FINAL

Meeting Minutes

Project:	Tronox (TRX)
Location:	Conference Call / Tronox Henderson Facility
Time and Date:	9:00 AM, December 17, 2009
In Attendance:	NDEP – Brian Rakvica, Shannon Harbour
	Neptune – Kelly Black, Paul Black (for NDEP)
	Hackenberry Assoc. – Paul Hackenberry (for NDEP)
	Teri Copeland (for NDEP)
	TRX –Tom Reed, Toni Ellington, Mike Logan, Pat Corbett
	Environmental Answers – Keith Bailey (for TRX)
	Crowley Environmental – Susan Crowley (for TRX)
	Northgate – Deni Chambers, Pascual Benito, Derrick Willis (for TRX)
	Exponent – Reneé Kalmes, Greg Brorby (for TRX)
	Chartis –Julie Diebenow (for TRX)

CC: Jim Najima, Joanne Otani, Kurt Fehling, Mike Balshi

1. The meeting was held to discuss Phase B Areas II, III, and IV partially validated data in addition to remediation alternatives and risk assessment.
2. TRX provided data for Areas II, most of IV, and some of III a week in advance of the meeting. Figures for the detected constituents were included also.
3. TRX gave brief update on additional vertical delineation sampling.
   a. Area I is complete and Area II should be completed by tomorrow.
   b. TRX stated that soil gas and groundwater would be addressed at the next meeting after all of the Phase B data have been received and processed.
   c. TRX proposed meeting again in late January or early February. NDEP agreed.
   d. TRX proposed the following timeline for the submittal of the Area DVSRs:
      i. Area I: submit next week
      ii. Area II: 90% validated, submittal mid-January
      iii. Areas III and IV: submittal mid-February
4. TRX discussed the Phase B, Area II results and provided updated Tables:
   a. Organic Acids (OA):
      i. Forty (40) samples for analysis of 5 OAs were collected.
      ii. TRX did not identify any samples with concentrations greater than the BCLs.
   b. Oganophosphate pesticides (OPP):
      i. Fifty-one (51) samples for analysis of 28 OPPs were collected.
      ii. TRX did not identify any samples with concentrations greater than the BCLs.
   c. Oganochlorine pesticides (OCP):
      i. One hundred four (104) samples for analysis of 22 OCPs
      ii. TRX detected twelve (12) different OCPs.
      iii. Four (4) OCPs detected with concentrations greater than their respective BCLs.
      iv. Nine (9) OCPs had detection limits greater than the respective BCLs.
   d. SVOCs:
      i. Three hundred four (304) to three hundred five (305) samples were collected for analysis of twenty eight (28) SVOCs.
      ii. TRX detected 24 different SVOCs.

iii. Only hexachlorobenzene (HCB) and Benzo(a)pyrene detected greater than its BCL.
iv. Many of the elevated HCB detections seem to be co-located with elevated dioxin detections.
v. TRX evaluated HCB using Method 8270 (SVOC) and Method 8081 (OCP) and determined that method 8270 provides more usable data.

e. VOCs:
i. Forty four (44) to three hundred fifty one (351) samples were collected for analysis of sixty nine (69) VOCs.
ii. TRX detected forty two (42) different VOCs.
iii. Two (2) VOCs detected with concentrations greater than their respective BCLs.
iv. One (1) VOCs had a detection limit(s) greater than its BCL.
v. Chloroform was detected greater than the BCL mostly at the groundwater interface. Additionally according to Plate 4, six (6) samples exhibited concentrations greater than the BCL that were above the groundwater interface. TRX to investigate.
vi. TRX will update Plate 4 with the VOC data from Area I to include benzene and carbon tetrachloride. **ACTION ITEM.**

f. TPH:
i. One (1) to twenty six (26) samples were collected for the three TPH analyses.
ii. Oil range and diesel range TPH concentrations were detected in four (4) and seventeen (17) samples greater than the former NDEP Action Level of 100 ppm TPH.

g. PCBs:
i. Seventy eight (78) samples were collected for Aroclor analysis.
ii. Nine (9) samples were collected for congener analysis.
iii. One (1) Aroclor detection greater than the BCL was reported.
iv. Six (6) Aroclors had detection limits greater than their respective BCLs in 3-4 samples.
v. Hold time for PCB analysis is one year.
vi. TRX stated that the samples that have elevated detection limits will be submitted for congener analysis. TRX will submit a recommendation to NDEP. **ACTION ITEM.**
vii. NDEP will review the Montrose data and provide an advisory to TRX regarding the types of PCBs that have been found.

