



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

March 22, 2007

REPLY TO THE ATTENTION OF:

Mr. Johnny W. Reising
United States Department of Energy
Fernald Closure Project
175 Tri-County Parkway
Springdale, Ohio 45246

SR-6J

RE: Interim Residual Risk Assessment

Dear Mr. Reising:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the United States Department of Energy's (U.S. DOE) draft Interim Residual Risk Assessment (IRRA). The document provides results for various site use scenarios given the existing contaminant concentrations, and compares results of the IRRA with the Comprehensive Response Action Risk Evaluation.

Although this document has incorporated many previously agreed upon approaches and input, there are discrepancies that exist that must be addressed. Therefore, U.S. EPA disapproves the IRRA. U.S. DOE must submit responses to comments and a revised document within thirty (30) days receipt of this letter.

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "James A. Saric".

James A. Saric
Remedial Project Manager
Federal Facilities Section
SFD Remedial Response Branch #2

Enclosure

cc: Tom Schneider, OEPA-SWDO
Frank Johnston, Stoller

Heck
MAR 26 2007

**U.S. EPA COMMENTS ON
"INTERIM RESIDUAL RISK ASSESSMENT"**

FERNALD CLOSURE PROJECT

GENERAL COMMENTS

Commenting Organization: U.S. EPA
Section: NA Page #: NA
Original General Comment #: 1

Commentor: Saric
Lines #: NA

Comment: The "Interim Residual Risk Assessment" (IRRA) calculates and presents results that are identified as total risks minus radiological and chemical background risks (T-CRB). The purpose of these results is unclear. As discussed in the IRRA, U.S. Environmental Protection Agency (U.S. EPA) guidance recommends consideration of total risks minus radiological background risks (T-RB). U.S. EPA does not recommend subtracting chemical background risks from total risks; therefore, the IRRA should be revised either to (1) remove all T-CRB results and related discussion or (2) clearly and comprehensively explain and justify the inclusion of T-CRB results.

Commenting Organization: U.S. EPA
Section: NA Page #: NA
Original General Comment #: 2

Commentor: Saric
Lines #: NA

Comment: The IRRA estimates location-specific air concentrations of gases and particulates "using the concentration values for soil (Appendix B) and the air particulate and radon-222 data collected from the AMS-12 background location." This approach is adequate for generating estimates of chemical-specific ambient air concentrations associated with fugitive dust and ambient air concentrations of radon-222; however, the approach has limitations not discussed in the IRRA.

For example, the described approach is also used to estimate chemical-specific ambient air concentrations associated with particulates from construction work. Significant uncertainty is associated with the assumption that fugitive dust generated at a background location is representative of particulates generated from on-site construction activities. The IRRA should be revised either to (1) develop and present an alternate method for estimating construction work-specific particulate concentrations or (2) identify and discuss uncertainties associated with the current approach for estimating construction work-specific particulate concentrations. Also, the approach presented in the IRRA is used to estimate volatile organic compound (VOC) concentrations associated with airborne particles. Significant uncertainty is associated with this approach

because VOCs are not expected to adhere to particulates but rather to volatilize directly from soil into air. The IRRA should be revised either to (1) develop an alternate method for estimating airborne concentrations of VOCs from soil or (2) identify and discuss in Sections 4.7 and 5.8 the uncertainties associated with using the current approach for estimating VOC concentrations associated with airborne particulates.

Commenting Organization: U.S. EPA
 Section: NA Page #: NA
 Original General Comment #: 3

Commentor: Saric
 Lines #: NA

Comment: In Appendix E, tables identified as "SumPaths" summarize risk and hazard totals for each receptor and zone combination. The information in each initial summary table is difficult to follow and verify because hazard and risk results for chemical and radiological chemicals of potential concern (COPC) are combined. The tables should be revised to present chemical and radiological results in separate columns by pathway to allow easier review and verification.

Commenting Organization: U.S. EPA
 Section: NA Page #: NA
 Original General Comment #: 4

Commentor: Saric
 Lines #: NA

Comment: The IRRA uses the term "hazard quotient" (HQ) to represent the hazard posed by a single chemical through a single exposure pathway. This approach is correct and consistent with U.S. EPA's "Risk Assessment Guidance for Superfund" (RAGS) (U.S. EPA 1989); however, the IRRA also uses the term HQ to refer to the total hazard posed by all chemicals to which a receptor is exposed through a single exposure pathway and through multiple exposure pathways. Consistent with U.S. EPA's RAGS, the hazard totals for these last two cases should be referred to as "hazard indexes" (HI). The IRRA should be revised accordingly.

Commenting Organization: U.S. EPA
 Section: NA Page #: NA
 Original General Comment #: 5

Commentor: Saric
 Lines #: NA

Comment: To calculate surface areas (SA) over which receptors may be exposed to soil, the IRRA correctly and consistently includes the SA for feet; however, the text consistently omits feet as one of the body parts considered in calculating the total receptor-specific SA associated with potential dermal contact with soil. The IRRA should be revised to include feet in the list of body parts considered in calculating the total receptor-specific SA associated with potential dermal contact with soil.

