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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

(SR-6J)

February 16, 2001

Mr. D. Michael Light
Manager, Remedial Projects
Solutia, Inc.
P.O. Box 66760
St. Louis, Missouri 63166-6760

RE: Comments on Human Health and Ecological Risk Assessments
Sauget Area 1 Site, Sauget and Cahokia, Illinois

Dear Mr. Light:

A review of Solutia's January 9, 2001, submittal of the Human Health Risk Assessment and the Ecological Risk Assessment for the Sauget Area 1 Site has been conducted by the U.S. Environmental Protection Agency (U.S. EPA) as well as the following agencies: U.S. Army Corps of Engineers (and their contractor Weston, Inc.), Illinois EPA, U.S. Fish and Wildlife Service. The Illinois Department of Natural Resources has also provided informal comments at this time. Comments from all reviewing agencies on both documents are attached. Until these comments are fully addressed U.S. EPA cannot approve the risk assessments. Please re-submit the revised assessments on or before March 30, 2001. In an effort to expedite Solutia's revision process and to help assure that Solutia understands the needed revisions outlined in our comments, we plan to meet to discuss the comments on Wednesday February 21, 2001, at 9:00 am at the Sauget Village Hall.

If you have any questions regarding the attached comments before our February 21st meeting, please do not hesitate to contact me at 312/886-4663.

Sincerely,

Michael McAteer
Remedial Project Manager

cc: Thomas Martin, USEPA
Tim Gouger, USACE
Candy Morin, IEPA
Kevin de la Bruere, USFWS
Michael Henry, IDNR

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sat1-hhra-comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

COMMENTS ON HUMAN HEALTH RISK ASSESSMENT AND
ECOLOGICAL RISK ASSESSMENT

SAUGET AREA 1 SITE – SAUGET/CAHOKIA, ILLINOIS

Human Health Risk Assessment:

1. Page 3-9, Section 3.2.3.1: At the end of the fifth paragraph on this page, a statement needs to be added regarding the fact that neither U.S. EPA nor Illinois EPA consider TACO to be an ARAR and that the HHRA's use of TACO here is for screening purposes only.

2. Page 5-5, Section 5.2.2: In the first paragraph of this section the statement is made regarding the Borrow Pit lake that "...access is very difficult due to its setting." U.S. EPA does not agree with this statement. There are no barriers to accessing this lake and U.S. EPA has encountered local residents fishing in the area (i.e., Old Prairie Du Pont Creek). Please revise this statement accordingly.

3. Page 5-14, Section 5.4.3: The calculation for determining the number of days per year that a worker would not likely be exposed to soils due to weather restrictions seems to be an overestimation. A rainfall event of only .1 inches, or even up to or slightly in excess of .5 inches, would not likely restrict outdoor activities. Also, the average daily maximum temperature for St. Louis never drops below 32 degrees (F.) at any point during the year (the lowest average daily max. is 37 degrees for 12 days during mid-January). Given this, it is unreasonable to assume 27 days per year of weather restrictions relating to "cold" temperatures.

4. Page 8-13, Section 8.5: It is unclear how Solutia has come to the conclusion that remedial action is needed only at a single location at Site I based on the data. Clearly the HHRA as it now stands shows risks in excess of U.S. EPA's acceptable risk range for Sites, G, H and I. This statement needs to be revised in accordance with the data.

Ecological Risk Assessment

1. Page 10: Under the discussion of the Bald Eagle, it should be noted here, as well as in other areas of the report where discussing the Bald Eagle (i.e., page 29), that personnel from both U.S. EPA and Illinois EPA spotted two bald eagles on-site (in area of Site Q at Sauget Area 2) in late 1999.

2. Page 16: In the discussion relating to Biota there is a statement regarding the fact that no fish were present in Dead Creek Segment F. Is this a result of low water levels or no water in the segment at that time? This should be explained in the text.

3. Page 26: The statement in the first full paragraph on this page that both the reference areas and the Site study areas are both impaired to the same degree seems to conflict with the statement in the paragraph above it: "The number of organisms in reference location Ref 2-1 is greater than the other stations by an order of magnitude." Are the "other stations" referred to here at the Site or other reference locations?

4. Page 45 – Summary and Conclusions: U.S. EPA has a general concern with the conclusions reached by Solutia regarding known damage and potential risks to the environment from contamination in Dead Creek Segment F and the Borrow Pit Lake. The assessment over emphasizes the results that indicate little or no risk to certain areas of the Site. However, of more concern to U.S. EPA and eventually the public, are those study results that clearly indicate known or potential damage to the environment at the Site. This section must be revised to include and elaborate on the following facts:

- numerous contaminants of concern exceed ecological benchmarks at that Site area, well in excess of levels found in the reference areas
- fish body burdens for mercury exceed toxic benchmarks, something not seen in the reference areas, clearly indicating that there is some potential for adverse effects on fish in the Site area
- food chain modeling indicates potential risk to great blue heron eating mercury contaminated fish at the Site
- In Creek Segment F, Probable Effects Concentrations (PEC) or Severe Effects Levels (SEL) were exceeded for six metals: cadmium, copper, lead, mercury, nickel and zinc. Threshold Effects Concentrations (TEL) were exceeded for these metals and for arsenic, iron, manganese, total PCBs, seven pesticides and fluoranthene - again this indicates a real potential for adverse effects on biota.
- In the Borrow Pit Lake, PEC and SEL guidelines were exceeded by manganese and nickel and these metals plus arsenic, cadmium, copper, iron, lead, zinc, DDE, total DDT, gamma-BHC, and hepatchlor epoxide exceeded the TEC and LEL values.
- In the Acute Toxicity Test for Hyallela Azteca, the growth of this amphipod was statistically lower in stations 1 and 3 in the Borrow Pit Lake
- In the Chronic Toxicity Test for C. tentans, survival, emergence, and reproduction in stations BP-1 and BP-3 in the Borrow Pit Lake were significantly lower than the laboratory controls.
- Hazard Indices exceeded 1 for the river otter and herons under certain Borrow Pit Lake foraging scenarios

U.S. Army Corps of Engineers
Omaha District
Rapid Response

February 14, 2001

Michael McAteer
US Environmental Protection Agency, Region V
Superfund Program
77 West Jackson Blvd
Chicago, IL 60604

Mr. McAteer,

As requested, the U.S. Army Corps of Engineers and our Contractor, Roy F. Weston Inc, have finished reviewing the Sauget Area 1 – EECA & RI/FS, Volume II, Human Health Risk Assessment and the Ecological Risk Assessment submitted January, 2001. Our comments to these documents are provided in the attachments. Finalization of our review and comment for the EECA and RI/FS Support Sampling Plan, Volume 2, Leachate Treatability Tests will be submitted to you by February 23, 2001.

Though review of the Human Health Risk Assessment demonstrated substantial consistency with the planning documents, we cannot recommend approval given the following:

1. Prior characterization work showed organic and inorganic soil contamination greater than a percent of the soil, or higher than 10,000 mg/kg for waste compounds in many waste areas. However, the wastes and highly contaminated soils were not addressed in the risk assessment, which significantly compromised the adequacy of the assessment.

2. The Waste Boring samples were analyzed for TCLP parameters rather than Total parameters. The TCLP analyses does not further define the extent of soil contamination, though does provide a characteristic classification for off-site disposal.

