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DRAFT FINAL RISK ASSESSMENT WORK PLAN ADDENDUM

03/11/92

USEPA/DOE-FO
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LETTER

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

REPLY TO THE ATTENTION OF:

MAR 11 1992

Mr. Jack R. Craig
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

HRE-8J

RE: Draft Final Risk Assessment
Work Plan Addendum

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Draft Final Risk Assessment Work Plan Addendum. The U.S. EPA is pleased with the efforts on behalf of the United States Department of Energy (U.S. DOE) to satisfactorily address the large volume of complex comments presented by U.S. EPA. Although the Draft Final Plan has addressed the bulk of the comments, some concerns still exist. Specifically, U.S. EPA is concerned with incorporating the background sampling plan information into this Work Plan, statistical procedures, and ecological assessment.

U.S. EPA hereby approves the Work Plan pending incorporation of the enclosed comments. If U.S. DOE is unable to address any of the attached comments, within thirty (30) days of receipt of this letter, the U.S. EPA requests a meeting with U.S. DOE as soon as possible, to discuss any outstanding issues.

Please contact me at (312/FTS) 886-0992 if you have any questions.

Sincerely,

James A. Saric
Remedial Project Manager

Enclosure

cc: Graham Mitchell, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ

ATTACHMENT

DRAFT FINAL RISK ASSESSMENT WORK PLAN ADDENDUM FOR THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

TECHNICAL REVIEW

GENERAL COMMENTS

1. On January 16, 1992, the Department of Energy (DOE) presented a proposed background sampling plan at a meeting held in Chicago, Illinois, to discuss the FEMP risk assessment work plan addendum. It is not clear how or if this proposed plan was incorporated into the draft final risk assessment work plan addendum.

2. The above-mentioned proposed background sampling plan discusses soil sampling only, and, therefore, sampling procedures to be used for other media cannot be assessed from its review.

SPECIFIC COMMENTS

The following specific comment refers to the above-mentioned proposed background sampling plan:

1. The sampling plan states that a sufficient number of samples will be taken to adequately establish parameters for statistical evaluation, but it does not clearly discuss the criteria used to determine the "adequacy" of the data. The sampling plan states that this evaluation will be made on the basis of "past data," but the application of past data is not clear. The plan should clearly present the procedures, equations, and references to be used in evaluating the adequacy of sampling data.

The following specific comments refer to methods proposed in a memo presented at the above-mentioned meeting and incorporated into the above-mentioned draft final risk assessment work plan addendum:

2. Page 3, Section 4.2.1, Paragraph 2, Lines 12 to 19: Using r^2 alone to determine a linear relationship is not sufficient. A lack-of-fit test should be performed to determine the appropriateness of assuming a linear relationship.

3. Page 10, Section 4.3.1, Paragraph 1, Lines 4 to 10: Onsite concentrations should be compared to the lower confidence (tolerance) limits of background concentrations, rather than the upper confidence (tolerance) limits as proposed. This approach is more conservative and possibly more appropriate.

The following specific comment refers to the above-mentioned draft final risk assessment work plan addendum:

[redacted]

4. Page 24, Section 5.2.4, Paragraphs 4 and 5, Line 21 to 31: It is not clear from the site characterization if the surface water bodies located on the site contain water all year, or if they dry out in summer. If a surface water body (such as Paddy's Run) dries out in summer, then exposure to the sediments associated with that surface water body should be estimated using parameter values for exposure to surface soil during the dry period(s). This may result in the assumption of a greater exposure frequency, and a larger body surface area exposed.

[redacted]

U.S. EPA Air and Radiation Section
Comments on the Draft Final Risk Assessment Work Plan

Comment	Response
122:	A figure detailing Operable Unit #3 must be included in the Work Plan.
138/148:	This response does not reflect what is proposed in the background sampling plan. Sufficient background locations must be selected to assure a good mean value is developed.
151:	If the data is insufficient, U.S. DOE may be required to acquire more samples.
164:	Pb-212 is a typographical error, it should read Pb-210.
196:	Are resuspension rates, mass loading, and deposition velocities poorly quantified? If so why? While U.S. EPA does not generally approve oversimplified models, such as Box models, it may be appropriate to use if data is unavailable. However, more information is needed on the use of the Box model as it relates to the conceptual model of the site.
213:	This response cannot be adequately addressed without the Schaum 1991 letter. The Schaum 1991 letter must be included as a reference.
253:	Where age and gender are part of the scenarios, the age/gender specific factors should be used.
254:	U.S. DOE must avoid language that may unnecessarily discredit this document to the general public or the scientific community.
258:	Ten centimeters is too shallow, and unacceptable for surficial sampling.

