of areas that are not proposed for backfill versus the pending HRA. If TRX chooses to not backfill some areas, this will result in a new 0-10 fbg soil horizon for these areas. It is not clear that sufficient data exists to complete the HRA in these areas. TRX should consider backfilling all of the excavations. Please develop and submit a sampling and analysis plan to address any data gaps for the HRA **by August 3, 2010**. Please note that this comment also applies to Table 1.*
 - b. *2nd paragraph, please clarify how excavations will be sloped when an excavation is adjacent another excavation or clean soils. That is, will the lateral boundaries be expanded to accommodate the 1:1 side slopes so that the bottom of the excavation encompasses the entire excavation polygon? Please clarify.*

Response:

- a. Section 1.3 Data Evaluation explains Tronox's procedures to address the issues raised by this comment.
 - b. Section 3.3 has been revised to explain how adjacent excavation will be performed. In addition, Figure 4 has been included for illustration purposes.
10. *Comment: Section 4.0, page 10, NDEP has the following comments:*
- a. *NDEP does not necessarily agree that the areas listed should have engineering and/or institutional controls.*
 - b. *NDEP has previously commented in a July 2, 2010 response letter to the RZ-D Excavation Plan that "NDEP disagrees with TRX's decision logic for restricting excavation to unpaved areas only." TRX should contact NDEP as soon as possible to discuss this issue.*
 - c. *For confirmation purposes and to assist in development of any controls determined to be appropriate, NDEP requests that TRX collect and analyze soil samples immediately adjacent to areas with soil contamination that are not excavated due to surface obstructions.*
 - d. *Last paragraph, TRX is referencing an "NDEP-approved Revised Environmental Covenants, Institutional and Engineering Control Plan submitted by Tronox on June 9, 2010 for NDEP review and comment." NDEP has the following comments:*
 - i. *Please revise for clarity by providing the Deliverable date instead of the submittal date.*
 - ii. *NDEP has not responded to the referenced Deliverable; therefore, it cannot be "NDEP-approved". Please revise accordingly.*

Response:

- a. Tronox intends to discuss the proposed engineering/institutional control areas with NDEP and reach agreement.
- b. No planned excavation areas have been constrained by pavement areas.
- c. Three additional pre-confirmation borings have been added around the BT Tanks in response to this comment (See Figure 2b).
- d.
 - i. The deliverable date has been added;



ii. The reference to “NDEP-approved” has been removed.

11. *Comment: Table 1, NDEP provides the following comments:*

- a. *Please review and revise this Table as necessary based on the comments contained in this letter.*
- b. *RZ-C-09, TRX states that the eastern end of this excavation area conforms to Old Pond P-3 boundary; however, based on review of Figure 2b, the excavation area does not conform with the Old Pond P-3 boundary. Please revise as necessary.*
- c. *RZ-C-24, arsenic and benzo(a)pyrene should be added to the Chemicals Group Driving Excavation Depth column for this excavation area.*
- d. *RZ-C-33, according to Appendix A, hydrochlorobenzene was not analyzed for this boring; however, arsenic was elevated and should be listed as a driver for excavation. Please revise the Chemicals Group Driving Excavation Depth column for this excavation area as needed.*

Response:

- a. Table 1 has been revised appropriately based on the NDEP comments.
- b. Table 1 now reflects that RZ-C-9A is constrained to the southeast by the Old Pond P-3 boundary.
- c. RZ-C-24 now reflects this comment.
- d. RZ-C-33 now reflects this comment.

12. *Comment: Figure 2a, NDEP provides the following comments:*

- a. *Sample location SA57, it appears that a 5 fbg excavation depth should be applied to this location. Please revise the figure accordingly or explain why this sample is proposed to be left in place.*
- b. *RZ-C-04 and RZ-C-06, TRX should additionally post and use Parcel F data for the development of these polygons.*
- c. *RZ-C-05, NDEP provides the following comments:*
 - i. *Sample location SA207, please increase the related excavation depth to 11.5 fbg in this area as this nominal 1.5' increase in excavation depth will resolve the magnesium contamination in this location.*
 - ii. *Sample location SSAO3-02, please clarify why a 10 fbg excavation is planned for this location.*

Response:

- a. The depth has been changed to 5 feet, as suggested.
- b. A review of the Parcel F data indicates that the stated polygons are separated from the sampling areas by a strip of land identified as “Timet NFA Area”. In addition, all of the polygons shown adjacent to the NFA strip had only asbestos contamination; therefore, excavation areas RZ-C-04 and 06 should not extend into Parcel F.
- c.
 - iii. The depth on RZ-C-5B has been increased to 12 feet based on the analytical results for sample location SA207;
 - iv. Because RZ-5 was split into two areas, the depth of RZ-C-5A which contains SSAO3-02 has been modified to 5 feet.

