UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

MAR 19 1992

David Adler
Former Sites Restoration Division
Department of Energy,
Oak Ridge Operations Office
P.O. Box 2001
Oak Ridge, TN 37831-8723

Dear Mr. Adler:

We have completed our review of the draft Baseline Risk Assessment (Assessment) for the St. Louis Site in Missouri. Our comments are divided into two major components: 1) comments on the human health risk assessment, and 2) comments on the ecological risk assessment, primarily from Chapter 6. Following are our comments:

HUMAN HEALTH RISK ASSESSMENT

1. The Assessment does not address ingrowth of radium-226 from decay of the abundant thorium-230 on site. Radium-226 is present throughout much of the St. Louis site at levels far below the concentrations that would reflect secular-equilibrium with the parent thorium-230. Consequently, the concentrations of radium-226 will increase as time passes, as will the release of radon-222 from the decay of radium-226. While the currently existing ratios of Th-230 to Ra-226 are somewhat uncertain, the ingrowth of radium-226 for a given ratio is highly predictable. If the ratio is 100, the radium-226 concentration will increase nearly 10-fold in 200 years, 36-fold in 1000 years. The radon generation levels will increase in proportion to the radium-226 concentration. Thus, in the "future" time frame normally considered for a CERCLA site, the no-action scenario would involve a complex process of increasing radon generation and release. At a minimum, the Assessment should recognize that the radium ingrowth question would have to be dealt with in any case where it is proposed to leave contamination in place.

2. Exposure point calculations were reported to be calculated as 95% upper confidence limit (UL_{95}) values of the arithmetic means for the measured radionuclides at each property (for radiation) and UL_{95} values of arithmetic means for chemical contaminants. However, the draft Assessment does not show the

actual data used in the calculation or the method used to calculate the UL_{95}. Data presentations (tables in Section 2) may show a range and a mean, but do not permit following the actual calculation that was made. Both the data and the method of determining the UL_{95} should be provided.

3. Data for 17 separate SLDS buildings were combined into one data set, and a UL95 value for that data set was used to arrive at an exposure point concentration for radon exposure in buildings at the SLDS. Combining all the radon data (except for building K1E) to arrive at a single radon exposure point concentration is questionable. Radon concentration measurements for each building are representative of a concentration for each building, which is distinct from all the other buildings. The values for one building are not measurements of the same quantity as are radon measurements in other buildings. Further, there is no reason to believe a worker exists whose exposure time is divided equally among the 17 buildings for which data are included in the UL_{95} calculation. Assuming workers at the SLDS follow a usual pattern of working all day in one building, the associated risks can be calculated only by use of a value (e.g., UL_{95}) determined for that particular building from all of the data for that particular building. Similar treatment of building K1E would permit determination of a UL_{95} value for radon concentration in that building, which could then be used to estimate risks based on time that may actually be spent in that building by workers at the SLDS.

4. Table 2-16 lists those chemical contaminants reportedly deleted from the Assessment. Yet several of those contaminants are listed in Table 7.1 as contaminants of concern. Clarification is needed. If DOE plans to delete any contaminants addressed in the draft Assessment from the draft final Assessment, EPA should be contacted beforehand.

5. As described in Subsection 3.3.1.3, Exposure Point Concentrations for the Inhalation of Particulates, the draft Assessment estimates dose from inhalation of both chemical contaminants and radionuclides in airborne dusts. The approach used was to adopt a value of 0.08 mg soil (30% respirable) per cubic meter of air, from historical data on airborne dust concentrations in St. Louis. This dust was then assumed to contain the contaminants of interest at the same (UL_{95}) concentrations as those found in soil on the site. The resulting dose estimate is not a dominant portion of the total estimated dose for any receptor, but can be significant in terms of overall CERCLA goals. For example, the radionuclide carcinogenic risk from this source for the SLAPS/HISS maintenance worker is greater than 2×10^{-4}. This method of estimating dose from inhaled particulate may yield an

estimating dose from inhaled particulate may yield an overestimate. This is because the particulates measured in urban air do not come primarily from the soil on the plot of ground where the concentration is measured. DOE should investigate whether some of the modeling methods referenced in EPA risk assessment guidance can yield more reasonable estimates of exposure by this route.

6. Subsection 3.3.2.2 deals with Exposure Point Concentrations for the Inhalation of Contaminants from Groundwater. The second paragraph states that, "Exposure to radon gas via inhalation from groundwater was not assessed because exposure to radon is primarily the result of the migration of radon from soil into homes. In addition, concentrations of radium-226 in groundwater were low so that the contribution from this source would be small compared with the contribution from soil (Table 3.20)." Neither of these statements is supported in the Assessment, and neither is a valid reason for not dealing with radon exposure in a shower using ground water. Radon concentrations in ground water do not result primarily from radium-226 dissolved in the ground water, but rather from radium-226 in the soil. In some locations where high levels of radon in soil prevail, ground water use is recognized as an important contributor to the radon levels within a home where ground water wells provide household water. The State of Maine, for example, recommends remedial action for ground water radon concentrations exceeding 10,000 pCi/L. Concentrations well over 100,000 pCi/L are seen in Maine ground water, not accompanied by similar levels of dissolved radium. In the implementation of those recommendations, the groundwater radon concentration is seen to have a major effect on the house air radon concentrations. This issue may be difficult to address, in that there appears to be no information on ground water radon concentrations at the St. Louis Site. However, the Assessment needs to deal with the issue in a credible manner.