Commenting Organization: U.S. EPA
 Section: NA Page #: NA
 Original General Comment #: 6

Commentor: Saric
 Lines #: NA

Comment: In the discussion of zone-specific total risks and hazards, the IRRA identifies the exposure pathways contributing most significantly to the total risks and hazards as “the most sensitive exposure pathways.” This term is not standard and may confuse some readers. Such exposure pathways are more often referred to as “risk drivers” or some similar term. The IRRA should be revised either to define the phrase “most sensitive exposure pathway” or use another term.

Commenting Organization: U.S. EPA
Section: NA **Page #:** NA
Original General Comment #: 7

Commentor: Saric
Lines #: NA

Comment: Editorial issues identified in the IRRA are summarized below.

- The table of contents (TOC) contains several errors. For example, Section 3.2 is misidentified as “Site Workers” and should be revised to “Museum Visitors.” Accordingly, Section 3.3 should be added to the TOC and labeled “Site Workers.” Also, the page numbers of several sections (such as Sections 3.2, 4.2, and 4.8) are incorrect.
- The acronyms and abbreviations (A&A) list contains several errors. First, several A&As (including ABS, CSV, DOE, HEAST, and RCRA) are not used in the IRRA. A&As not used in the IRRA should be removed from the A&A list. Second, several A&As in the text (such as CRB, $\mu\text{g}/\text{m}^3$, and pCi/m^3) are not included in the A&A list. The A&A list should be revised to include all terms used in the text of the IRRA. Third, the acronym “IR” is used to represent both ingestion rate and inhalation rate. The IRRA in general and the A&A list in particular should be revised to use different abbreviations for these two different terms.
- A&As are used in the text without being completely spelled out on first use (for example, see the use of IRIS and HEAST in the executive summary). The IRRA should be closely reviewed so that all A&As are spelled out upon their first use. Also, most A&As are apparently spelled out upon their first use in each section. This approach is contrary to common practice and results in unnecessary repetition. All A&As should be spelled out completely once upon their first use in the IRRA.
- Several references are cited without appropriate suffixes. For example, page 3-9 cites “EPA (1991)” as the source of the value used for exposure duration for workers; however, the reference list contains EPA (1991a), EPA (1991b), and EPA (1991c). The IRRA should be closely reviewed, and all reference citations should be

revised as needed for clarity and correctness.

Commenting Organization: U.S. EPA
 Section: NA Page #: NA
 Original General Comment #: 8

Commentor: Saric
 Lines #: NA

Comment: The single reference citation "(DOE 1995d)" is apparently used to refer to two separate documents: the Operable Unit (OU) 5 feasibility study (FS) and the comprehensive response action risk evaluation (CRARE). The IRRA should be revised either to provide separate references and citations for these two documents or clarify why a single reference is apparently used for two seemingly separate documents.

SPECIFIC COMMENTS

Commenting Organization: U.S. EPA
 Section: 2.0 Page #: 2-2
 Original Specific Comment #: 1

Commentor: Saric
 Lines #: NA

Comment: In the first full paragraph, the text states that the on-site disposal facility (OSDF) is "fenced and posted as no trespassing." Nonetheless, trespassing could theoretically occur at the OSDF. The IRRA should be revised to explain that the calculation of potential worker exposure at the OSDF is sufficiently conservative to represent any potential trespassing that may occur.

Commenting Organization: U.S. EPA
 Section: 3.1 Page #: 3-2
 Original Specific Comment #: 2

Commentor: Saric
 Lines #: NA

Comment: The first paragraph of this section states that visitors to the undeveloped park "inhale air that contains radon and soil particulates suspended by the wind." This statement is true, but park visitors may also be exposed to VOCs released directly into ambient air. The IRRA should be revised as needed to identify and discuss exposure to VOCs in ambient air as a potential exposure pathway.

Commenting Organization: U.S. EPA
 Section: 3.1 Page #: 3-4
 Original Specific Comment #: 3

Commentor: Saric
 Lines #: NA

Comment: The third bulleted item on this page identifies the ingestion rate (IR) for surface water as 0.035 liter per hour (L/hr) for child and youth receptors and 0.015 L/hr for adult and senior adult receptors. The IRRA does not discuss the basis for these rates other than to state that "incidental ingestion is attributed to illegal wading and splashing in the water." Section 3.1 should be revised to provide a more detailed explanation of how receptor-specific surface water IR values were determined.

Commenting Organization: U.S. EPA
 Section: 3.2 Page #: 3-7
 Original Specific Comment #: 4
 Comment: The first bulleted item on this page states that "the sum for these body parts appears in Table 3-1." This statement is incorrect; the values are presented in Table 3-2. Section 3.2 should be revised accordingly.