[redacted]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: MAR 05 1992

SUBJECT: Review of the Draft Final Risk Assessment Work Plan Addendum for the Fernald Environmental Management Project (FEMP), Fernald, OH, February 1992

FROM: Pat Van Leeuwen, Toxicologist PVL
Technical Support Unit

TO: Jim Saric
Project Manager

I have reviewed the Draft Final Risk Assessment Work Plan Addendum for the Fernald Environmental Management Project (FEMP), formerly the Feed Material Production Center, Fernald, OH. dated February 1992. My review focused on responses and changes to the draft Work Plan Addendum prompted by comments from U.S. EPA, and in particular, by my review comments of November 18, 1991. In general, DOE seems to have conscientiously addressed the bulk of the large number of comments submitted on the draft document. I have only a few comments on lingering issues or problems created by revision.

Areas in the Draft Final Work Plan Addendem in need of additional correction or revision are described briefly below. If you or the contractors have any questions on these comments or any section of the risk assessment, please contact me at 886-4904.

Comment # 66 The averaging time (AT) for all non-carcinogenic exposure pathways remains in error. For non-carcinogens, the AT should be corrected to read "AT equals (ED) (365 days/yr). U.S.EPA avoids making this error by using as the demonimator value in all equations: BW x AT x 365 days/yr. In the latter presentation, AT is the averaging time in "years".

Comments # 69/75 Your comment package indicated that no text changes would be made in response to these comments. However, an examination of the final draft document shows that the units for the permeability constant (PC) shown in line 18, page 7.0-14, were changed to "L/cm2/hr". The units for this parameter value are now incorrect. The units for the chemical-specific PC should be changed to "cm/hr" and the volumetric conversion factor

[redacted]

(CF) should be put back in the equation. Such methodology changes should not be made without the approval of U.S. EPA.

Comment # 120 This comment prompted me to look more closely at risks to the community and to workers during remedial actions. In Section 10.2.3.2, page 23, Transportation Risks, the calculations for potential worker highway deaths and accident-related injuries are presented. U.S.EPA considers such risks to be beyond Agency control and does not consider them in the Remedial Alternatives risk assessment. Please refer to the Risk Assessment Guidance for Superfund: Volume 1 - Human Health Evaluation Manual (Part C, Risk Evaluation of Remedial Alternatives), Section 2.2.2, page 20, second paragraph: "It is important to note, however, that factors not associated directly with hazards particular to a given site (e.g. risk of accidents during offsite motor vehicle transport) are not usually considered during the FS, but instead should be addressed prior to remediation in the site health and safety plan."

The worker risk of highway death and injury is the same for all workers in the transport industry and is not related to this site. Even remedial workers driving to and from the site and drivers delivering other remediation materials to the site incur these risks. Such risks are beyond the Agency's calculation ability or scope of control.

Comments # 133/252 To repeat earlier comments, dose-response data from the open-literature can sometimes be used to derive toxicity values for both carcinogens and non-carcinogens. Often it is more appropriate to consider contaminants without toxicity values in a semi-quantitative or qualitative manner or to use modeling. All efforts to develop reference doses or slope factors should be undertaken in conjunction with the Environmental Criteria and Assessment Office (ECAO), Cincinnati. Please incorporate this viewpoint in the explanation beginning on page 3.0-6, line 5.

Comments # 146/156/273 Statistical methodologies provided by DOE for the selection of chemicals of concern and for the identification of hot-spots have been submitted for review to Paul White, U.S.EPA, Exposure Assessment Group, Washington. He has agreed to provide you with written comments on DOE's proposed methods.

Ibid On page 4.0-10, line 22, what is "EPA 19901"? This reference is not included in the List of References.

Comment # 184 Table 5-3 is still confusing in that it divides pathways by present and future contamination of media, while the usual category for division is land use. Some pathways still appear to be missing in the tabulation - i.e., for pathways # 34, 38 and 39, how does the change in access controls affect the contaminant level in the Great Miami River and the dermal contact, incidental ingestion and immersion irradiation pathways associated with swimming in this water? It would make

more sense to group pathways by land use - current land use, future land use and remediation activities, and within the land use, by target populations to which the pathway is applicable.

Comments 215/220/65 There still seems to be some confusion on the use of background concentrations. On page 7.0-4, lines 14-16 and 23-24 are contradictory. As we discussed at the FEMP RI/FS meeting in Chicago on January 16, 1992, it is permissible to subtract the background concentrations for naturally-occurring and some anthropogenic radionuclides from the measured concentrations in the calculation of site-related risks from these contaminants. It is not appropriate to subtract the background concentrations from the measured concentrations to calculate risks from non-radioactive compounds. Background concentrations of naturally-occurring inorganic contaminants are considered in choosing inorganic chemicals as "chemicals of concern" for the site. In the latter process, the background concentrations of organic chemicals are assumed to be zero. These points have not been accurately reflected the revised Work Plan. Please make these corrections in the text.