7. Contamination that may have been transported via ground water or surface water into the Mississippi River has not been assessed, and is deemed insignificant (Subsection 3.2.2) for two reasons: (1) contaminants in water would be diluted to insignificance, and (2) if detectable contamination exists in Mississippi River sediments adjacent to the site, there would be no exposure to these sediments because the river near the SLDS is deep and relatively fast flowing and is not used for swimming or wading. However, this discussion is silent on the question of fishing, although the draft Assessment elsewhere (page 3-12) recognizes the possibility of accessing the Mississippi River at this point for fishing. The Assessment should deal with the potential for exposure via catching and consumption of bottom feeding fish, which will be of concern to the public.

8. In Subsection 3.3.2.2, Exposure Point Concentrations for the Inhalation of Contaminants from Groundwater, third paragraph (page 3-22), it was assumed that 50L (roughly 13 gallons) of water would be used per shower. According to the U.S. EPA Exposure Factors Handbook 1989 (EPA/600/8-89/043), the median shower duration is approximately 7 minutes and the 90th percentile is 12 minutes. In addition, shower flow rates may range from 5 to 15 gallons per minute. Therefore, the amount of water used per shower would be more in the range of approximately 130 gallons per shower, rather than 13 gallons. Further, the assumption that 50% of the contaminant will volatilize is inconsistent with Henry's Law calculations for many volatile organics of low solubility, which indicate that nearly all will volatilize. Clarification is needed.

9. We disagree with the deletion of ingestion as a pathway for residents of the vicinity properties. It seems possible that children might play and gardens might be grown in contaminated areas, even if those areas are near the roadways. This pathway needs to be more fully addressed in accordance with EPA guidance, and support of any assumptions used provided.

10. Carcinogen slope values for benzo(a)pyrene are listed in the HEAST, Annual FY-1991. However, the Superfund Public Health Evaluation Manual (SPHEM, 1986) is cited as the source for benzo(a)pyrene toxicity values in Section 4.2.2.2, Chemicals for Which No EPA Toxicity Values Are Available (page 4-13). It is inappropriate to utilize toxicity values listed in the SPHEM because a number of the toxicity values in this publication have changed since 1986. Rather, the U.S. EPA Environmental Criteria and Assessment Office, Superfund Health Risk Technical Support Center in Cincinnati, Ohio, should be consulted for current guidance in instances where toxicity values are unavailable for a particular chemical of concern.

    In addition, Table 4.1, which lists toxicity values for the chemicals of concern, cites the HEAST from 1990 as an information source. The most current HEAST available was published in January 1991 [OERR 9200.6-303(91-1), Annual FY-91]. The most recent version of the HEAST should be used to determine toxicity values for use in the Assessment.

11. The most recent version of the Lead Uptake/Biokinetic Model was prepared by the U.S. EPA in January 1991 ("Technical Support Document on Lead," and the associated Program disk and "Users Guide for Lead: A PC Software Application of the Uptake/Biokinetic Model, Version 0.5, " January 1991). The specific site-specific parameter values employed in the uptake/biokinetic modelling for the current and future use scenarios described in Sections 5.2.1 and 5.2.2, respectively, should be provided.

12. The risk characterization results for the future use scenario are not presented in a manner which is consistent with that of the current use scenario results. The numerical risks calculated for the various receptors are not stated or summarized in the text. The text merely states that the risks are " . . . greater than the target range . . ." in Subsection 5.2.2, Hypothetical Future Site Use (page 5-10). The results should be clearly summarized such that the reader will be able to easily determine the relative magnitude of the risks compared to the target risk range.

13. In Table 2.10, several instances are noted where mean values are listed for substances whose detection frequency was zero. Footnote "a" to that table provides the only clue to the possible meaning of such a mean value; it appears that the "mean" listed is a mean calculated from each non-detect sample, using a limit-of-detection value. However, the substances with "0" detection frequency include sodium and potassium, for which mean values are listed that are far below the background levels listed in the same table. The result is a confusing picture, which should be clarified.

14. Subsection 3.3.2.2, page 3-22, discusses exposure point concentrations for the Inhalation of Contaminants from Groundwater. The subsection states that exposure was only assessed for volatile organic compounds with molecular weights greater than 200. It appears that the authors must really have intended this sentence to read " . . . molecular weights less than 200 . . .". Correct?

15. Subsection 3.4.1.1, pages 3-26, 3-27, discusses exposure time, frequency, and duration. The current and future residential scenarios assume an exposure duration of 30 years. However, the child commuter (waiting for school bus) is only assumed to be exposed for 9 years. It seems possible that a child would commute to both elementary and high school for a total duration of 12 years.

