



environmental management, inc.

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Date: November 5, 2010

To: Shannon Harbour, NDEP

RE: Response to NDEP's October 25, 2010 comments on *Revised Excavation Plan for Phase B Soil Remediation of RZ-C, Addendum to the Removal Action Work Plan, Tronox LLC, Henderson, Nevada*

Northgate Environmental Management, Inc. (Northgate) submits this Response to Comments on the *Revised Excavation Plan for Phase B Soil Remediation of RZ-C* (EP) on behalf of Tronox LLC (Tronox). Tronox has reviewed the October 25, 2010 Nevada Division of Environmental Protection (NDEP) comments and responds accordingly. Tronox is providing this response to comments and is not providing revised figures or tables until the time when all the remaining sampling data has been received and incorporated into these documents, per NDEP's Comment 1 below.

1. *General comment, TRX should contact NDEP by **November 1, 2010** to schedule a conference call to discuss these comments or to advise NDEP that TRX plans to implement work in accordance with these comments. Additionally, NDEP does not plan to review any errata or written response-to-comments provided by TRX until such time as all of the RZ-C sampling data has been received or otherwise determined by NDEP.*

Response:

Tronox concurred with the revisions provided by NDEP for RZ-C Figures 2a through 2c and therefore did not schedule a conference call in accordance with this comment.

2. *General comment, to avoid confusion due to multiple issuances of comments, NDEP lists each excavation area with the contaminated sample location(s) that is/are driving excavation for a particular remediation polygon along with the sampling locations that determine the limits of the remediation polygon. The following protocol should be used unless conceptual site model (CSM) rationale is used to modify.*
 - a. *The basis for deriving the excavation polygon lateral and vertical extents is summarized below; however, these comments may not be comprehensive and TRX should note that the lack of an NDEP comment on specific instances where this methodology was not followed does not relieve TRX's obligation under the Order to complete the excavation in accordance with these criteria:*
 - i. *The depth of the excavation polygon was determined by the depth to a non-contaminated (i.e. less than BCLs or background) sample in the contaminated sampling location.*
 - ii. *The lateral limits of excavation for the Voronoi diagrams/Thiessen polygons were generated by determining the half-way point between defining contaminated sampling location(s) and adjacent non-contaminated sampling*

locations or adjacent contaminated sampling locations with a different depth of excavation determination.

- iii. Upon NDEP approval, conceptual site model (CSM) rationale may be used to constrain the limits of excavation; however, TRX must present the justification and receive approval for the constraint prior to implementation.*

Response:

Tronox concurs with the procedures described in comment 2 and subsections *i.* through *iii.*

3. *General comment: TRX should provide discussion on the disposition of former pond berms in final grading.*

Response:

When executing the excavation plan, a portion of the interior of the embankment will be removed in those excavations greater than 3 feet in depth. Where the embankment is between excavation areas, the embankment will be excavated to the depths shown on the excavation plan. The final grading plan does not contain mass site shaping or flattening. The plan indicates the limits of the excavation areas, those areas that will be backfilled to grade, and those that will not be backfilled. The final grading plan also shows the grading work necessary to construct the proposed retention basins and the transport channels.

4. *Section 3.2, page 10, NDEP views this section as informational only as TRX has submitted a separate Deliverable with recommendations for the wells affected by the excavation polygons for each remediation zone. NDEP has issued a response concerning well abandonment in response to this well Deliverable.*

Response:

Tronox agrees that Section 3.2 page 10 is informational only and the separate deliverable is the controlling document.

5. *Section 3.4, page 12, TRX continues to defer the issue of how risk assessments will be conducted in areas where backfill is not proposed to be placed. Therefore, NDEP provides the following:*
 - a. If excavation that will not be backfilled is less than or equal to 5 feet below ground surface (fbgs), TRX may use the current 10 fbgs data to represent the new 0 – 10 fbgs range.*
 - b. Excavations greater than 5 fbgs either need to be backfilled to pre-excavation grades or a post-excavation 10 fbgs sample must be collected and used in the risk assessment.*

Response:

Tronox concurs with the statements presented in Comment 5 and subsections *a* and *b.*