3. The TCLP analyses cannot be used in the risk assessments. only total analyses can.

4. While the human health risk assessment does include the construction worker scenario with exposure to groundwater, the scenario does not include exposure to contaminated soil or wastes. Also, the leachate analyses should also be evaluated in the construction worker exposure scenario.

Human Health + Ecological Assessment

Without addressing these concerns and the comments provided in the attachments, the Human Health Risk Assessment is incomplete and misleading.

Our review of the Ecological Risk Assessment identifies numerous sections, which lack the specificity to even support the risk assessment. Considerable effort is needed to address the attached comments and develop a defensible document.

If you have any questions or comments, please call me at (402) 293-2514.

Sincerely

Timothy P. Gouger

Timothy P. Gouger, PE
USACE Rapid Response
Project Manager

USACE COMMENTS

Comments on the
Human Health Risk Assessment
USACE Thomason
Sauget Site, Illinois

February 13, 2001

1. **General Comment** - Please provide a summary of all deviations from the work plan and explanations for these deviations.

2. **Sections 5 and 6** - The construction worker scenario for waste sites was not properly evaluated since only surface soil data was used. Most of the data obtained during investigation of the waste sites could not be used to evaluate direct contact risk due to subsurface soil. It doesn't make sense to assume that the construction worker might have direct contact with groundwater in an excavation, but not the soil. The risk assessment should not be accepted until this exposure pathway is appropriately assessed.

3. **Section 6 - Paragraph 5.3.5.** The HHRA work plan stated that the recreational teenager and residential receptor risks would be evaluated both separately and in total. Is there a table in Section 6 showing these combined risks?

4. **Sections 6.1 and 8.4.1**. The same 1991 EPA guidance which is cited to support a target risk level for carcinogens of 10^{-4} also states: "A risk manager may also decide that a baseline risk level less than 10^{-4} is unacceptable due to site specific reasons and that remedial action is warranted." It also states: "Once a decision has been made to take an action, the Agency has expressed a preference for cleanups achieving the more protective end of the range (i.e., 10^{-6}), although waste management strategies achieving reductions in site risks anywhere within the risk range may be deemed acceptable by the EPA risk manager." In order that appropriate risk management decisions can be made, the risk characterization should identify all scenarios where a 10^{-6} carcinogenic risk is exceeded and selection of COCs should be based on an exceedence of this level. Remedial goal options corresponding to 10^{-4}, 10^{-5}, and 10^{-6} should then be developed.

5. **Section 8**. While it is understood that ordinances are in effect in Sauget and Cahokia prohibiting the use of groundwater as a potable water supply, this document does not evaluate whether the waste areas may be impacting groundwater used for drinking water in other locations or what future impacts the waste areas may have on area groundwater. The potential for residential nonpotable wells to become more contaminated is not evaluated. The summary and conclusions should state this.

6. **Appendix D and Appendix G**. The Region 4 guidance cited regarding background levels states that this is for use with naturally occurring inorganics and radionuclides. Background levels for anything else should not be used to screen contaminants out (soil to groundwater pathway COPC selection).

7. **Appendix G**. Regarding soil to groundwater pathway COPC selection, if a TACO screening value is not available, the contaminant should be retained for evaluation, not eliminated.

Comments on the
Human Health Risk Assessment
Sauget Site, St. Louis, Missouri
December, 2000

1. **Section 2.2 Sediment Removal Action**: Omission of Creek Segments B-F and Site M. Even if these areas are going to be subject to a removal action, they should be included in the Risk Assessment to ensure that the removal actions are sufficient and no further remedial actions will be required.

2. **Appendix D: Background Samples**: These appear to be poor choices for background samples, particularly EE-20. As the samples contain the same contaminant as the sites, it is not clear that the locations are outside the influence of the site. Although they do not greatly impact the Risk Assessment, it is not clear that they are appropriate for use in any Removal/Remedial Action Objective decisions.

3. **Appendix E and F: COPC Selection for Soils and Sediments**: Unless Transect 4 and Site N are going to be treated as a single unit for any remedial/removal considerations, include the Transect data which falls within Site N with the Site N data.

4. **Appendix H; COPC Selection for Groundwater**: For the evaluation of the waste pit areas groundwater to construction worker pathway, leachate data is available for both Sites G and I which should be included for the waste areas of those sites.

5. **Appendix J; Evaluation of Ambient Air Monitoring Data**: The screening only presents the volatile organic data. Include the other parameters and provide the air volumes used for each sample.

HHRA Beran

WESTON COMMENTS

Comments on the
Human Health Risk Assessment
Solutia, Sauget Site, Illinois
February 13, 2001 Comments

1.0 Introduction

Roy F. Weston Inc (WESTON) was retained by the Army Corps of Engineers (ACOE) and the US Environmental Protection Agency (USEPA) to review and provide comments on the *Human Health Risk Assessment, Sauget Area 1* prepared by ENSR International (December, 2000).

In general, the manner in which the HHRA was conducted was consistent with the procedure proposed in the Work Plan. Additionally, the equations used to calculate chemical exposure to the various receptors followed the paradigm recommended by U.S. EPA, and the exposure factor assumptions used in those equations were obtained, for the most part, from acceptable U.S. EPA guidance. However we have concerns regarding the procedure used to select COPC and the data used to calculate exposure point concentrations (EPC) for soil and sediment. First, we believe that determination of COPC based on comparison with TACO values may be inappropriate (see comment in review of Appendix C). Second, it is our understanding that representative sampling may not have been used to estimate EPC in the various areas of the Sauget site. Inspection of historical soil data from Areas H and I of the Sauget site corroborated this concern. This issue in particular is addressed in the ACOE review comments. Based on these two issues, the results and conclusions of the HHRA may not be representative of true conditions at the site, regardless of the "correctness" of the approach used to characterize risk.

Comments are provided below for the Work Plan, the technical sections of the HHRA and the supporting appendices. Note that much of the supporting methodology for the performance of the risk assessment was provided in the attendant appendices. Consequently, some of the more substantive comments are associated with the review of those appendices.

Comments to the Work Plan

The Work Plan is incorporated into the body of the Sauget HHRA as Appendix A. The purpose of examining the Work Plan was to develop a clear understanding of the process that ENSR proposed to follow in the risk assessment with regard to the following:

- Selection of COPCs
- Application of toxicity benchmarks
- Identification of potential exposure scenarios/receptors
- Structure of the exposure algorithms
- Assumptions regarding parameter values in the exposure algorithms
- Characterization of risk
- Uncertainty analysis

In general, the approach specified in the Work Plan follows U.S. EPA guidance. The conceptual site model accounted for all conceivable pathways and routes of exposure and respective receptors. The proposed handling of data (including "non-detects"), comparison with background, and the calculation of exposure point concentrations followed the EPA paradigm.

WESTON understands that EPA had previously approved the Work Plan; however, during examination of the document, some technical issues were identified in Section 5 (Exposure Assessment) that might not be appropriate or that are erroneous. Those issues are addressed below.

Specific Issues –

Soil Adherence Factor Tables - Small discrepancies were noted for total soil mass on some body parts when surface area and soil loading were multiplied.

Those were probably the result of data truncation or rounding. However, please check the calculation and provide an example.