16. Subsection 3.4.1.3, page 3-28, discussing ingestion rates, proposes a factor of 0.4 to account for the percentage of outdoor dust transported indoors. This factor is unsupported in the text. The Assessment should state the derivation of the value.

17. Table 3.24, page 3-77, 3-78, gives the exposure frequency for the SLAPS/HISS maintenance worker as 200 days per year. Elsewhere it is explained that this 200 days represents a summation of days required for maintenance at HISS and days required for maintenance at SLAPS. However, the normal work year is 250 days. It should be explained whether this person is away from the site on the remaining 50 work days.

18. Subsection 3.4.2.5 and 3.3.1.4 discuss exposure from ingestion of home-grown produce. Tables 5.22 and 5.23 (pages 5-43, 5-44) present the estimated risks from this source. The doses were calculated on the basis of soil-to-plant transfer factors, which were developed primarily for assessing the maximum exposures that might occur from weapons testing fallout. Does DOE have any additional information which would further support the validity of the approach used, e.g., have the soil-to-plant transfer factors given in Table 3.17 ever been used together with known soil concentrations to calculate levels of toxic metals in food crops?

19. Table 4.2, on pages 4-10 and 4-11, lists a footnote "d" for the benzo(a)pyrene slope factor listing. No footnote "d" is found along with footnotes "a" through "c". In addition, the exponent for the slope factor units is missing, i.e., "$(mg/kg-d)^{-1}$", not "(mg/kg-d)"

20. Table 2.14, Grouping of Radionuclides. Under "Associated Decay Products of Radium-226," "Plutonium-218" should be "Polonium-218."

21. A concentration-toxicity screening for selection of chemicals of concern is described on page 2-25, and referenced repeatedly in Table 2.16, Chemical Contaminants in Soil and Sediment Deleted from the Risk Assessment, as rationale for elimination of many contaminants. However, tables detailing the toxicity values utilized in the screening, sources for the toxicity values [i.e., the Integrated Risk Information System (IRIS) or the Health Effects Assessment Summary Tables (HEAST)], and the results of the concentration times toxicity calculations are not provided in the draft Assessment. Such information should be included.

    Further, the last paragraph in Section 2.5.2 (bottom of page 2-25) states that toxicity values were unavailable for some of the compounds. However, according to the HEAST [U.S. EPA OERR 9200.6-303 (91-1), January 1991], toxicity values [reference doses (RfDs) and cancer slope factors (CSFs)] are available for some of these compounds, as follows:

Chemical	Toxicity Value
Acrylonitrile	Oral CSF = 5.4E-1 $(mg/kg/day)^{-1}$ Inhalation CSF = 2.4E-1 $(mg/kg/day)^{-1}$
2-Butanone	Oral RfD = 8.0E-2 mg/kg/day oral for chronic and subchronic endpoints for methyl ethyl ketone.
Chloroethane	Inhalation RfD = 1E+1 mg/m^3 for chronic and subchronic endpoints for ethyl chloride
4-methylphenol	Oral RfD = 5.0E-2 mg/kg/day for chronic endpoints and 5.0E-1 for subchronic endpoints for p-cresol.

In Table 2-16 (page 2-57) which details the rationale for eliminating chemicals from further consideration in the Assessment, the reason for deleting chemicals which do not have appropriate toxicity values (for example, acenaphthylene, benzo(g,h,i)perylene) is attributed to insignificant contribution to the overall risks based on the toxicity-concentration screen. However, these chemicals could not be evaluated quantitatively in the toxicity-concentration screen. The rationale for deletion should be reworded to state that such chemicals could not be evaluated in the toxicity-concentration screen.

22. In Section 2.4.4, Comparison of Site Contaminant Levels with Regulatory Standards, available criteria, standards and/or regulations pertinent to the sampled environmental media are described. Federal Ambient Water Quality Criteria (FAWQC) for the protection of aquatic organisms are requirements which could be utilized for comparison with the surface water data from Coldwater Creek.

23. U.S. EPA "Guidance for Data Usability in Risk Assessment" (EPA/540/G-90/008, OSWER Directive 9285.7-05, October 1990) should be cited in Section 2.5, DATA EVALUATION, as a resource for the evaluation of data for use in the draft Assessment.

24. Dermal exposure to chemicals in soil and water is not addressed in a quantitative manner in the draft Assessment. However, this is in contrast to the U.S. EPA guidance (U.S. EPA Human Health Evaluation Manual, 1989, and U.S. EPA Interim Guidance for Dermal Exposure Assessment, OHEA-E-367, March 1991), which state that dermal exposure can and should be evaluated quantitatively. Calculated dermal absorbed

doses are compared to adjusted oral toxicity values (administered oral doses which have been converted to absorbed doses).

Carcinogenic PAHs are not typically evaluated with respect to risks associated with dermal contact because these compounds cause skin cancer through a direct action at the point of application. Therefore, it would be inappropriate to employ an adjusted oral slope factor in the case of carcinogenic PAHs. In other cases, however, the Assessment should deal with chemical exposure through dermal absorption.