Comment # 233/72 Comment # 233 requested that values for body surface area for all age groups be made consistent with current guidance and refered the contractors to the OHEA document (OHEA-E-367), section 2.4 , for default values. I was unaware that values for body surface area proposed in comment # 72 would be adopted without a check of the reference document cited. The values incorporated in the table on page 7.0-17 are not very conservative. Using values from OHEA-E-367, the Total body surface area for the child <6 yrs would range from 7000-8000 cm2, for the child/teen from 15,150-16,550 cm2 and for the adult from 20,000-23,000 cm2, using the 50th and 95th percentile values for the ages of concern. For the dermal contact with soil pathways, it is appropriate to include the hands, legs, arms, neck and head, for an exposure of 25% of total body surface area. The range of values for the child/teen and the adult for soil contact pathways should be 3800-4200 cm2 and 1750-2000 cm2, respectively. The values for the creek wading pathway should be recalculated using the teen body weight as a percentage of adult body weight, and the range of values should be presented.

The new EPA document "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B, which should be available soon, reaffirms these values and suggests the use of the 95th percentile values as a reasonable maximun exposure value.

Changes to page 7.0-18 In the Exposure Duration (ED) section, to what does footnote "b" refer?

Comment #241 In equation 7-30, used to calculate the PC for other organics, "-2.73" should be "-2.72".

ATTACHMENT

Incorporation of responses into work plan - Several of the responses which adequately addressed EPA concerns should be incorporated into the work plan but were not; the "Action" was "No text change is required". The text of the following "Response" numbers must be included in the work plan: 270 (regarding use of total organic carbon data); 280 (regarding use of fate and transport modeling results conservatively); 283 (regarding use of bioconcentration factors); 291 (regarding additional field investigations); and 294 (regarding a summary of existing data).

Use of field derived plant uptake ratios - Upon review of the "Biological Sampling Analysis and Resources" report, the BTAG has determined that plant radionuclide concentrations should be modeled using both the Baes et. al ratios and the soil to plant ratios previously measured (rather than simply the previously measured plant concentrations). By using these measured ratios, a more conservative estimation of plant uptake can be made for plants growing in highly contaminated soils.

Earthworms may be an important exposure pathway - Comment response number 284 states that further information on the earthworm to robin exposure pathway would not influence ecological risk assessment. Justification is necessary for such a statement, which seems premature, and it should be deleted from the responses before they are approved. In addition, it is unclear why this response does not discuss the Osborne (1990, 1991) studies of robins.

Use of conservative and "average" exposure scenarios in ecological risk assessment modeling - Depending on the distribution of sampling point data, the area in question and the animal being exposed, exposure calculations should use both a mean soil, sediment and/or water concentration and a more conservative value of the mean plus one or two standard deviations. EPA will reserve the right to make final decisions on which values are ultimately used to assist with remediation decisions.

Comments on the Biological Sampling Analysis and Resource Report - Although this report was not officially reviewed for approval by the BTAG, but rather was used for its information, the following are some comments on this document:

Pg 3-11, bullet 3 - The text should state the species and numbers of fish in composited samples (whether different species composited together).

Pg 4-28, Table 4-13 - The composites of mouse and shrew need to be clarified as to how many of each animal were tested. In addition Page 4-27, Sec. 4.2.3 states that the carcass used in composites contained no detectable radionuclides, therefore the presence of 18 pCi/L in the composite should be addressed.

Pg 4-42, Table 4-22 - The levels of mercury detected in grass samples are extremely high. The area where these samples were collected may require more concentrated soil and/or biological sampling and should be further investigated.

Pg 5-2, para. 2 - A caged fish study to determine the bioaccumulation of uranium was conducted in 1990. These results should be made available.

Despite a wide range of analytical results, the conclusion that biota are exposed to radionuclides is valid. In addition, the water chemistry data from FEMP effluent tested for toxicity should be made available.

Comments on Statistical methodology - The selection of statistics to fit the data is the wrong approach. Statistical analyses should have been selected and resulting decision trees established before data collection. Use of a statistical approach to select contaminants of concern may not be appropriate for ecological assessment.

Overall comment - Normally EPA would not choose to use only risk assessment modeling for ecological assessment. Previous review of nature and extent of contamination in conjunction with information on site habitats would be used to design field studies where appropriate. The BTAG will evaluate results of the risk assessment; however further field studies may be appropriate.