Section 1 – no substantive comments

Section 2 – no substantive comments

Section 3 –

Specific comment – Section 3.3.6, line 4, change Figure 3-9 to Figure 3-7.

Section 4 –

All RfDs and CSFs reported in Tables 4-1 through 4-4 were confirmed against values reported in IRIS, HEAST, and the latest EPA Region 3 RBC Table. No discrepancies were found.

Section 5 –

The procedures and assumptions described in Section 5 of the HHRA are consistent with those proposed in the Work Plan. The CSM presents a reasonable array of receptors to site-related chemicals.

The equations used to characterize exposure basically follow the EPA paradigm. Also, most of the exposure factor assumptions used in the exposure characterization (presented in Tables 5-2 through 5-13) are based on EPA guidance, and are reasonably conservative. However, for the adult and child resident scenarios, the total soil mass values for feet and area-weighted soil adherence factors presented in Tables 5-11 and 5-12 are incorrect. Those values were carried through from the Work Plan. Again, we refer the authors to comments in the review of the Work Plan.

Weston agrees with the approach described in Section 5.6.1.1 regarding calculation of

EPCs. However, clarification is necessary regarding the calculation of the 95% UCL for lognormally distributed data. Specifically, the authors stated that the H-statistic values were obtained from Gilbert (1987). For many of the summary statistics reported in the Tables in Appendix B, the numbers of samples used to generate the summary statistics were equal to 2, 4, 6, 8, 9, and 43. However, the H-Statistic Tables in Gilbert (1987) only include H-statistic values for n = 3, 5, 7, 10, 12, 15, 21, 31, 51, and 101. H-statistic values for n other than those presented in the Tables cannot be interpolated linearly. Values are derived using four-point Lagrangian interpolation. The authors need to expand this discussion to explain how H-statistics were interpolated, and include an example to demonstrate the technique.

The AAFs presented in Table 5-41 are consistent with those values reported in Appendix O (Absorption Adjustment Factors) and the Tables in Appendix P. However, the authors are referred to comments regarding the use of AAFs in the review of Appendix O. Permeability constants in Table 5-42 are consistent with those reported in the EPA document, *Dermal Exposure Assessment: Principles and Applications* (EPA, 1992b). The surrogate values presented in Table 5-42 appear reasonable. Additionally, the calculated values in Table 5-43 are correct.

The COPC in Tables 5-14 through 5-17 and 5-21 through 5-40 are consistent with those presented in Tables 3-1 through 3-7, and Appendices E through J. Additionally, the EPC values for those COPC are consistent with those in Appendices B and E through J.

Section 6 –

Section 6 (Risk Characterization) of the Sauget HHRA was generally well written and contained all of the elements that one would expect of a qualitative analysis of uncertainty. The discussion regarding the risks to the various receptors was consistent with the numerical summaries presented in Tables 6-1 through 6-28. The risk and hazard values in those Tables were compared with those reported in Appendix P. We found only one discrepancy. On Table 6-2 (Indoor Worker),

the HQ associated with inhalation exposure to 4-methyl-2-pentanone intruding to indoor air from groundwater in Site G is listed as NC (Not calculated, no dose-response value or not a constituent of potential concern in this area/medium). However, it is listed as a COPC in Table 3-5 (EEG-107) and Appendix H, and the corresponding Table in Appendix P reports an HQ of 2.30E-03 for that compound. We found no other discrepancies in the Section 6 Tables.

Section 7 –

Section 7 (Short-Term Risk Assessment) of the Sauget HHRA was consistent with the approach described in the Workplan. Additionally, the STCOPC identified in Section 7 are consistent with those reported in Appendices E through J. Weston has one concern regarding the screening of calculated excavation air concentrations against USEPA Region 9 air PRGs to evaluate potential STCOPC for that pathway. As indicated in the review of Appendix L, the authors calculated the excavation air concentration by multiplying the groundwater concentration by a groundwater-to-air attenuation factor. The EPA methodology cited by the authors does not recommend the use of an attenuation factor in the model. Additionally, there is no indication that the authors accounted for temperature-dependence for such parameters as Henry's Law constant values or air and water diffusion coefficients. Thus, the calculated excavation air concentrations used in the HHRA may not be appropriate.

> Specific comment – Section 7.2.6, second paragraph, line 2: change "concentrations in to" to "concentrations in air to"

Section 8 –

In general, the information presented in Section 8 (Summary and Conclusions) is consistent with the Workplan and the other Sections of the HHRA. However, Section 8.4.3 (Potential Carcinogenic Risk) does not have the same level of detail as that presented in Section 8.4.2 (Non-Carcinogenic Risk

Characterization). Instead, the authors included a short discussion of remediation goals (RG). Aside from a brief comment in Section 6 that RGs are calculated for each COC in Section 8, this was the first time that calculation of RGs was discussed in the HHRA. Although the approach appears to be appropriate for this HHRA, the authors need to expand the discussion to include the source of the approach, an annotated example to facilitate understanding, and situations in which this approach may not be appropriate. Consider the following example as it applies to the limited discussion in Section 8.4.3. If there were four chemicals in a medium that had a cumulative risk of 5E-04, one of those chemicals had an EPC of 120 mg/kg and a risk of 1.2E-04, and the target risk is 1E-04, how would this approach be used to calculate RGs for the four chemicals? Using the approach described in Section 8.4.3, one would wind up with a negative target risk (-3E-04) and RG (-300). Obviously, one can have neither a negative risk nor a negative RG. Is something missing from the RG calculation description, or is the approach flawed?

Appendices

The following Appendices were reviewed to determine the accuracy with which various parameters used in the exposure equations were calculated:

- B – Summary Statistics
- C – Screening Values
- D – Background Calculations
- E – COPC Selection for Soils and Sediment for Residential Scenarios
- F – COPC Selection for Industrial Scenarios
- G – COPC Selection for the Soil to Groundwater Pathway
- H – COPC Selection for Groundwater
- I – COPC Selection for Surface Water and Fish Tissue
- J – Evaluation of Ambient Air Monitoring Data

- K – Calculation of Indoor Air VOC Concentrations From Groundwater
- L – Calculation of Excavation Air VOC Concentrations From Standing Water
- M – Calculation of Outdoor Air VOC Concentrations From Groundwater
- N – Calculation of Produce Concentrations
- O – Absorption Adjustment Factors (AAFs)
- P – Risk Calculation Spreadsheets
- Q – Assessment of Potential Lead Exposures
- R – Toxic Endpoint Analysis

Comments regarding the various Appendices are presented below.

Appendix B –

The format of the summary statistics is consistent with that proposed in the Work Plan. Additionally, the EPC values were selected consistent with the procedure described in the Work Plan and Section 5.5.1.1 of the HHRA. However, there is some concern regarding calculation of the 95 % UCL for lognormally distributed data in the review of Section 5.

Specific comment – Footnotes are missing from the Tables.

Appendix C –

In general, values for Appendix C are consistent with the TACO values listed in Appendix B of the Work Plan. However, based on a letter from Paul Takacs (IEPA) to Michael McAteer (U.S. EPA, Region 5), it may be inappropriate to use TACO values as screening levels for COPC because TACO values are health-based instead of risk-based, and also are not intended to be protective of the environment (Personal communication from P. Takacs to M. McAteer regarding the Sauget Area 1 Sites, December 18, 1998). This may present a potential flaw in the HHRA.