ECOLOGICAL RISK ASSESSMENT (Chapter 6)

25. It appears that DOE either has not researched regional literature or has not applied that information to the ecological risk assessment. Our comments assume that on-site ecological sampling and analysis are not necessary at this time, but may be, depending upon literature-derived data to be obtained.

26. As described in RAGS II there are generally five sections that are included in an ecological risk assessment: Hazard Identification, Receptor Characterization and Endpoints, Stress-Response Assessment, Exposure Assessment, and Risk Characterization. A more complete treatment of these sections, in accordance with EPA guidance, is needed. At a minimum, DOE needs to research available literature to determine how much information already exists and apply that information to the ecological risk assessment.

27. Because DOE apparently has not conducted any on-site ecological surveys or investigation, the 1987 Corps of Engineers (COE) report cited in the references was reviewed as a source for site and vicinity biota information. Using the COE report as a starting point, we believe the following improvements to Chapter 6 of the Assessment need to be made:

    a) The COE study is nearly six years old. The state of ecological conditions may have changed significantly over that period of time. Whether or not a significant change in ecological conditions has occurred needs to be verified.

    b) The study states that there are small lakes and ponds in the vicinity of Coldwater Creek. These are not discussed or described in the draft Assessment. The Assessment should state whether there are any small

lakes or ponds on the DOE properties. In addition, any small lakes or ponds situated in an area that would be impacted by contaminants from the DOE properties should be noted.

c) Many areas of potentially important biota habitats are listed in the COE report:

- Urban area with some (or significant) vegetation - 2,000 acres.
- Forest (deciduous) - 1,118 acres.
- Forest (coniferous) - 17 acres.
- Open space with scrub-scattered trees - 800 acres.
- Open space with only grasses - old fields - 919 acres.

The size, location, importance and potential impact to these areas are not discussed in the draft Assessment. The Assessment should identify whether any of these biota habitats exist on the DOE properties or whether any such habitats are situated in an area which would be influenced by contaminants from the DOE properties.

d) The COE report lists 65 acres of wetlands in the vicinity of Coldwater Creek. The type, location and quality are not discussed. The assessment of wetlands in the report was conducted before current wetland regulatory guidance and assessment manuals were developed. Therefore, wetland determinations on the DOE properties should be performed using current guidelines. Also, the presence and type of wetlands in the vicinity of the DOE properties should be obtained from National Wetland Inventory maps. Any wetlands situated in areas which could be influenced by contaminants from the DOE properties should be included also.

e) The COE report recommends that site-specific investigations be performed for threatened and endangered (T&E) and other state-listed sensitive species. The draft Assessment does not discuss state-listed species. At a minimum, information on T&E species should be obtained from the Missouri Department of Conservation, Natural Heritage Inventory program.

f) The COE report states that 19 benthos taxa and 6 fish taxa were located in the survey of Coldwater Creek. This does not agree with the number reported in the draft Assessment. The Assessment should state how the benthos and fish toxic data were determined. Additionally, taxa found are presented in tables in the COE report. These tables and taxa are not presented in

the draft Assessment. The number of individuals of some species was presented, but the numbers were not discussed in the draft Assessment.

g) The report states that Coldwater Creek has low species diversity, but that high numbers of those taxa are present. The draft Assessment does not state this. Instead, it leads the reader to believe there is low diversity and low numbers of those taxa present. The Assessment should state how the determination of low diversity and low numbers was made for the ecological risk assessment.

h) The COE report lists trees, shrubs, mammals, birds, reptiles and amphibians as being present at Coldwater Creek. The list is much longer and is not in agreement with those listed in the draft Assessment. The Assessment needs to incorporate the names of the additional species present as identified by the Corps and to provide a discussion of how species that do not appear in the 1987 Corps report were identified for the draft Assessment.

i) The COE report states that the area downstream of the site is more natural and rural, with more wildlife habitat present. A discussion of potential impacts to these areas by site releases is warranted.

28. Because a metal is essential to humans is not a reason to assume it would not pose a threat to ecological systems. Though the metals mentioned may not be a human risk until higher concentrations are attained, they may be toxic or stressful to biota at current levels. The Assessment should address this issue.

29. The toxicity screening of contaminants appears to be based on human toxicity only. Screening for ecological toxicity should be addressed.

30. Factors used to determine potential human exposure pathways are provided, but factors for ecological pathways are not.

31. The contaminants of concern are not defined within Section 6 but should be.

32. The conclusions presented in paragraph 2 on page 6-5 are not supported by data. For example, justification for conclusions regarding the terms "extremely low biota diversity", dominant invertebrates, invertebrates present, "limited populations", fish present and level of concentration are not substantiated in the text. The supporting information should be provided. Also, paragraph

3 on the same page would benefit from expansion. It appears that the information contained in the report by Peterson and Girling may be of more importance to the site than is indicated by the short discussion here. Finally, in paragraph 4 of page 6-5 please explain exactly what is meant by the term "ecologically vital groundwaters".

