



environmental management, inc.

From: Deni Chambers
Renee Kalmes
Maile Smith

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To: Shannon Harbour }
Greg Lovato } Nevada Division of Environmental Protection (NDEP)

RE: Indoor Air Quality Investigation and Proposed Indoor Air Sampling Locations (technical memorandum dated June 3, 2010) and Response to NDEP Comments on Proposed Indoor Air Sampling Locations, Tronox Facility Henderson Nevada, Supplement to Indoor Air Quality Investigation Work Plan, dated April 22, 2010.

As requested during the conference call on June 15, 2010, Tronox provides the following clarifying comments regarding *Indoor Air Quality Investigation and Proposed Indoor Air Sampling Locations* (technical memorandum dated June 3, 2010) at the Tronox LLC, Henderson, Nevada site (Site).

As outlined in the *Human Health Risk Assessment Work Plan* (HRA), the Johnson & Ettinger (J & E) model will be used with the collected soil gas data to estimate potential exposure point concentrations to evaluate the indoor air vapor intrusion exposure pathway. As indicated in the *Indoor Air Quality Investigation Work Plan* (IAQ) dated April 22, 2010, the air sampling data to be collected in current on-site buildings will be used as part of the uncertainty evaluation in the HRA to provide context with regard to the J & E modeled indoor air concentrations. This initial round of sampling is not intended to provide information to quantitatively extrapolate between modeled versus measured indoor air concentrations or to address all issues associated with the variability of indoor air sample results. As indicated in the IAQ, additional indoor air samples will be collected twice, at a minimum to address potential seasonal differences. Tronox recognizes that measured (as opposed to modeled) indoor air concentrations would be the preferred source of exposure point concentration used in the HRA, as it reduces the level of uncertainty associated with the modeled approach. Therefore, after the initial round of indoor air sampling, Tronox will continue discussions with NDEP regarding the potential applicability of future indoor air sampling results in the HRA.

Based on this clarification, as well as the attached response to NDEP comments, Tronox proposes to proceed with the collection of indoor air samples as outlined in the June 3, 2010 technical memorandum. For purposes of the administrative record, Tronox proposes to address NDEP's comments to the June 3, 2010 technical memorandum as part of the Site-Wide Soil Gas Evaluation Report as indicated in the attached response to NDEP comments, rather than providing a revised technical memorandum.

**Response to NDEP Comments on Proposed Indoor Air Sampling Locations,
Tronox Facility Henderson Nevada, Supplement to Indoor Air Quality Investigation
Work Plan, April 22, 2010**

1. *Page 1, second paragraph, the NDEP assumes that, during the building evaluation (and therefore determination of sample locations), TRX documented and considered information regarding current activities that may involve use and or release of VOCs, as well as building dimensions, building layout (including known and potential conduits), and potential outdoor sources of VOCs. No response is required for this comment, however, this issue should be explicitly addressed in the final report.*

Response: Acknowledged. No response required.

2. *Page 1, fourth paragraph, due to variability in indoor air sample results, one sample per building does not provide adequate data for evaluation of representativeness of exposure point concentrations for a particular building. A minimum of two samples should be taken per building. We also note that seasonal variability in indoor air VOC concentrations is typical and TRX should consider periodic re-sampling to address these variations. If there are sub-areas within the building that are unique in regard to indoor air conditions and/or key receptor locations, additional samples should be collected to represent those sub-areas.*

Response: As shown in Table 1 of the June 3, 2010 technical memorandum, several samples are proposed in the Laboratory and Unit 3 buildings. One sample per building is proposed in those buildings in which a small control room or office is the only occupied area.

3. *Page 2, first full paragraph, it is recommended that at least two downwind outdoor samples be taken each day that indoor sampling occurs.*

Response: Outdoor downwind samples are proposed that will result in at least two outdoor samples being collected on each of day of sampling.



4. *Page 2, second complete paragraph, TRX states “Several buildings were excluded from the air sampling program because building structural characteristics, occupancy, and/or low concentrations of chloroform in the subsurface result in a lack of receptors or an incomplete exposure pathway...” This statement addresses current exposures, but not potential future exposures. In addition, areas identified solely based on soil gas concentrations of chloroform do not account for cumulative exposures to multiple VOCs. It may be worth considering collecting indoor air data for current buildings that may be present in the future even if current exposures do not exist for those buildings. Please consider and discuss these issues in the revised Deliverable.*

Response: As indicated in the June 3, 2010 technical memorandum, Unit 4 and Unit 5 were excluded from the air sampling programs as Unit 4 is an open building structure and Unit 5 is operational. Additionally, Unit 5 operations currently use acidic materials that may impact the summa canister, and it would not be practical to obtain indoor air samples in these buildings. We do not believe that indoor air sampling is warranted in the training facility or Veolia building during this phase of sampling as other locations such as the field office and administrative building will provide adequate information to evaluate these types of buildings. If appropriate, additional sampling of these buildings can be conducted during the next round of indoor air sampling.

5. *Page 2, second paragraph, the NDEP assumes that soil vapor data and modeling will suffice for current buildings that are not included in the indoor air program, as well as for all potential future building scenarios. No response is required for this comment, however, this should be explicitly discussed in the final report.*

Response: Acknowledged. No response required.

6. *Page 2, third paragraph, the NDEP assumes that the TO-15 analysis is limited to chloroform, TCE, and carbon tetrachloride because the results of the soil vapor data and modeling indicate that a Tier 1 (model-based) analysis is adequate for current and future indoor air pathway exposure assessment for the other TO-15 analytes. Because there is no mention of select ion mode (SIM) analysis, we assume that only the full scan TO-15 method will be employed. Please clarify.*



Response: As indicated in the IAQ (page 4) and the June 3, 2010 technical memorandum (page 2), samples will be analyzed for chloroform, trichloroethene (TCE) and carbon tetrachloride using the TO-15 gas chromatograph/mass spectrometry (GC/MS) selected ion monitoring (SIM) method.

7. *Figure 1 shows chloroform isopleths. The legend indicates health-based Johnson & Ettinger (J&E) screening limits (501 $\mu\text{g}/\text{m}^3$ and 2,040 $\mu\text{g}/\text{m}^3$, lower and upper limit, respectively). We were unable to locate the basis behind these values (the back-up documentation and modeling output) in the Deliverable. Please reference the source of these values or provide the back-up documentation.*

Response: The back-up documentation to the screening limits is provided in the following series of technical memoranda:

Site Specific Input Parameters for the Johnson & Ettinger Model. From Deni Chambers and Greg Brorby to Brian Rakvica. February 10, 2010.

Supplemental Documentation Supporting Site-Specific Input Parameters for the Johnson and Ettinger Model. From Deni Chambers, Scott McLaughlin and Greg Brorby to Brian Rakvica. February 10, 2010.

Comparison of Analytical Methods for Fine Particles Size Distribution. From Deni Chambers, Scott McLaughlin and Greg Brorby to Brian Rakvica. March 1, 2010.

Complete documentation and calculation of all screening values will be provided as part of the Site-Wide Soil Gas Evaluation.

8. *Figure 1, Please show previous soil gas sampling locations relative to the proposed sampling locations for the indoor air quality assessment.*

Response: Soil gas sampling locations relative to the proposed sampling locations will be presented as part of the Site Wide Soil-Gas Evaluation.