The values in Table C-5 are consistent with those reported in the Region 9 1998 PRG Table, and values in Table C-6 are consistent with those reported in the Region 3 2000 RBC Table.

Appendix D –

Calculation of background levels of chemicals in the various media was consistent with the methodology described in Section 3.2.2 of the HHRA. No calculation errors were identified.

Appendices E through H –

The identification of COPC in these Appendices follow the procedures presented in Section 3 of the HHRA. The maximum detected concentrations in these Tables are consistent with those values contained in Appendix B of the HHRA. The TACO Class-I and Class-II values in these Tables are consistent with those presented in Appendix C. However, please refer to comments regarding the use of TACO values in our review of Appendix C. Background concentrations presented in these Tables were calculated correctly based on the approach described in Section 3 of the HHRA. No discrepancies were found in the data in these Tables.

Appendix I –

The identification of COPC in these Appendices follow the procedures presented in Section 3 of the HHRA. The maximum detected concentrations in these Tables are consistent with those values contained in Appendix B of the HHRA. The TACO Class-II values in these Tables are consistent with those presented in Appendix C. However, please refer to comments regarding the use of TACO values in our review of Appendix C. Background concentrations for surface water presented in Table I-1 are consistent with those in Appendix D. Calculation of background concentrations for fish tissue is consistent with the approach described in Section 3. RBC values for fish in Table I-3 are consistent

with those reported in Table C-6 and the Region 3 2000 RBC Table. No discrepancies were found in the data in these Tables.

Specific comment – Footnote "g" is missing from Table I-3.

Appendix J –

The identification of COPC in these Appendices follow the procedures presented in Section 3 of the HHRA. The ambient air PRG values in Tables J-2 through J-5 are consistent with those reported in the Region 9 1998 PRG Table. The 100 times PRG values in Table J-6 were calculated correctly. No discrepancies were found in the data in these Tables.

Specific comment – PRG footnote in Tables J-2 through J-5 refers the reader to Table x for full references. Authors need to supply a Table number to this footnote.

Appendix K –

In general, values for Appendix K were generated using the EPA spreadsheet version of the Johnson and Ettinger model. Values for 4-methyl-2-pentanone were calculated using the RBCA Toolkit for Chemical Releases. Most of the required parameter inputs were consistent for all chemicals evaluated with both models. However, we found several discrepancies with regard to the concentrations of chemicals groundwater. Only the first data sheet in Appendix K listed the initial groundwater concentration as μg/L. Whereas all other data sheets in Appendix K listed the concentrations as mg/L, most of the groundwater concentrations appear to be representative of μg/L units. Most of the groundwater values used for the RME indoor air calculations match those reported in Appendix L. However, for the RME calculations of indoor air VOCs relative to Fill Area G (EEG-107) and Fill Area I (EE-14), groundwater concentrations of benzene, chlorobenzene, naphthalene, PCE, toluene, TCE,

and VC for sample location EEG-107, and chlorobenzene for sample location EE-14 are different than those reported in Appendix L (Table L-2). With regard to those data used to calculate MLE indoor air VOCs, none of the groundwater concentrations used in the Johnson and Ettinger model or the RBCA Toolkit for Chemical Releases matched the values reported in Appendix L (Table L-3).

Appendix L –

Appendix L describes an EPA RCRA model used to predict volatilization of chemicals from standing water. In their description of the model, the authors indicated that the concentration of VOCs in air within the excavation trench was derived by dividing the chemical emission rate (Q) by the product of the water surface area (A), wind speed (U) and a constant of 0.05 (apparently related to the diffusion height above the water surface). Q is actually a complex function, requiring several intermediate calculations related to mass transfer coefficients. Three aspects of Appendix L preclude a complete understanding of the model described by the authors. First, one of the parameters, effective diameter (d_e), is said to be equal to $(4A/B)^{0.5}$. we assume that A is representative of the water surface area, but B was not identified anywhere in the model description. Second, the authors did not include any of the values used in the model for several of the model parameters. For example, the model calls for Henry's Law constant values as well as air and water diffusion coefficients. However, those parameters are temperature-dependent. Therefore, they should be calculated using such methodologies described by Lyman et al (1990) or Baum (1998). Third, when we tried to verify the trench air calculations using the equation described above, we realized that the authors had not used the equation that they had described in Appendix L, but instead, calculated the excavation air concentration by multiplying the groundwater concentration by a groundwater-to-air attenuation factor. The utility of that parameter also had not been discussed in Appendix L. In fact, the groundwater-to-air attenuation factor was not even

mentioned in the model description. The authors need to revise Appendix L by describing all of the steps that they undertook to calculate the components of air in a hypothetical excavation trench.

Appendix M –

The authors indicated that outdoor air VOC concentrations from groundwater were predicted based on the method recommended in ASTM PS-104 and calculations were completed using the RBCA Tool Kit for Chemical Releases software. The authors indicated further that site-specific values for depth to groundwater, width of source zone area, and vadose zone thickness were incorporated in the evaluation. However, Table M-1 reports default values for those parameters that were subsequently used in the RCBA model. The authors also indicated that parameters were summarized in the attached modeling printouts; however they were only listed in Table M-1, a spreadsheet printout that was not generated by RBCA. Consequently, there is no way to ascertain that the parameter values listed in Table M-1 were used in the model runs. The RBCA Site Assessment Summary Tables included in Appendix M only contain one page ("page 5 of 7") for each run. Risk assessments need to be as transparent as possible. In order to achieve that transparency, and to facilitate the review of this document, the authors need to supply the other input data (as they did with the Johnson and Ettinger model in Appendix K).

Appendix N – no substantive comments

Appendix O –

There are some significant concerns regarding the calculation of absorption adjustment factors (AAFs) for the dermal-water scenarios. First, we disagree with the author's argument that AAFs can have numerical values greater than one. An absorption fraction is defined in the EPA Exposure Assessment

Guidelines (EPA, 1992a) as a fraction of applied dose that is absorbed after a designated time. It is a cumulative number and can increase with time to a possible maximum of 1. The equation form is:

$$AF = \frac{\text{Units of Mass Absorbed}}{\text{Mass Applied}}$$

Additionally, the EPA Dermal Exposure Guidance (EPA, 1992b) specifically states that the permeability coefficient-based approach is advocated over the absorption fraction approach for determining the dermally absorbed dose in compounds in an aqueous medi[um] [sic]. Also, it appears that the authors used both AAFs and permeability constants to assess dermal exposures to chemicals in groundwater.

Appendix P –

The AAFs and toxicity values presented in the Tables in Appendix P are consistent with those values reported in Appendix O (Absorption Adjustment Factors), Section 4 (Dose-Response Assessment), Tables 4-1 through 4-4 and Section 5 (Exposure Assessment), Table 5-41. However, we refer the authors to the comments regarding the use of AAFs in the review of Appendix O. Permeability constants are consistent with those reported in the EPA document, *Dermal Exposure Assessment: Principles and Applications* (EPA, 1992b), Table 5-42 of the HHRA, and those calculated in Table 5-43 of the HHRA. Values for RfDs and CSFs used in the Tables of Appendix P are consistent with those reported in Tables 4-1 through 4-4 of the HHRA. Lastly, the exposure assumptions used for the various receptors in Appendix P are consistent with those proposed in the Workplan, discussed in Section 5 of the HHRA, and summarized in Tables 5-2 through 5-13.