h. Cyanide:
i. Two hundred sixty six (266) samples were collected for cyanide analysis.
ii. Four (4) detections were reported.
iii. No concentrations over the BCL were reported.

i. Perchlorate:
i. Three hundred fifty one (351) samples were collected for perchlorate analysis.
ii. Three hundred forty four (344) detections were reported.
iii. Twenty six (26) results were greater than the BCL.

j. Dioxins/Furans:
i. Eighty nine (89) samples were collected for dioxin/furan analysis.
ii. Eighty nine (89) detections were reported.
iii. Nineteen (19) samples had concentrations greater than 1 ppb.

k. Asbestos:
i. Data reported for Areas I – IV.
ii. One hundred ninety five (195) samples were collected for asbestos analysis.

iii. Screening levels of greater than five (5) chrysotile and equal to or greater than one (1) amphibole fibers were used.
iv. Sixty six (66) detections were reported for chrysotile fibers.
v. Seven (7) samples had detections greater than five (5) chrysotile fibers.
vi. Highest detection was twenty nine (29) chrysotile fibers.
vii. Twenty two (22) detections were reported for amphibole fibers.
viii. Twenty one (21) samples had detections of one (1) fiber or greater.
ix. Highest detection for amphibole fibers was six (6)
x. TRX will investigate site-specific risk-based action levels for asbestos.
xi. TRX stated that the dimensional data for the fibers will be included in the Area I DVSR. TRX will also provide the dimensional data to Neptune prior to the Area II, III and IV DVSR submittal. **ACTION ITEM.**

l. Metals:
i. Three hundred fifty one (351) samples were collected for each of thirty one (31) metals.
ii. All thirty one (31) metals were detected.
iii. Five (5) metals were detected at concentrations greater than their respective BCLs.
iv. TRX conducted statistical analysis on the metals data to compare to background concentrations.
1) Three soil horizons were used for comparison:
a) Shallow soils: less than or equal to 10 fbgs
b) Middle soils:10 fbgs to MCF contact
c) Deep soils: MCF
2) The following was reported for the shallow soils:
a) Sixteen (16) metals were reported as above background.
b) Eight (8) were reported as not exceeding background.
c) Seven (7) were reported as needing additional statistical evaluation.
3) The following was reported for the middle soils:
a) Eleven (11) metals are reported as above background.
b) Fifteen (15) were reported as not exceeding background.
c) Five (5) were reported as needing additional statistical evaluation.
4) The following was reported for the deep soils:
a) Fourteen (14) metals are reported as above background.
b) Eleven (11) were reported as not exceeding background.
c) Six (6) were reported as needing additional statistical evaluation.
5) TRX stated that additional statistical evaluation was chosen for the analytes that had a p-value of 0.99 but failed other tests. TRX wants to further analyze these results.
6) NDEP stated that if the concentrations of the analyte in question do not exceed the BCL for the analyte, then additional analysis is not good use of the limited resources that are available.
v. Arsenic was the most pervasive.
1) TRX separated the arsenic data into less than and equal to 10 fbgs and then greater than 10 fbgs in the included Plates.
2) The deeper samples exhibited higher arsenic concentrations.

3) TRX compared the shallow arsenic data to a 18 ppm comparison level, which is 10 times the BCL for arsenic. NDEP questioned the 18 ppm comparison level and stated that justification would need to be provided in order to use this level.
4) NDEP stated that the arsenic data should also be shown as compared to background as well. TRX will create additional figures for background comparison. **ACTION ITEM.**

vi. Lead

1) It was noted that the toxicity values for lead may be changing. NDEP will look into this issue. **ACTION ITEM.**