33. Appendix B should be reviewed to ensure that information presented on the contaminants of concern includes information of ecological importance. For example, BCFs should be presented, and there is no discussion of impacts to biota from cadmium, copper, and chromium. Where site concentrations of contaminants are in the range of possible ecological impacts (e.g., thallium), analysis and clarification is warranted.

Should you have any questions regarding our review, please do not hesitate to contact me at FTS 276-7709.

Sincerely yours,

Gregory D. McCabe
Site Assessment and Federal
Facilities Section
Superfund Branch

cc: David Bedan, MDNR

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JOHN ASHCROFT
Governor

TRACY MEHAN III
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
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Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Division of Parks, Recreation, and Historic Preservation

March 16, 1992

Mr. David Adler
St. Louis FUSRAP Site Manager
Former Sites Restoration Division
U. S. Department of Energy
Oak Ridge Operations, P.O. Box 2001
Oak Ridge, Tennessee 37831-8723

Dear Mr. Adler,

The Missouri Department of Natural Resources (MDNR) has reviewed the draft Baseline Risk Assessment (BRA) for Exposure to Contaminants at the St. Louis Site, St. Louis, Missouri, U.S. Department of Energy, (DOE) Oak Ridge Operations Office, Formerly Utilized Sites Remedial Action Program (FUSRAP) December, 1991.

GENERAL COMMENTS

Both the Environmental Protection Agency (EPA) and the MDNR have previously made comments on characterization issues in the draft remedial investigation report. Some of these comments remain to be resolved. Resolution of these comments may impact the conclusions in the BRA.

SPECIFIC COMMENTS

Pages 1-15 to 16, Section 1.3.1, Time Period: Why was the time of 50 years chosen as the length of the no action alternative? Although DOE has stated an intention to conduct a cleanup it is not within DOE's authority to guarantee that a cleanup will occur within 50 years. How would the BRA be different if a longer period were chosen? e.g., 70, 100, 500, 1000 years? The 50 year period does not consider the possibility of the loss of institutional control or of the continuing spread of contaminants, particularly on property not controlled by DOE.

Page 2-3, Section 2.2, Data Collection: What are the metals and background levels referenced here? What is the rationale for using this data as background? Does DOE intend to collect local background samples for metals?

Page 2-4, Section 2.2.2.1, Soil: When, and by what process, will a residual uranium guideline for the St. Louis Site be established? See comment on section 5.1.

Pages 2-12 to 2-18, Section 2.3, Radiological Characterization Results: This discussion should include maximum contamination values; more page references to the summary tables would be helpful to the reader.

Page 2-16, Section 2.3.2, Groundwater: What are the uranium isotope ratios in groundwater for these sites? Do you have field data showing that the uranium isotopes in groundwater are in fact in natural ratios?

Page 2-16, Section 2.3.3, Surface Water and Sediment: This section states that sediment samples from Coldwater Creek downstream of SLAPS contain radionuclides at concentration levels consistent with background levels. This contradicts the data in Table 2.3 on page 2-41 which indicates thorium-230 concentrations up to 5,100 pCi/l in Coldwater Creek sediments. Please explain this apparent discrepancy.

Page 2-17, Section 2.3.4, Air, This section states that external gamma levels at SLAPS have remained consistent since 1984. What are these levels? Are they consistently high or low? How do they compare to background and DOE standards? What are the external gamma levels at the HISS?

Page 2-20, Section 2.4.4 Comparison of Site Contaminant Levels with Regulatory Standards: This section states that the high detection limit for lead (100ug/L) makes it impossible to determine whether the concentration of lead is less than the MCL of 50 ug/L (also, Table 2.13 on page 2-54 is incorrect). I understand that the MCL for lead (now called an "action level") is 15 ug/L. The data on lead is inadequate for determining compliance with regulatory standards. Are there any plans to do more sampling for lead at lower detection level?

Pages 2-23 to 26, Section 2.5.2, Chemical Data: In comments on the characterization of metals in the RI report both EPA and MDNR have questioned the adequacy of sampling for metals. This section may need to be revised if additional information on metals is obtained.

Page 3-11, Section 3.2.3, Exposure Points, Receptors and Exposure Routes: The lack of data on dermal absorption is especially of concern for several receptors, e.g., a child in Coldwater Creek, the vegetable gardener, and the SLDS or the SLAPS/HISS construction worker. The current SLDS or the SLAPS/HISS construction worker may be in more prolonged and direct contact with contaminated soil, e.g., while digging or working in a ditch, than the SLDS or SLAPS/HISS maintenance worker.

Page 3-12, Section 3.2.3, Exposure Points, Receptors and Exposure Routes: Another possible receptor of concern is the current frequent (e.g., 3-6 times a week x 30 minutes = 1.5 to 3.0 hours/week) jogger or walker along the haul roads.

Page 3-44, Table 3.1, Property Groups and Corresponding Receptors Assumed for Current and Future Land Uses at the St. Louis Site: See comments on pages 3-11 and 3-12 above.