Appendix Q –

The description of the USEPA IEUBK model for children and the adult lead exposure model are consistent with the descriptions in The EPA Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children (EPA, 1994) and Bowers et al. (1994). Figure Q-1 and Tables Q-1 and Q-2 were missing from the Appendix.

> Specific comment – In the discussion of Lead in Drinking Water on page Q-3, the authors stated that a water ingestion rate of 0.005 L/day was substituted for all age groups evaluated. The authors should repeat the rationale that they included on page Q-8 (Water Ingestion Rate) for this assumption.

Appendix R – no substantive comments

Comments on the

Ecological Risk Assessment

Solutia, Sauget Site, Illinois

January 2001

1.0 Introduction

Roy F. Weston Inc (WESTON) was retained by the Army Corps of Engineers (ACOE) and the US Environmental Protection Agency (USEPA) to review and provide comments on the *Ecological Risk Assessment, Sauget Area 1* prepared by Menzie-Cura and Associates (January 2001). Comments are provided for the technical sections of the ERA and the supporting appendices.

General Comments:

1. All sections lack in either site-specificity and/or sufficient detail to support the risk assessment. (Specifics cited for each section below.)
2. There are several factors in this report that make it difficult to understand and interpret. The organization of the document does not follow convention. For example, much of the information presented in Section 7 – Risk Characterization is usually presented earlier in the text. For instance, the "Purpose and the Rationale" should be given in the Problem Formulation and the "Approach" should be given in the Analysis Phase, either in the Exposure Assessment or in the Effects Assessment. A paragraph at the beginning of the Risk Assessment explaining the set-up of the document would be helpful. The organization within sections, in particular Section 7, is confusing and has redundancies. Footnotes are not explained in a good number of tables; tables in Appendix C lack appropriate numbering; chemical listing order/classification is not always consistent. Sometimes information is provided, but the onus is on the reader to make connections across sections and make logic jumps. The number of decimals shown for a concentration is inconsistent in tables among chemicals and among tables within chemicals. Issues such as these result in a risk assessment that is not transparent.

ERA Sevold

3. While it is understood that the reference area selection was discussed with EPA representatives, a good explanation of why these locations were selected is not presented in the report. Physical characteristics (such as surface water TSS and pH and sediment TOC and grain size) are not provided for the site or reference areas. Since this information is not provided, it is not possible to determine if the reference areas are actually appropriate. Without knowing if the reference area is appropriate, elimination of chemicals based on reference concentrations cannot be accepted. In addition, supposition of no additional risk from the site cannot be made.
4. The Work Plan was very general, but was approved with the understanding that more site-specific information was to be presented in the Risk Assessment document. This site-specific information, for the most part, has not been added. (Specific instances cited below.)
5. There was no discussion regarding the meeting of data quality objectives (DQOs). Since raw data is not provided, it is not even possible to check if the proposed detection limits were met. Particularly interested in the case of contaminants with sample quantitation limits are greater than benchmarks.
6. Page 1, Paragraph 2, Sentence 1 indicates that the risk assessment is only to be performed on the lower portion of CS-F and the Borrow Pit Lake. However, there is a terrestrial component to the risk assessment. Wording must change to make it clear that the floodplains of the upper portions of Dead Creek are not being remediated under the removal action, and that a screening-level risk assessment is also being conducted for these terrestrial areas.
7. Issues with the biological collection efforts. How often are CS-F and Borrow Pit Lake dry? If it is only a small percentage of the year, may not have sampled at the appropriate time. In addition, not sure how appropriate the plant species and tissue type (e.g., stems versus seeds), shrimp, and/or clam are for the receptors selected.
8. References for specific information [e.g., life history information of the otter and muskrat (pages 10-11)] are often missing.
9. All three components of a sediment triad were completed; however, they were never integrated into a triad evaluation.

10. Although Table 8-1 is called a "Weight of Evidence Evaluation of Ecological Risk," a weight of evidence is never presented in the risk assessment. What a weight of evidence is supposed to encompass is briefly touched upon in Section 4, but *a priori* selection of weights and determination of what responses are considered low versus high for each endpoint is not included.

Specific Comments:

Section 1 - Introduction

1. A brief introduction of the site, including historic and current activities would be helpful. It should not be necessary for a reviewer to find previous documents to determine if the facility is still operational and what types of contamination would be likely given the site use.

Section 2 – Background

2. This section appears to be an ecological characterization, if so, insufficient information is provided. This section should describe the habitat in more detail. Although the reader is referred to Section 7.2.1 for more information, and species observed or expected to occur on-site are cited, very little, if any additional information on the stream/lake characteristics and shoreline habitats appear. The length of CS-F and the size of Borrow Pit Lake are not even mentioned in this section.
3. Information provided regarding the reference sites is paltry at best.
4. Which reference areas are comparable to CS-F?
5. Figure 1-1 may be a good map of the overall site, but at least one additional map, zoomed to the areas of concern for this risk assessment would be appropriate. In addition, a habitat map for the study areas (CS-F and Borrow Pit Lake) would be helpful.

6. Figure 2-1 would be more helpful if it showed the selected reference areas relative to the site. As with the site area, additional maps showing the habitat within the reference areas would be helpful.

Section 3 – Problem Formulation

7. Site-specific information is usually not provided. Examples (not all inclusive) follow:
   - Section 3.1.2 – Contaminant Fate and Transport Mechanisms: No discussion of source areas and routes of transport to CS-F and Borrow Pit Lake. Thought Dead Creek was a recharging stream and contaminants could move from groundwater to the stream. Give list of general transport mechanisms, but never discuss where in system these mechanisms are likely. Never put into context with selected COPCs.
   - Section 3.1.3 – Mechanisms of Ecotoxicity and Likely Categories of Potentially Affected Receptors: No basis for the first sentence, "The COPCs may affect the survival and reproductive capacity of benthic biota, fish, invertebrates, vascular plants, and wildlife." Chemical or even chemical class-specific toxicity information is never provided.
8. There is not a good explanation of why the river otter and muskrat were selected as receptors when these species do not appear on Table 7-17.
9. The discussion of terrestrial receptors can be likened to a footnote in section 3.1.3 – Mechanisms of Ecotoxicity and Likely Categories of Potentially Affected Receptors. Please provide more information (e.g., potential receptors) for the terrestrial evaluation.
10. Soil invertebrates are the only terrestrial receptors noted in Section 3.2 – Identification of Receptors. Site-specific terrestrial mammalian, avian, and plants receptors must be called out since the benchmarks used to screen soil concentrations can be based on any of the above, not just soil invertebrates.
11. Page 12: Earthworms are not sessile.