m. Radionuclides:
   i. Uranium series in general was greater than background conditions in the middle and deep zones (see above for shallow, middle, and deep soil horizon descriptions).
   ii. TRX stated that secular equilibrium was demonstrated (Table 4).
   iii. NDEP stated that secular equilibrium could exist even with uranium leaching from the soil due to anthropogenic causes. TRX needs to investigate this possibility using the leaching data collected during Phase B. Leaching potential for all chemicals, including uranium will be presented at the next Area meeting. **ACTION ITEM.**
   iv. TRX stated that the deep background data set has data from approximately 140 to 150 fbgs.
   v. TRX should additionally investigate the effects on radionuclide concentrations from depth and contamination from POSSM.
   vi. Both NDEP and TRX agree that there is not enough time to conduct another background investigation.
n. TRX will analyze data to determine whether elevated compounds and/or detection limits are co-located with other contaminants for additional characterization or remediation decisions by creating figures showing exceedances of the BCLs vs. non-exceedances for shallow soils and 10 fbgs. **ACTION ITEM**
o. TRX will update the Plates with additional Phase B data as it is received.

5. Several issues (items 5-10 in the meeting minutes) were discussed as a "brainstorming" session regarding potential remediation at the Site. Conceptual approaches/asbestos.
   a. TRX and Northgate are currently conceptualizing remedial approaches by considering haul road placement, disposal options (APEX, US Ecology, CAMU, etc.), excavation scenarios, volume of excavation, soil gas and groundwater concerns, etc. NDEP expressed concerns regarding TRX resources versus the timeframe to complete the work.
   b. Asbestos:
      i. TRX working on recalculating the asbestos risk numbers.
      ii. TRX currently using the Rule of Thumb of greater than 5 chrysotile fibers and equal to or greater than 1 amphibole fiber as a clean-up level.
      iii. NDEP noted that the asbestos has many locations that are co-located with dioxin/furans and HCB.
6. Risk Assessment. NDEP and TRX discussed deterministic vs. probabilistic risk assessment (PRA).
   a. TRX wants to consider using EPA guidance to integrate probabilistic methods on the exposure parameters at the Site into the deterministic risk assessment especially for dioxin and hexachlorobenzene.
   b. TRX believes that this will make the exposure scenarios for the Site more realistic.

c. TRX stated that EPA OSWER using 5 – 20 ppb for dioxin.
d. NDEP stated that TRX needs to submit a work plan for a deterministic risk assessment first for approval.
e. NDEP has supplied TRX with guidance on the work plan in the past.
f. TRX to submit a work plan for a deterministic risk assessment that will include how probabilistic risk assessment may be conducted and integrated. **ACTION ITEM.** NDEP expressed a concern that this has been in development for over a year and is still not completed.
g. NDEP suggested that TRX do preliminary calculations for the probabilistic risk assessment to determine whether the new risk assessment numbers will be worth the time, effort, and cost. (i.e. how much excavation would actually be eliminated with the new risk numbers? Is this a sufficient volume reduction to move forward?)
h. NDEP again expressed great concern about the variety of tasks that TRX is working on versus resources versus time and indicate that PRA may not be logistically feasible.
i. NDEP also expressed that this may not be a good use of resources if the benefits of performing PRA are slight.

7. TRX inquired about instituting engineering controls for the Site as an alternative to remediation.
    a. NDEP stated that with the bankruptcy that TRX would have trouble providing the State with financial assurance that the engineering controls would be maintained.
    b. TRX would at a minimum establish a fund for the maintenance of any engineering controls.
    c. TRX also suggested deed restrictions.
    d. NDEP would also want assurances that these would be properly monitored and has concerns because of the bankruptcy proceedings and the lack of financial assurance to complete any work at the site in the future.
    e. NDEP expressed that these options would not be feasible for consideration without significant funding in place to fund the future remedial costs as well as the O&M costs.
8. TRX stated that the CAMU may not have enough capacity to meet TRX's entire disposal needs. NDEP disagreed and encouraged TRX to discuss this matter with BRC. NDEP noted that this is a miscommunication issue.
9. NDEP will check internally about the viability of TRX having an on-Site CAMU. **ACTION ITEM.** NDEP noted that this is very unlikely as the time to get a permit is a minimum of six months and this does not match up with the needed project schedule of completion by the end of 2010.
10. TRX will provide a figure showing all sampling locations with concentrations of analytes that are greater than five times their respective BCLs as a demonstration of what PRA might be able to do. TRX thought that PRA would gain a 2 to 5 fold increase in acceptable concentrations. **ACTION ITEM.**