Pages 5-1 to 5-4, Section 5.1, Risk Characterization Methodology: Since the chemical toxicity of uranium may be the limiting factor for this element, how will this be used in the risk estimates and setting residual uranium guidelines for the St. Louis Site?

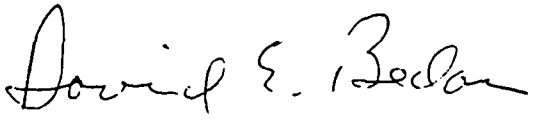
Page 5-4, Section 5.1.2.2, Hazard Quotients and Hazard Indexes: This section states that model for evaluating lead levels assumes the lead uptake from water to be 1 ug/day. Does this assume a 0.25 liter/day water ingestion rate? What guidance is this based on?

Page 7-10, Section 7.5.1, Risk Estimates for Current Site Use: See comments above on section 3.2.3 regarding the need to include the current SLAPS/HISS construction worker and the current haul road jogger or walker.

Also attached are additional comments from the Division of Geology and Land Survey and the Missouri Department of Health.

Sincerely yours,

DIVISION OF ENVIRONMENTAL QUALITY



David E. Bedan
Radioactive Waste Cleanup Coordinator

Document: FUSRACOM

attachments

cc: Ron Kucera
John Young
Mimi Garstang
Nick DiPasquale
Daryl Roberts
Greg McCabe, EPA Region VII

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Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Divisionof Parks, Recreation, and Historic Preservation

MEMORANDUM

DATE: February 11, 1992

TO: Dave Bedan, Radioactive Waste Coordinator, DEQ

FROM: Mimi Garstang, Environmental Geology Section, DGLS

SUBJECT: Baseline Risk Assessment for Exposure to Contaminants at the St. Louis Site; St. Louis, Missouri

LOCATION: N 1/2, Sec. 4, T. 46 N., R. 6 E. and
S 1/2, Sec. 33, T. 47 N., R. 6 E., Florissant Quadrangle.

The above mentioned document has been reviewed by DGLS. Specific comments relative to the geological and hydrological issues at the site are listed below.

1. P. 2-5, 2.2.2.2 Groundwater - It is mentioned that a canvas identified 8 wells within a 3 mile radius of SLAPS and HISS. None are being used for drinking water, but obviously are producing from an aquifer. Some indication of the source of this water may help clarify our definition of the uppermost aquifer in the area. We will be especially interested if any produce from Coldwater Creek alluvium.

From the discussion on groundwter monitoring wells, it sounds as if the wells at the SLDS were only monitored for four quarters; however continual monitoring occurs at HISS and SLAPS. We highly recommend sampling and monitoring of wells over a several year period to get the best understanding of contamination and groundwater migration at a site. This data should be included for review.

2. P. 3-2, 3.1.1.3 Geology & Stratigraphy - Our office does not recognize the word "fluvium". Perhaps a definition of this material could be provided or substitute "alluvium" to describe major river deposits.

The St. Louis area is not considered tectonically quiet. The New Madrid seismic zone creates earthquakes on a regular basis and many are felt in St. Louis. Thick sequences of unconsolidated material, such as those existing at all the St. Louis sites, will be especially susceptible to tectonic movement.

3. P. 3-3, 3.1.1.3 Geology & Stratigraphy - The "undifferentiated rocks" referred to in the bedrock description beneath the SLAPS site may be better described as cyclothem deposits or alternating thin sand, shale and limestone beds that are Pennsylvanian in age and most likely of the Cherokee Group.

Most of the sites and most of the St. Louis area is underlain by

Mississippian age limestones that are not considered to be relatively impermeable. Sinkholes, and other secondary permeability features as well as karst topography are common to these limestones. The bedrock yields to wells are significant; however, the primary reason the aquifer is not potable is due to poor water quality.

MG/dsb

Missouri Department of HEALTH

MEMO

To: Dave Bedan
Radioactive Waste Site Coordinator
Department of Natural Resources

From: Daryl W. Roberts
Chief
Bureau of Environmental Epidemiology

Subject: FUSRAP BRA Comments

Date: March 13, 1992

Attached please find additional comments from our quantitative risk assessment program utilizing EPA guidance methodologies. These comments are submitted in addition to our previous comments of Februrary 12, 1992.

If you have any further questions or concerns, please feel free to contact me at your convenience at 751-6102.

DWR:GMC:pw

Comments on the
Draft Baseline Risk Assessment,
St Louis FUSRAP Site, St. Louis, MO

General Comment

The format used for tables in this document was frequently difficult to follow. The placement of numerous tables at the end of each section without page number references in the text made the document extremely unwieldy to the reader. A few simple format changes in the document would make it more useful to the reader.

Specific Comments

1. Page 1-7, section 1.2.1.1, fifth paragraph. The first sentence is awkward. Please reword for clarity.

2. Page 1-14, section 1.3. The baseline risk assessment evaluates potential risks to human health and the environment from *all* contaminants present at a site, regardless of their origin.

