SAEP Risk Assessment Dated 1/10/03
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Exposure Scenario Comments

Scenarios are not clearly laid out. What will receptors actually be doing on site in the future case is sometimes unclear. It appears that the recreational outdoor use envisions a day camp as representing a maximal outdoor future use. However, a maximal indoor future recreational use of the site has not be stated. Table 12-17 and pages 12-39 to 12-41 envision 52 days/year of use by young children and 162 days/yr for older children. These represent fairly limited exposures based upon the small number of days/yr and hrs per day in the building. What are these activities? Clubs? After-school programs? What about a business that involves children such as a day-care center? The latter would appear to represent a reasonable upper bound on indoor exposure for young children and should be considered for inclusion in the risk assessment (unless excluded based upon restrictions on future use of the building).

Table 12-17 – check on 97 days/yr outdoor exposure to 7-18 yr olds. At 5 d/wk for 2 months and 2 d/wk for 5 months, I don't see how you can get to 97d/yr. My calculation is 86 days assuming 4.3 weeks/month.

Table 12-17 – exposure frequency for older child recreational use – should be extended beyond the April to Oct period – if this is an attractive recreational location, one could envision 2 days/week of play March to mid-December. For younger children and adults, the lower exposure frequency is not well justified in the report. One could envision parents taking small children to the recreational area in summer to feed ducks or play on a playscape on a daily basis (unless it is specifically stated that attractions for young children such as playscapes will not be constructed). Adults could be envisioned to jog, dogwalk, play sports on a daily basis in the recreational area during warm weather months.

The point with these exposure scenarios is to construct them as reasonable upper bounds so that the risk assessment does not apply to some limited recreational use of the site. Given the uncertainties in how the site will be developed, it is probably better to assume more rather than less use and exposure. In that way, a wider array of future uses will be covered.

Table 12-17: assumption of 0.07 mg/cm2 dermal adherence for recreational adults is lower than for other adult exposures (e.g., commercial/industrial worker – Table 12-15 – adherence is 3x higher). Thus, this value needs to be explained. One could assume that dermal adherence would be at least as high from certain recreational (sports) activities as from worker exposures.

Table 12-18: sediment ingestion rates: set too low and not well justified. Hands and clothing can become muddy from shoreline sediment exposure. Soil ingestion rates should be used here for sediment as well.

Sediment contact rates appear to be too low. For example, it is assumed that children do not contact sediments outside the 2 hottest months of the year when swimming would occur. This does not allow for sediment contact from non-swimming activities along the shoreline such as walking, boating, nature study, or playing at the water's edge. These activities could concievably occur on a fairly frequent basis (including after school for school age children) over 5 months of the year (May thru Sept.). The adult exposure frequency (3 days/wk for 4 months = 52 days per year) should probably be expanded a bit to include May as well to be consistent with the children's shoreline use proposed above. Also in this table the percentage of the skin surface area that becomes wet from wading appears to be low, especially for young children on whom the water would be deeper near shore and thus cover a larger percentage of their body.

Table 12-14: Current SAEP maintenance employees: exposure to outdoor contaminants – assumed to occur on only 24 days/year. This may or may not be an appropriate baseline assumption. The discussion on Pages 12-37 to 12-38 does not mention whether interviews with workers or supervisors were conducted to determine actual site activities of maintenance workers (frequency of outdoor work; type of activities, hrs per day, etc.). Also, we do not know if there is the chance for high exposure periods where there would be a more concentrated period of outdoor work for utility line repair or other projects. The assumption of 2 days/month for this activity appears to be arbitrary.

It is also unclear why the dermal exposure skin surface area diverges between Tables 12-14 and 12-15. This should be fixed or explained in text.

Table 12-19 Finfish ingestion rates appear to be low, especially based upon what is possible for a subsistence fishing family. Ingestion rates for children thru adults for subsistence fishers should be presented and discussed vis-à-vis whether such an intense use is possible at this site (how robust is the resource?).