13. *Comment: Figure 2b, NDEP provides the following comments:*

- a. *Sample location SSAO6-03, it appears that at least a 0.33 fbg excavation depth*



should be applied to this location. Please revise the figure accordingly or explain why this sample is proposed to be left in place.

- b. *RZ-C-09, NDEP provides the following comments:*
 - i. *Sampling location SA-11, this sampling location is within LOU8 (P-3 Pond and Associated Conveyance Facilities) and was not analyzed for dioxin. The adjacent sampling location within LOU8, SA108, exhibited dioxins/furans concentrations ranging from 4,500 – 10,723 ppt TEQ. As such, NDEP believes that SA-11 should either be sampled for dioxins/furans or excavated to 3 fbgs based on dioxins/furans concentration data from SA108. Please revise as necessary.*
 - ii. *Sampling location DDAO4-03, the dioxins/furans concentration at this location is 200 ppt TEQ at the 3.0-4.0 fbgs interval. TRX should either collect a 0.0-0.5 fbgs sample or excavate to 3 fbgs in this area. Please revise the Figure as necessary.*
- c. *RZ-C-10, NDEP suggests that TRX increase the excavation depth in this location to remove as much of the perchlorate source material as practical. NDEP suggests that TRX consider the incremental cost of removing this material versus long-term soil flushing, monitoring and remediation in this soil location.*
- d. *RZ-C-12, please increase the excavation depth to 11 fbgs in this location as this nominal 1' increase in excavation depth will resolve the hexachlorobenzene contamination in this location.*
- e. *RZ-C-12 and RZ-C-13, TRX should include the sampling data and locations for RZ-B that influenced the limits of these excavation polygons.*
- f. *RZ-C-17, TRX should clarify why the excavation depth for this polygon is 0.5 fbgs instead of 0.33 fbgs.*
- g. *RZ-C-23 and RZ-C-27, please clarify how the Conceptual Site Model (CSM) for LOU34W is being used to constrain these excavation polygons.*
- h. *RZ-C-24, based on the arsenic data provided, the depth of this excavation area should be 2 fbgs.*
- i. *RZ-C-25, NDEP provides the following comments:*
 - i. *Please review and revise, as necessary, the northern cutline for this excavation area so that the cutline is equidistant from each sampling point.*
 - ii. *Based on the arsenic data provided, the depth of this excavation area should be 4 fbgs.*

Response:

- a. *Tronox does not have asbestos data for SSAO6-03 at this time, but concurs that the excavation depth will be at least 0.5 feet. The data are pending and an errata sheet for the polygon will be issued once the depth is confirmed.*
- b. *i. The excavation depth has been revised to 3 feet as requested;*
ii. The depth has been revised to 3 feet as suggested. Figure 2A has been revised.
- c. *Tronox has considered this comment and has elected to limit the maximum depth of excavation to 10 feet where the driving chemical is perchlorate. For other chemicals, the depths of excavation have been deepened as requested by NDEP. Tronox intends to remediate deeper perchlorate through a combination of remediation techniques, including flushing and bioremediation.*
- d. *The proposed depth of excavation has been deepened to 11 fbgs to remove HCB, as requested.*
- e. *Figure 2A has been revised to show the bordering boring locations in RZ-B to RZ-C-12 and RZ-C-13.*