3. Page 1-16, section 1.3.2. Institutional controls are not considered in a baseline risk assessment.

4. Page 2-3, section 2.2, second paragraph. Weldon Springs may not be the most appropriate location to measure background levels of inorganic compounds. Additionally, it was not clear if the levels used for background in the Weldon Springs documents were specific to the state of Missouri or if they were national averages.

5. Page 2-13, section 2.3.1.1, last paragraph in the section. Was any sediment or surface water sampling conducted on the Mississippi River adjacent to the city property? It would be reasonable to assume that if contamination was widespread on the city property, it may have migrated to the river (a potential environmental risk).

6. Page 2-19, section 2.4.1, second paragraph. Without positive identifications of tentatively identified compounds (TICs), how can the risk from exposure to these compounds be estimated? If the risk cannot be estimated, it cannot be deemed insignificant. A better approach may be to discuss risks from TICs in the uncertainty section.

7. Pages 2-25 to 2-26, section 2.5.2. Lead can be evaluated using the lead Biokinetic Uptake model and there is an oral RfD for 2-butanone (methyl ethyl ketone) listed in the Health Effects Summary Tables.

8. Page 3-10, section 3.2.2. first paragraph. Although there may be no human exposure to Mississippi River sediments, fish and other river biota are exposed to these sediments.

9. Page 3-10 to 3-13, section 3.2.3. There are two additional exposure scenarios which may warrant consideration in this risk assessment. One scenario would be recreational, such as a jogger, who is exposed to external gamma radiation for a period of time on a daily basis (1 hour/ day, 5 days/week). A second scenario would be industrial, such as a construction worker, who is exposed for a limited period (10 hours/day for a 3-4 week period) of time to radiation and chemicals in subsurface soils.

10. Page 3-15, section 3.3.1.1, under Chemical Data. With highly skewed data from only six sampling points, maximum contaminant concentrations should be used to estimate intake instead of central tendency measurements.

11. Page 4-13 and Table 4-2. Rather than citing the outdated Superfund Public Health Evaluation Manual, either the Risk Assessment Forum or the Environmental Criteria and Assessment Office should be cited as a source for the slope factor for benzo(a)pyrene.

Missouri Department of HEALTH

MEMO

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for Chief
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RECEIVED
FEB 18 1992
DEQ ADMIN

DATE: February 11, 1992

SUBJECT: Draft BRA for St. Louis FUSRAP Site

We have reviewed the subject document and from the results of the Human Health Risk Assessments presented in this document, the St. Louis site presents a certain degree of risk to the public.

Under present use conditions, the risk will be limited primarily to the persons involved directly with the site, like maintenance workers and employees. For these individuals, measures should be taken to protect them from exposure during their regular work activities. The risks to the general public are expected to be minimal as all the most hazardous areas are adequately secured to prevent access by the general public.

Future use of the sites and the vicinity properties for residential, commercial, or recreational purposes in the absence of remediation, is unsatisfactory from the standpoint of human health. In order to release these areas for unrestricted use they must be cleaned up so that contaminant levels are below those established by the EPA for radionuclides. Chemical contamination at the St. Louis sites is minimal compared to the radionuclides. Attached is a list of the chemical contaminants of concern (from page 7.7) which shows figures that can be used as cleanup guidelines.

If you have any questions on these comments, please contact Dick Gnaedinger at 751-6102.