6. *Table 1: NDEP provides the following comments:*
- a. *TRX should revise this Table based on the comments found in Attachment B.*
 - b. *In comparison with Figure 1, Site property boundary samples do not appear to have been collected at the property boundary between ChemStar and TRX in excavation polygon RZ-C-13. Please collect a boundary confirmation sample at property boundary with ChemStar in RZ-C-13.*
 - c. *Please notify NDEP as soon as the pending results for the following sampling points are received so that a final depth of excavation can be established for the corresponding remediation polygons:*
 - i. *SSAN6-08 (RZ-C-16A)*
 - ii. *SSAM5-02 (RZ-C-28A)*
 - d. *The following borings should have the analytes listed added to/removed from the “Chemicals Group Driving Excavation” column:*
 - i. *RZ-C-06: add hexachlorobenzene (HCB), dioxins/furans TEQ*
 - ii. *RZ-C-34: remove perchlorate*
 - iii. *RZ-C-46A: remove manganese and cobalt*
 - e. *RZ-C-05: boring SSAN2-01 cannot be used to reduce the limits of excavation for this polygon because asbestos is the chemical driving excavation and asbestos was not analyzed in this samples.*
 - f. *RZ-C-07A: borings RSA04 and SA47 cannot be used to reduce the limits of excavation for this polygon because dioxins/furans TEQ is a chemical driving excavation and dioxins/furans TEQ was not analyzed in these samples.*
 - g. *RZ-C-10 and RZ-C-10A: TRX should indicate how the berms for LOU8 will be handled during excavation and final grading.*
 - h. *RZ-C-10B: polygon should be added to table as shown in Attachment B with arsenic listed as the chemical driving excavation.*
 - i. *RZ-C-13A: polygon should be added to table as shown in Attachment B with HCB as the chemical driving excavation.*
 - j. *RZ-C-16A: polygon should be added to table as shown in Attachment B with dioxins/furans TEQ and HCB as the chemicals driving excavation.*
 - k. *RZ-C-18: TRX should indicate how the berms for LOU7 will be handled during excavation and final grading.*
 - l. *RZ-C-22B: polygon should be added to table as shown in Attachment B with arsenic (and potentially asbestos) as the chemical driving excavation.*
 - m. *RZ-C-28: this excavation polygon should be divided into three separate polygons as shown in Attachment B. Additionally, the chemical drivers for the subdivided polygons are as follows:*
 - i. *RZ-C-28 – perchlorate*
 - ii. *RZ-C-28C – asbestos, perchlorate*
 - iii. *RZ-C-28D - perchlorate*
 - n. *RZ-C-34: perchlorate is not a chemical driving excavation and should be removed from Table 1.*
 - o. *RZ-C-39A: polygon should be added to table as shown in Attachment B with asbestos as the chemical driving excavation.*
 - p. *RZ-C-40A: this excavation polygon should be divided into two separate polygons as shown in Attachment B. Additionally, the chemical drivers for the subdivided polygons are as follows:*
 - i. *RZ-C-40A: dioxins/furans TEQ, HCB*
 - ii. *RZ-C-40B: dioxins/furans*



- q. RZ-C-41A: this excavation polygon should be removed from Table 1 as shown in Attachment B since it was not shown on any of the RZ-C Figures. RZ-C-16A replaces this polygon on Table 1.
- r. RZ-C-43: this excavation polygon should be removed from Table 1 as shown in Attachment B since the asbestos results reported for SA151 are in error. The correct results are 2 chrysotile fibers not 1 amphibole fiber, and therefore, are not in exceedance of the comparison levels for asbestos. No excavation is necessary.
- s. RZ-C-45: this area is the former manganese tailings pile. Based on confirmation soil sampling after the removal of the tailings pile, additional contamination has been discovered. RZ-C-45 will be divided into several other polygons based on the results of additional sampling and will be submitted under separate cover.
- t. RZ-C-46: this excavation polygon should be divided into two separate polygons as shown in Attachment B. Additionally, the chemical drivers for the subdivided polygons are as follows:
 - i. RZ-C-46: arsenic, cobalt, manganese
 - ii. RZ-C-40A: arsenic

Response:

- a. Tronox has reviewed Attachment B and finds the following differences:
 - RZ-C-02C was not created; rather, for ease of construction the additional area at the northwest corner was added to RZ-C-02A with a depth of excavation of 3 feet;
 - The shape of Area RZ-C-10B was revised based on NDEP's comments and is no longer in contact with LOU 8 (no longer an exception);
 - RZ-C-13 will be excavated to 2 feet;
 - RZ-C-22 is 6 feet rather than 4 based on recent arsenic data;
 - RZ-A-22A exception is along the eastern edge against the Manganese tailings pile;
 - RZ-B-22B: depth of excavation is 8 feet rather than 10, based on new arsenic data;
 - RZ-C-24: depth of excavation is 2 feet rather than 1.5 because the first clean sample for arsenic is at 2 feet;
 - RZ-C-26 was reduced in size and no longer borders Chemstar;
 - RZ-C-35: depth of excavation is 6 feet based on an exceedances of arsenic at 5 to 6 feet; and
 - RZ-C-40A is impacted with dioxin to a depth of 0.5 feet.
- b. Because of the short time frame for remediation, Tronox proposes to collect this confirmation sample at the time of remediation.
- c. These samples are still pending.
- d. These chemicals will be removed as directed.
- e. RZ-C-02A was revised based on this comment.
- f. RZ-C-07A was revised based on this comment.
- g. The embankment associated with RZ-C-10A will be scrapped for asbestos as RZ-



C-09A. Within the pond for RZ-C-10 and 10A, the excavations will be at the toe of the internal slope and will be vertical.

- h. This data will be added.
 - i. This data will be added.
 - j. This data will be added.
 - k. The berm in LOU 7 will be excavated to the depths shown for RZ-C-17,-18 and -19.
 - l. RZ-C-22B has been added to the table and arsenic is the driving chemical.
 - m. RZ-C-28 has been divided into three polygons and, based on RZ-E sample BT2-20, a fourth polygon was added that mainly overlies RZ-C-28A. The depth of the new polygon is 4 feet. Table 1 will be revised to reflect the chemical drivers shown in subsections *i.* through *iii.*
 - n. Perchlorate will be removed from Table 1 for RZ-C-34.
 - o. RZ-C-39A has been added to Table 1 with asbestos as the driver.
 - p. Polygon RZ-C-40 has been divided as indicated.
 - q. Polygon RZ-C-41A has been removed from Table 1.
 - r. Polygon RZ-C-43 has been removed from the figures and from Table 1.
 - s. RZ-C-45 will be subdivided when the new analytical data becomes available.
 - t. Polygon RZ-C-46 has been divided as indicated. The drivers have been changed to reflect this comment.
7. *Figures: the limits for the remediation polygons have been revised per these comments found in Attachment A, the Attachment B table, and the Attachment C Figures.*

Response:

The polygon boundaries have been revised as indicated.