- f. The depth of RZ-C-17 has been changed to 0.33 fbgs.
 - g. LOU 34W does not constrain these polygons. The polygons shapes have been revised accordingly.
 - h. The depth of RZ-C-24 has been revised to 2 fbgs.
 - i.
 - v. The southwestern outline has been moved slightly to reflect this requested change.
 - vi. The depth of RZ-C-25 has been revised to 5 fbgs.
14. *Comment: Figure 2c, NDEP provides the following comments;*
- a. *Sampling location SA105, the dioxins/furans concentration at this location is 1402 ppt TEQ for the 0.5 – 2 fbgs interval. Based on the approved dioxins/furans sampling protocol, a 0.0 – 0.5 fbgs sample should have been collected at this sampling location. Please have this location sampled and revise the figure accordingly.*
 - b. *Sample location SSAN6-05, it appears that at least a 0.17 fbgs excavation depth should be applied to this location. Per TRX's approved sampling rationale for asbestos, additional sampling at 0.33 fbgs should be collected to determine the final depth of excavation. Please revise the figure accordingly or explain why this sample is proposed to be left in place.*
 - c. *RZ-C-28, NDEP provides the following comments:*
 - i. *Sample location SSAM5-02, it appears that a 5 fbgs excavation polygon could be drawn for this location. Please revise the Figure as appropriate.*
 - ii. *Sample locations SA15 and RSAM5, NDEP suggests that TRX increase the excavation depth in this location to remove as much of the perchlorate source material as practical. NDEP suggests that TRX consider the incremental cost of removing this material versus long-term soil flushing, monitoring and remediation in this soil location.*
 - iii. *Sample location SA65, TRX should consider tying the final depth of the excavation for this sampling location with the depth determined for locations SA15 and RSAM5 as the contamination in location SA65 exceeds 21.5 fbgs.*
 - d. *RZ-C-30, sample location SSAM6-02, based on TRX's pre-confirmation sampling rationale, TRX should collect additional samples to determine the final depth for this excavation polygon. Please modify the Figure as appropriate.*
 - e. *RZ-C-31, NDEP provides the following comments:*
 - i. *Sample location SA198, please clarify the depth of excavation associated with this sample location as it appears that the 10 fbgs excavation is excessive. In addition, it appears that there may be conceptual site model (CSM) constraints associated with this location.*
 - ii. *Sample location SSAM6-01, NDEP suggests that TRX increase the excavation depth in this location to remove as much of the perchlorate source material as practical. NDEP suggests that TRX consider the incremental cost of removing this material versus long-term soil flushing, monitoring and remediation in this soil location.*
 - f. *RZ-C-32, it appears that this excavation can be reduced to 2 fbgs; please clarify.*
 - g. *RZ-C-36, based on the dioxins/furans data at SSAN6-01 and other adjacent sampling locations, TRX should either collect additional samples for dioxins/furans or excavate to 3 fbgs.*
 - h. *RZ-C-39, TRX should either collect additional samples per the approved sampling protocol for dioxins/furans or excavate to 0.5 fbgs.*



- i. *While NDEP does not necessarily agree that BT Tank area should be excluded from excavation, this area should be labeled and demarked.*

Response:

- a. The requested sampling has been completed and the results are posted on Figure 2c. Concentrations of dioxins/furans in the top six inches require removal.
 - b. The data were posted incorrectly for this sampling location. The correct data indicates that the samples from this location do not exceed the Comparison Criteria.
 - c.
 - i. The figure has been revised to reflect the 5 foot excavation depth.
 - ii. See response to Comment 13.
 - iii. See response to Comment 13c.
 - d. The data set incorporated into this response indicates that this RZ-C-30 should be excavated to a depth of 10 feet. Figure 2b has been revised.
 - vii. RZ-C-31 has been split into two excavation areas RZ-C-31 and 31A. The excavation depth of 31A is 0.5 feet.
 - viii. See response to Comment 13c.
 - e. RZ-C-32 has been revised to reflect a depth of 2 feet as suggested.
 - f. RZ-C-36 has been revised to reflect a depth of 3 feet as suggested.
 - g. RZ-C-39 has been revised to reflect a depth of 0.5 feet as suggested.
 - h. The BT Tank area has been labeled and demarked, as requested.
15. *Comment: Figure 2d, according to Table 1, RZ-C 46 and RZ-C-47 will not be excavated to below BCLs. Please provide justification for not excavating these areas or documentation that the manganese tailings removal activities excavated to the required depths.*

Response: Based on the posted data on Figure 2c, Tronox concludes that these areas will be excavated to depths that remove soils exceeding the Comparison Criteria.

16. *Comment: Appendix A, please review and revise this table as necessary as not all data included on the Figures were included in this Table. For example, SA139 and SSAN8-01 are not listed.*

Response: The missing sampling locations have been added to the Appendix A table, as requested.