12. Figure 3-1: Aquatic plants can be exposed to chemicals via water uptake. Omnivorous and piscivorous fish should be split into two different groups. Both may be exposed to contaminated sediment through incidental ingestion and the omnivores may be exposed through the ingestion of aquatic plants. Piscivorous birds may also be exposed through incidental or purposeful ingestion of surface water.
13. Figure 3-1 shows the conceptual model for Dead Creek only. None is presented for Borrow Pit Lake or the terrestrial component of the ERA

Section 5 – Exposure Assessment

14. Why is the historic data (e.g., data used in the SLERA) not used in the ERA? Sample numbers and approximate locations were approved assuming that the historic data would be used.
15. 15. The COPC selection process for soil is missing from text and tables Section 5.1.1 – Sampling Locations: Should mention if surface water and sediment samples are co-located. Justification should be provided as to why another plant species was not collected in Borrow Pit Lake. Justification should be provided as to why clams and shrimp were not collected from CS-F.
16. Page 17: The TEQ calculation is not presented correctly. Missing a bracket between the sigma and the open parenthesis.
17. Page 17: Regarding treating "M" flagged values as non-detects. Believe these are more akin to J values; therefore, should be assumed to be a detect.
18. Page 18, Paragraph 1, Last sentence: First, background comparisons can only eliminate inorganic contaminants. Second, insufficient samples were analyzed for some media (e.g., shrimp) for removal from the COPC list based on background comparisons. In either case, qualitative discussions may be made regarding site concentrations compared to background in the uncertainty analysis.
19. Page 18, Paragraph 3: Ethylbenzene should not be excluded unless it is shown that it is not a potential contaminant from site activities, or it is not detected in the upstream segment of Dead Creek.

20. Page 18, Paragraph 4: States that maximum concentrations from biota are compared to maximum concentrations from reference areas. Aside from the issues already noted with the reference area comparison, no reason is given for making the comparisons differently for biota than for surface water and sediment (maximum site to twice average reference).
21. Page 18, last sentence: States that, "total concentrations of DDT and PAHs were calculated as the sum of the concentrations of individual compounds detected...." First, there is no explanation as to why for PAHs, a total exposure point concentration is used for avian receptors but and individual PAH exposure point concentration is used for mammalian receptors. Second, it appears as though total PAHs were calculated only using the selected COPCs. This is not the correct way to determine total PAHs. If you are going to assume that PAHs are additive, then you cannot screen out individual PAHs. If some of the individual PAHs are higher in the reference area, then that should be discussed in the uncertainty analysis.
22. Please provide information regarding how many individuals comprised composite samples for biota.
23. Data reduction text virtually non-existent. How were qualified data and duplicates handled?
24. Table 5-2: Please title such that it is obvious from where (CS-F, Borrow Pit Lake, or both) these data were obtained.
25. Table 5-3 is very difficult to follow. Suggest adding row lines.
26. Table 5-3 is noted as being "Concentrations in ug/kg except metals which are in mg/kg." What units apply to the surface water samples?
27. Figures 5-1 through 5-3. Only need to present the area and samples used in this assessment. Reference areas should be put in "to scale".
28. Please provide figures of biota sample locations.

Section 6 – Ecological Effects Assessment

29. This Section needs to be expanded. Additions should include (but not be limited to): explanation of the sediment triad (including the basis of the benthic community

evaluation and sediment toxicity tests) and the types of and basis for toxicity values (e.g., TRVs, benchmarks).

Section 7 – Risk Characterization

30. The text should discuss how comparisons to benchmarks are made (e.g., maximum concentration compared with available guidelines).
31. Page 21, last paragraph: Please provide more information regarding the data sources in this database. Was the sampling biased? e.g., Did it focus on industrial areas or areas suspected to be contaminated? Were the samples taken in only suspected "clean" areas? Or both?
32. Page 22, first full paragraph: Appears to be a typo in the mercury benchmark. It is noted as 25 mg/kg instead of 0.25 mg/kg.
33. Page 22, last paragraph, continued on Page 23: It is not indicated in the report whether the metals analyzed in surface water are total metals or dissolved (filtered) metals. Since the reference area has substantially higher TSS (average of 420 mg/L versus a site maximum of 160 mg/L) it would be entirely inappropriate to compare concentrations between these two areas if the metals are indeed analyzed as total. Please provide additional information as necessary in the text and tables regarding the analyses and remove text comparing concentrations if need be.
34. Suggest attaching the entire sediment toxicity report, instead of just the executive summary in Appendix E. Tables supplied do not support all of the data presented in text (e.g., page 27, paragraph 3, last sentence.) There is no indication that sediment for toxicity test was co-located with benthic invertebrate and sediment chemistry samples. In addition, chemical analysis of sediment used in the toxicity tests does not appear to have been done. The text should indicate why not or present the data.
35. Page 27, *H. azteca* Chronic Toxicity: According to page 4, Prairie DuPont Creek (PDC) reference area and Reference Area 2-2 locations were selected based on their comparability to Borrow Pit Lake. Why was Borrow Pit Lake toxicity data compared only with Reference Area 2-2?

36. Page 28, Section 7.2.1– Measure of Effect 2a: Wildlife species composition and habitat use. The way the study was designed, the data cannot be used as a measure of effect. It can only be used to establish a simple presence/absence during a very specific season and time period. It cannot, as the text states, "measure (of) the degree to which local and migratory wildlife use the habitat and the extent to which it supports their needs" or "...indicate(s) whether Dead Creek can support wildlife species comparable to unaffected reference areas." The habitat does not seem to be well documented (e.g., no maps, no species list of vegetation, no canopy estimates completed). Nor were there attempts made to quantify species present, approximate biomass, or to calculate the expected carrying capacity of the area. The data presented, while important, can only be used in the ecological characterization of the site, to help select receptors, and to discuss the site versus the reference area in a very qualitative way.
37. Page 28, last full paragraph. Does "very little submerged or emergent vegetation grow(s) in the pond" only during certain seasons and/or when the water levels are very low? Seems as though blanket statement made about year-round site conditions based on one outing in October.
38. Table 7-1 through 7-3, 7-18, 7-22, and 7-23: Benzo(a)pyrene is listed twice, with different benchmark values for each listing. Please correct. Also looks like in Table 7-18, the average value for the detected benzo(a)pyrene is incorrect. Should be 113 instead of 140.
39. Table 7-19: Titling makes it look as though food ingestion is the only thing considered in the assessment. Should re-title such that it is obvious that surface water and sediment ingestion are included. In addition, there are blank spaces, mainly in SVOCs and Dioxin TEQ that should be filled.
40. Tables 7-20 and 7-21: It is not clear what chemicals are included in these tables. Previous tables included all chemicals that were selected as a COPC. These tables leave out some, but not all chemicals that were listed as COPCs but were not detected in surface water. Please add all COPCs to table.

Section 8 – Weight of Evidence Discussion of Ecological Risk

41. Page 41, 1st paragraph: Although it is expected to see impacts to the benthic community due to low water level, this is a confounding factor. One cannot make the conclusion that there are no chemical-related effects if the community analyses were performed during a time when the habitat is degraded to such an extent that effects from poor habitat would mask chemical effects. The water level in the study area is not always low. Would suggest re-sampling benthic communities during a higher water level period assuming that the stream characteristics are such that a benthic community could be supported if there were higher water levels. If this is not the case, than a good explanation must be given.
42. Page 41, 1st paragraph, sentence 3: Toxicity testing were not inconclusive, toxicity was indicated. Potential causality (i.e., whether the toxicity is site-related) is not a consideration in the comparisons made for the toxicity tests. Except for the *H. azteca* 42-day tests (and there are questions as to how this was done), information regarding the site results versus the reference results is not provided.
43. Table 8-1: Comparisons to benchmarks are listed as both laboratory and literature. Similar lines of evidence should have the same category.