Commentor: Saric
 Lines #: NA

Commenting Organization: U.S. EPA
 Section: 4.1 Page #:
 Original Specific Comment #: 5
 Comment: The second paragraph of this section states that the "worker performing building maintenance will enter zones where buildings are present (Zones 7 and 8)." Table 4-1 indicates that this receptor is also exposed in Zone 2. Section 4.1 in particular and the IRRA in general should be reviewed and revised as necessary to correctly and consistently identify the zones that building maintenance workers may enter.

Commentor: Saric
 Lines #: NA

Commenting Organization: U.S. EPA
 Section: 4.4 Page #: 4-3
 Original Specific Comment #: 6
 Comment: Section 4.4 discusses the sources used to identify cancer slope factors and reference doses (RfD). For several sources listed in the text, including U.S. EPA's Integrated Risk Information System (IRIS), the Health Effects Assessment Summary Tables (HEAST), and Provisional Peer Reviewed Toxicity Values (PPRTV), no reference citations are provided. Section 4.4 should be revised to add the appropriate reference citations for these sources. The addition of proper reference citations will add to the veracity and clarity of the IRRA.

Commentor: Saric
 Lines #: NA

Commenting Organization: U.S. EPA
 Section: 5.4 Page #: 5-7
 Original Specific Comment #: 7
 Comment: The text discusses the risks and hazards calculated for the groundskeeper/sampler in zone 5 and presents the incremental lifetime cancer risk (ILCR) associated with dermal exposure to benzo(a)pyrene in surface water as 1.59E-05; however, the correct value (as presented in Table E.5-2) is 1.39E-05. Section 5.4 should be revised to correctly report the ILCR associated with dermal exposure to benzo(a)pyrene in surface water as 1.39E-05.

Commentor: Saric
 Lines #: NA

Commenting Organization: U.S. EPA
 Section: 5.8 Page #: 5-11
 Original Specific Comment #: 8
 Comment: The text explains that the greater risks from assuming that exposure occurs in the first 30 years of a receptor's life compared to risks from

Commentor: Saric
 Lines #: NA

assuming that exposure occurs as an adult and a senior adult "reflects a greater sensitivity to toxins for the child and youth receptors." This statement is misleading. Both sets of risk calculations use the same cancer slope factors (that is, *different cancer slope factors were not identified in order to reflect "greater sensitivity to toxins for the child and youth receptors"*). Instead, the difference in risks is the direct result of greater calculated exposures for child and youth receptors relative to adult and senior adult receptors. Section 5.8 should be revised to correctly explain the basis for the relative difference in risks calculated for child and youth receptors compared to adult and senior adult receptors.

Commenting Organization: U.S. EPA
 Section: 5.8
 Original Specific Comment #: 9

Pages #: 5-13 and 5-14

Commentor: Saric
 Lines #: NA

Comment: For the groundskeeper/sampler receptor, the total risk minus radiological background (T-RB) cancer risk in Zone 5 is presented as 1.33E-04. This value is incorrect; the correct value is 1.03E-04. Section 5.8 in particular and the IRRRA in general should be revised to correctly present this risk result.

Commenting Organization: U.S. EPA
 Section: Table D-1
 Original Specific Comment #: 10

Pages #: D-3 to D-5

Commentor: Saric
 Lines #: NA

Comment: Table D-1 presents toxicity values and cancer slope factors used in the IRRRA. Dermal RfD values and cancer slope factors were calculated based on their oral equivalents; however, several issues were identified with regard to the calculated dermal values. First, the chemical-specific gastrointestinal absorption factors (GIABS) used in the calculations are not provided or referenced. Second, U.S. EPA's RAGS Part E recommends calculating dermal RfD values and cancer slope factors only when a chemical's GIABS value is less than 50 percent. Otherwise, the unmodified oral RfD value or cancer slope factor should be used for the dermal exposure pathway (U.S. EPA 2004). As presented in Table D-1, dermal RfD values and cancer slope factors appear to have been calculated in all cases when the GIABS value is less than 100 percent. Table D-1 should be revised to present and reference the GIABS values used in the calculations and either (1) recalculate dermal RfD values and cancer slope factors in accordance with U.S. EPA guidance (U.S. EPA 2004) or (2) explain that the process used to calculate dermal RfD values and cancer slope factors differs from the U.S. EPA-recommended approach and also explain why the different approach is used instead of the U.S. EPA-recommended approach.

REFERENCES

U.S. Environmental Protection Agency (U.S. EPA). 1989. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A)" (RAGS). Interim Final. Office of Emergency and Remedial Response (OERR). EPA/540/1-89/002. December.

U.S. EPA. 2004. "Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)." Final. Office of Superfund Remediation and Technology Innovation. EPA/540/R/99/005. July.