DWR:RG:je

CONTAMINANT	HIGHEST LEVEL FOUND AT THE SITE (PPM) WATER	SOIL	OTHER	RECOMMENDED ANY USE LEVEL (PPM) WATER	SOIL	HEALTH EFFECTS POSSIBLE AT CONCENTRATIONS ABOVE THE RECOMMENDED LEVEL
ANTIMONY	-	-	-	.01	23	NAUSEA; HEADACHE; SLEEPLESSNESS; LOSS OF APPETITE; DIZZINESS; LIVER AND KIDNEY DEGENERATION.
ARSENIC	-	-	-	.05	11	KNOWN HUMAN CARCINOGEN; GI DISTURBANCES; PERIPHERAL NEURITIS; SKIN, HAIR, DAMAGE.
BARIUM	-	-	-	2.0	3938	CNS DEPRESSENT; HAEART ARRHYTHMIAS; ABNORMAL MUSCLE FUNCTION.
BERYLLIUM	-	-	-	.001	1.2	ANIMAN CARCINOGEN; PROBABLE HUMAN CARCINOGEN.
BORON	-	-	-	ND	ND	ND
CADMIUM	-	-	-	.005	28	ATTACKS KIDNEY, PROSTATE; POSSIBLE CARCINOGEN; LIVER CIRRHOSIS.
CHROMIUM TOTAL	-	-	-	.1	281	LIVER, KIDNEY DAMAGE; IRRITANT TO SKIN, EYES, NOSE, THROAT.
CHROMIUM III	-	-	-	.1	56250	
CHROMIUM VI	-	-	-	ND	188	CAN CAUSE CANCER IN HUMANS.
COBALT	-	-	-	ND	ND	ND
COPPER	-	-	-	1.3	ND	GI DISTURBANCES; HEMORRHAGIC GASTRITIS.
LEAD	-	-	-	.050	238	NEUROLOGICAL DAMAGE; RENAL DISEASE; REPRODUCTIVE, CARDIOVASCULAR EFFECTS.
MANGANESE	-	-	-	.05	5625	CNS CHANGES; PSYCHIATRIC DISORDERS; LIVER CIRRHOSIS.
MOLYBDENUM	-	-	-	.07	56	LOW TOXICITY; CAN CAUSE IRRITATION TO MUCOUS MEMBRAN
NICKEL	-	-	-	.1	1125	ANIMAL CARCINOGEN; PROBABLE HUMAN CARCINOGEN; SKIN IRRITANT.
SELENIUM	-	-	-	.05	281	PALLOR; LASSITUDE; IRRITABLE; GIDDINESS; INDIGESTION POSSIBLE TRACE ELEMENT FOR MAN.
SILVER	-	-	-	.05	281	ARGYRIA - PERMANENT ASHEN GRAY COLORATION OF SKIN, CONJUCTIVAE, INTERNAL ORGANS.
THALLIUM	-	-	-	.002	4	VERY TOXIC; HAIR LOSS; GASTROENTERITIS; CNS AND REPRODUCTIVE EFFECTS.
URANIUM	-	-	-	.02	ND	TOXIC TO KIDNEYS; CELL DAMAGE.
VANADIUM	-	-	-	.007	169	EYE, SKIN IRRITANT, AFFECTS LUNG, KIDNEY, CNS.
ZINC	-	-	-	5	5625	SKIN SENSITIZATION; LUNG IRRITANT; NAUSEA; ESSENTIAL NUTRIENT.
FLUORIDE	-	-	-	ND	ND	ND
NITRATE	-	-	-	ND	ND	ND
BENZENE	-	-	-	.005	172	CNS DEPRESSANT; SKIN, EYE, LUNG IRRITANT; KNOWN HUM CARCINOGEN.
BIS(2-ETHYLHEXYL)PHTHALATE	-	-	-	.004	357	KNOWN ANIMAL CARCINOGEN; PROBABLE HUMAN CARCINOGEN; DAMAGE; GI DISORDERS; SUSPECTED TERATOGEN.
CHLOROBENZENE	-	-	-	.10	5100	IRRITATION OF EYE, NOSE, SKIN; LIVER DAMAGE; DROWSINESS; INCOHERENCE.
DDT	-	-	-	2.4E-08	15	IRRITANT; CNS EFFECTS; PROBABLE HUMAN CARCINOGEN.
1-2-DICHLOROBENZENE	-	-	-	.6	5063	POSSIBLE HUMAN CARCINOGEN; EYE, THROAT IRRITANT; DIZZINESS; BLOOD, KIDNEY, LIVER DAMAGE.
[illegible]	-	-	-	.07	563	DIZZINESS; EYE, NOSE, THROAT IRRITANT;

TRANS-1-2-DICHLORDETHYLENE	-	-	-	.1	1125	DIZZINESS; EYE, NOSE, THROAT IRRITANT; POSSIBLE LIVER DAMAGE.
1-2-DICHLOROPROPANE	-	-	-	.005	ND	DERMATITIS; EYE IRRITANT; NARCOSIS; LIVER, KIDNEY EFFECTS.
ENDOSULFAN	-	-	-	ND	ND	ND
[redacted](a)ANTHRACENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
BENZO(b)FLUORANTHENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
BENZO(k)FLUORANTHENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
BENZO(a)PYRENE	-	-	-	.0002	.44	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
CHRYSENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
DIBENZ(a-h)ANTHRACENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
INDENO(1-2-3-c-d)PYRENE	-	-	-	.0002	ND	PROBABLE HUMAN CARCINOGEN; SKIN DISORDERS; IMMUNOSUPRESSANT; LIVER, KIDNEY DAMAGE.
PCBs	-	-	-	.0005	.65	PROBABLE HUMAN CARCINOGEN; REPRODUCTIVE EFFECTS; DERMAL DAMAGE.
TOLUENE	-	-	-	1	11250	CNS DEPRESSANT; LIVER, KIDNEY DAMAGE.
TRICHLORDETHYLENE	-	-	-	.005	263	CNS DEPRESSANT; ANIMAL, PROBABLE HUMAN CARCINOGEN; GI TRACT CHANGES.
VINYL CHLORIDE	-	-	-	.002	ND	KNOWN HUMAN CARCINOGEN; CNS DEPRESSION; NAUSEA.

ND = NO DATA AVAILABLE OR INSUFFICIENT DATA.

See also SL-102

1157

SL-112
088916 01

Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for the St. Louis Site, Missouri

U.S. Department of Energy

4.14-1070.2

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Further Info? ☐

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Author/Originator Gregory McCabe, Dav **Company** EPA, MDNR, DGLS, **Date** 8/21/1992

Recipient (s) David Adler **Company (-ies)** DOE **Version** Final

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Include in which AR(s)?

- ☒ North County
- ☐ Madison
- ☐ Downtown
- ☐ Iowa

ETL 8

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