Section 9 – Discussion of Uncertainties and Exposure Assumptions

44. This section should be site-specific and provide much greater detail. Many uncertainties missed. Uncertainty section should also suggest which direction the uncertainty may be influencing risk. Also, there is no obvious distinction made in any of the discussion between inherent variability and uncertainty.
45. Page 44, last paragraph. This paragraph is incorrect. Uncertainty in the food chain assessment is not captured by using both a NOAEL and a LOAEL. The uncertainty in a food chain assessment is not bounded between the two toxicological benchmarks.

Appendix F

46. Page 2: $Conc_{water}$ indicates that the exposure concentration is the average surface water concentration. Tables in Section F show the maximum surface water concentration is also used. Please make text and tables consistent.
47. Page 3, Model Application: Chronic and acute (or maximum) exposures are discussed. One would assume that an acute exposure should be compared with acute toxicity values; however, only chronic toxicity values are used and no explanation is provided. Please provide.
48. Page 5, Paragraph 3: Sources for the mallard's food ingestion rate and % moisture content of diet are not provided; therefore, cannot tell if reasonable.
49. Page 7: The moisture content of fish is not presented; therefore, cannot reproduce the calculated sediment ingestion rate value.
50. Cannot check the foraging area calculations since cannot find where area of the site is presented.
51. In most tables, sediment concentrations for Borrow Pit Lake appear for every chemical, even if not detected. Should zero or blank out (preferable) the non-detected concentrations.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276

THOMAS V. SKINNER, DIRECTOR

217/782-6762

January 31, 2001

Mr. Michael McAteer
U.S. EPA Region 5
77 West Jackson Boulevard (SR-6J)
Chicago, IL 60604-3590

Reference: 1630200005 St. Clair County
Sauget Area 1 Site
Superfund/Technical
Administrative Order by Consent dated January 21, 1999
Human Health Risk Assessment
Ecological Risk Assessment
Leachate Treatability Test
Data Report

Dear Mr. McAteer:

The referenced documents for the Sauget Area 1 Site EE/CA and RI/FS were received on January 9, 2001. These review comments are due to you on February 2, 2001. You should note that I am the only Illinois EPA reviewer of these documents, therefore no risk assessor or toxicologist participated in their review.

Human Health Risk Assessment

1. Section 1 and Section 3 include numerous references to the IEPA TACO program. Illinois EPA has determined that TACO is not an ARAR because it does not satisfy the requirements of the National Contingency Plan at 40 C.F.R 300.400(g). Also, due to the potential variety of conclusions to be reached under the TACO procedures, it is difficult to determine whether TACO would be more stringent than Federal requirements. It appears that the broader issue is whether or not the use of TACO is consistent with the NCP.

2. Page 1-4. The IEPA TACO Mixture Rule is cited regarding carcinogens. Is this consistent with the provisions of RAGS?

3. Page 3-9. IEPA TACO Tier I criteria were used for the identification of COPCs for soil and groundwater. Are these the appropriate criteria or are there State and/or Federal ARARs for soil and groundwater?

4. Page 3-9. It is stated that the HHRA Workplan does not require assessment of a residential drinking water scenario even though the Site groundwater meets the criteria of 35 Ill. Adm. Code 620 for Class I groundwater. So the risk assessment was performed by using the Class II groundwater criteria. It should be noted that in consideration of the NCP's expectations as stated at 40 C.F.R. 300.430 to return usable ground waters to their beneficial uses, it may be appropriate in the Feasibility Study to evaluate Class I criteria and MCLs when groundwater ARARs are determined.

5. Page 3-9. Private wells exist in the study area along with local ordinances which prohibit the use of groundwater as a potable water supply. Are those ordinances enforceable, and do they effectively eliminate the human exposure to groundwater pathway?

6. Page 3-10. Is it appropriate to use the Class II groundwater criteria in the evaluation of human exposure to surface water? It seems likely that surface water criteria exist or can be calculated based upon standard equations, and those criteria should be used.

7. Page 3-13. IEPA's report "A Summary of Selected Background Conditions for Inorganics in Soil" is cited. Without any determination of the appropriateness of referring to that report, note that the arsenic concentrations in background soils were changed on December 21, 2000 by amendments at 35 Ill. Adm. Code 742 Table G. For counties within metropolitan statistical areas the concentration is 13.0 mg/kg and for counties outside metropolitan statistical areas the concentration is 11.3 mg/kg.

Ecological Risk Assessment

8. Page 17. Section 5.1.3. When multiple values were available for a compound in the COPC selection process, the Illinois value superseded the national value, which superseded the Great Lakes value. Is this appropriate or should the most conservative value be used?

9. Page 18. Was frequency of detection the only criteria considered for eliminating ethylbenzene and 2,4-dimethylphenol as COPCs?

10. Page 38. Regarding selenium in site soils and the reference to the 1994 Illinois EPA report, the last sentence of that paragraph should be revised as follows: "Therefore, the selenium concentrations detected in site surface soil are likely to be within the range of Illinois background, although selenium was not detected in the three site-specific background samples".

Illinois EPA's August 1994 report "A Summary of Selected Background Conditions for Inorganics in Soil", states that the data can be used to evaluate the plausible validity of any site-specific background data, but are not meant to replace the collection of site-specific background data for sites.

11. Page 46. There are several Federal and State threatened and endangered species which occur in the vicinity of Creek Segment F and Borrow Pit Lake. This report appears to be an incomplete evaluation of them as receptors. Also, both the Federal and State Endangered Species Acts should be evaluated as ARARs in the Feasibility Study.

Also note that a bald eagle was observed on December 7, 2000 along the Mississippi River adjacent to Site Q at the Sauget Area 2 Site less than one mile from Borrow Pit Lake.

Leachate Treatability Test

12. It may be helpful in the evaluation of the testing results to include the American Bottoms POTW's discharge standards.

13. In addition to the tests which were performed separately, a series of tests may be appropriate to determine which methods when performed in series are best suited to achieve the required discharge standards.

Data Report

No comments.

You should note that these comments do not address issues of natural resource injury, natural resource damage assessment, and natural resource restoration. If you have any questions, please call me at 217/785-9397.

Sincerely,

Candy Morin

Candy Morin, Remedial Project Manager
National Priorities List Unit
Federal Site Remediation Section
Bureau of Land

cc: Mike Henry, IDNR
Kevin de la Bruere, USFWS

sgtarea1/datarsk01.01

US Fish and Wildlife Comments on
Ecological Risk Assessment for Sauget Area 1
Sauget
St. Clair County, IL

General Comments:

1. The Ecological Risk Assessment (ERA) is supposedly for all of Sauget Area 1, yet it is limited to only Creek Segment F (CS-F)and the associated "Borrow Pit Lake" (BPL). There is no consideration of terrestrial habitats or mention of Sites G,H,I,L,M, or N in the ERA. Therefore, this document does not present a complete assessment of risk associated with the Sauget Area 1 Superfund site.