Exposure Point Concs. (Pg 12-44) – We typically use the maximum detect as the RME EPC if it is not possible to construct a statistically valid 95% UCL. However, we also note that there are a variety of techniques to estimate the 95%UCL for non-parametric distributions as suggested by USEPA in its ProUCL software. In contrast, the draft risk assessment defaulted to the arithmetic mean for non-parametric datasets. This approach does not take into account the variability in the dataset and could underpredict the true arithmetic mean, which is what the 95% UCL approach is intended to prevent. Please provide the USEPA, 2001b reference (or relevant pages therefrom) which was cited as supporting the approach for non-parametric datasets used in the draft risk assessment. Alternatively, use the maximum detect or non-parametric 95% UCL as described above.

The detection of high levels of certain analytes (e.g., arsenic at 22.9 in surface soil and 3550 ppm in subsurface soil; TCE at 560 ppm in recreational area surface soil; PCE at

1200 ppm in recreational area surface soil; Aroclors at 54-130 ppm in Tidal Flat sediments, etc.) raises concerns about how well the site is characterized with regards to hot spots. The risk assessment does not raise the issue of heterogeneity in the sampling data and the possible risk implications of hot spots remaining on site. Since much of the analysis is based upon average rather than 95%UCL or max detect EPCs, many of the hot spot results are diluted out of the assessment.

Toxicity Assessment – cancer slope factor for TCE shown in Table 12-37 is provisional and outdated. That value is superceded by the new draft cancer slope factor range developed by USEPA and that has gone through SAB review. The upper bound of that range should be presented since it pertains to sensitive subpopulations who may use the site (e.g., diabetics, children). The same is true for the inhalation unit risk for TCE shown in Table 12-38 (use draft new risk assessment rather than 2000, NCEA value). The submitter could choose to show risks based upon the old vs. new TCE cancer slopes for comparative purposes; hopefully this would not create a major expansion of the results and cause confusion. In any case, the treatment of the TCE toxicity information in uncertainty analysis (pg 12-78-79) is inadequate.

Lead (Pb): Pb was going to be addressed by comparison of soil/sediment concs. against the federal cleanup std of 400 ppm, with any locations above this target then subjected to biokinetic modeling. According to page 12-56, these comparisons and analysis were to appear in Section 12.4.4. However, the copy of the document I received only goes thru Section 12.4.3. Therefore, I was not able to evaluate the handling of lead risks.

Risk Characterization: There is no tabular presentation of risks by chemical. Therefor, I cannot determine which chemicals are principal risk drivers, nor spot-check risk calculations.

Indoor Air Risk Assessment: Future use of the facility may well lead to a different flux potential into the building. It was good to see this possibility described in the uncertainty section (pg 12-78). However, vapor intrusion flux modeling according to recent USEPA guidance would be helpful to better characterize this uncertainty and risk implications. Such models can adjust interior parameters to accommodate possible alterative uses for the indoor space and are a generally accepted risk assessment tool. The need for this modeling is somewhat mitigated by the fact that maximum detects over 27 sampling rounds were used for the inhalation EPCs (RME case) in all areas except one (pg 12-45 and Table 12-35). However, that one case covers an important location where there is substantial indoor air contamination (Building B-2) and where the average values are used. Maximum detects should be used in risk calculations here as well for the RME case to better characterize the upper bound and somewhat decrease the need to model vapor intrusion in the future case risk assessment.

The organization of indoor air locations into exposure point units (Table 12-13) is not well justified and appears to be inappropriate. For example, Future Exposure Point "B-2" has data from the first floor combined with data from the second floor of Bldg 2. There does not appear to be any logic to this and it will cause the average concentration to be diluted relative to what has been found on the first floor. A separate section is needed in which all the indoor air data are put together in summary tables, and combined with a detailed map, could form the basis for justifying the lumping of data for the purposes of risk assessment.

Inhalation rate for children: From Table 12-17 it is unclear what the actual inhalation rates are. The only inhalation parameter shown is the Inhalation Adjustment Factor. From footnote 10 it would appear that inappropriately high inhalation rates for children are being used. This should be double-checked and made explicit in the body of the table.