2. Some feeding guilds are not considered in the ERA. Specifically, there is no mention of vermivores, insectivorous birds and mammals, non-piscivorous raptors, amphibians, and reptiles. These pathways remain uncharacterized and the risks associated with them unknown.

Specific Comments:

Figure 3-1: The Conceptual Site Model does not address soil contamination as a source and link to burrowing mammals, invertebrates, and raptors, and vermivorous wildlife as would be the case in a terrestrial habitat.

Section 3.1.2: The scope of the fate and transport mechanisms needs to be expanded to include areas other than aquatic habitats. For example, consider COPC's leaching from landfills to soil, etc.

Section 3.1.3: Insectivorous birds may be affected by contaminant uptake in benthic macroinvertebrates if they are eaten after a hatch. Therefore, insectivorous birds should be considered as a potentially affected receptor in an aquatic system.

IBID.: In order to properly characterize the site, there needs to be an evaluation of potential terrestrial receptors that may be exposed to contaminants from non-aquatic habitats in additional operable units associated with the site.

Section 3.1.4: In order to properly characterize the site, the scope of this section needs to be expanded to include terrestrial habitats. Additionally, strike the words along creek banks and floodplain in last two bullets.

Section 3.2: See General Comment 2.

IBID.: In the section dealing with Benthic macroinvertebrates, a bullet states that invertebrates provide food for bottom feeding fish species. Add insectivorous birds, and waterfowl.

Section 4.1: This section should be expanded to include insectivorous birds, and terrestrial

receptors such as vermivorous wildlife, and non-piscivorous raptors.

Section 5.1.1 Sediments: Sediment samples were taken from a depth of 0 to 2 inches. With a site with such a long history of release, the true contaminant sources may be buried to a level much deeper than this by relatively clean sediments through normal depositional loading. If in the future a large scour event, or dredging were to remove this top layer a large source of contamination may be exposed. In a ERA, the site should be fully characterized, and the depth of contamination should be fully known in order to make a proper risk management decision.

Soil: Soil samples were limited to 0-6 inches. At a site with a long history of release, the true contaminant load may be buried to a level much deeper than this by relatively clean sediments during flood events and other depositional activities. In an ERA, the site should be properly characterized, and as a part of this characterization, the depth of contamination should be fully explored and investigated in order to make a proper risk management decision. Additionally, soil invertebrates, and burrowing mammals normally encounter soils at a deeper than this. Ecological soil samples generally are taken at a depth of two feet.

Figure 5-3: Risk has not been properly characterized at sites G, H, I, or L as no soil samples were taken these sites.

Section 7.1.1: The ecological risks for Dead Creek Segment F have not been completely characterized. A food chain transfer model should be constructed to characterize risks to wildlife that forage on aquatic life produced in Segment F. Although fish or benthic macroinvertebrates were not collected from Segment F, one could use the sediment/water concentrations multiplied by a Bioaccumulation Factor (BAF) to calculate expected fish/invert residues and exposure to wildlife.

Section 7.1.3.2: The ERA states that impairment of the benthic community is most likely due to the poor habitat in the sampled locations. No historical data appears to have been consulted in making this determination. The more sensitive macroinvertebrates may have died off from chemical contamination over the many years that the creek was polluted.

MIKE HENRY <MHENRY@dnrmail.state.il.us> on 01/26/2001 02:42:11 PM

To: Mcateer.Michael cc: candy morin , Kevin de la Bruere
Subject: Re: Sauget

Mike et al,

My apologizes for not getting back to you sooner. Dr. Stoeckel (Denise), our toxicologist who would otherwise be engaged in reviewing the Area 1 ERA has resigned to pursue motherhood as her new career. While we will miss her expertise tremendously ... this is indeed a joyous event and we wish her the very best.

We are still engaged in Sauget issues. Unfortunately, the recent events mean no formal technical comments will be submitted at this time on the ERA for Area 1. (I do have some "observations" based on a cursory review for your consideration, but understand I am not formally trained in risk assessment.). While we scramble to hire a new toxicologist, we will be looking at using one of our contractors to fill this void in the interim.

Observations:

1. This document acknowledges area toxicity to avian species yet seems to say "it' not from Monsanto/Solutia because no samples were taken from the BP Lake in the FWS study of Allorton so it can't be us, and birds eat all over the place so they are not likely to cohabit at very long at the site...so the risk is nil". This is the theme for the entire report ...

Here you have at least 4 known T&E avian species observed at the lake, but summarily dismiss risk because (essentially) contamination is "everywhere, but not ours" and bald eagles "aren't around much so little exposure risk is present". I find this logic/approach flawed and the question of what is the direct risk from the lake is never addressed. With ERA you are using existing data, then trying to model the risk by bounding the uncertainties...

Specifically, with the avian issue, the problem formulation step would appear more appropriate to bound any uncertainty associated with the lake by assuming receptors (in this case piscivorus) obtain 100% of their food from the contaminated area with 100% bioavailability. Rather than making broad brushed assumptions dismissing possible risk.

2. Sediment samples - I may have missed this, but I thought the data was taken from depths of 0-2". If so, I am not sure this is a true metric of potential historic contamination. Specifically, I would think 0-2" would only be telling of recent depositional loadings and not what's truly adsorbed over time onto the creek/lake bottom. We have used our researchers at the ISGS to conduct sediment dating exercises in the past, I am curious if this would be of any utility here...

3. Is there any historic information on the creek for biota ? The report at times implies since nothing is there...there's no risk. Local communities and

Sgtl - DNR - riskcomments

populations may have been present in the past...until contaminations (e.g. zinc) changed things... in theory. Again, I find this logic flawed.

4. Assessment Endpoint - As I understand, by definition AE's are an explicit expression of the environmental value that is to be protected. I keep going back to the T&E species known to be at the lake. I am unclear why they were not given higher consideration when identifying assessment/measurement endpoints. Granted they look at the Bald Eagle...but they make it clear that they used direct observation and "no bald 's nest..and they only hang out couple of months at best"...factoring this in..."no risk". Remedial actions , as I understand, do not focus on protecting organisms unless they are designated as protected status species...which we have in this case several at the site and within the local ecosystem.

5. I use a "cheat sheet" when ever I look at ERA's. Specifically, I keep a copy of OSWER Directive 9285.7-28P (Issuance of Final Guidance: ERA and RM Principles for Superfund Sites), dated Oct. 7, 1999 in front of me to make me "dangerous" at best.

Accordingly, one question comes to mind when I read the Directive and compare it to the ERA at Area 1. Specifically, a goal of the ERA is to present a characterization of site risks to the ecosystem that are transparent to the public. As such, how does assessing part of CS F, and borrow pit lake extrapolate to the remainder of Site 1 and the local biota population/community?

6. Finally, I am not familiar with the USEPA preliminary risk work referenced which is being used to supplant the first two steps of the ERA in this document. I would be helpful to the reader if a brief overview of the past work were given and an explanation as to why it is sufficent for Steps 1 and 2 of the Superfund ERA process.

I appreciate being kept in the loop and would be very interested in seeing what your technical ERA folks have to say....

Regards,

Michael L. Henry, CHMM
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>>> <Mcateer.Michael@epamail.epa.gov> 01/09/01 01:54PM >>>
Hi Candy, Kevin and Mike:

Happy New Year!