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RESPONSES TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE MODIFICATION OF THE OPERABLE UNIT 3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN ADDENDUM

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RESPONSES

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OCT 25 1994

DOE-0108-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Saric:

RESPONSES TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE MODIFICATION OF THE OPERABLE UNIT 3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN ADDENDUM

The purpose of this letter is to transmit, for your review and approval, a set of responses, along with a change page, in order to address your comments on the draft submittal of the modification to the Operable Unit (OU) 3 Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum. Specifically, along with your conditional approval, the Department of Energy, Fernald Area Office, (DOE-FN) received three comments on the draft OU3 RI/FS modification document concerning: (1) justification for the significance of the 20-times Toxicity Characteristic Leaching Procedure (TCLP) value, (2) United States Environmental Protection Agency (U.S. EPA) concerns about the potential elimination of treatment options for the OU3 waste materials, and (3) an editorial error associated with the modification document. Responses are provided for each of these comments, along with an associated Change Page (Page 8). A copy of a recent Resource Conservation and Recovery Act (RCRA) Hotline Questions and Answers fact sheet is included to clarify the TCLP comment response.

If you or your staff have any questions, please contact either Robert J. Janke at (513) 648-3124 or John Hall at (513) 648-3118.

Sincerely,

for Johnny Reising

Jack R. Craig
Fernald Remedial Action
Project Manager

FN:RJJanke

Enclosures: As Stated

Recycled and Recyclable

cc w/ enc:

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Responses to U. S. EPA Comments on the OU 3 RI/FS Work Plan Addendum Modifications

Comment #1

Page 7, Section 3.4: Provide justification as to the use of the 20 x Toxicity Characteristic Leaching Procedure (TCLP) value as that used to drive remedial decisions relating to metals.

Response #1

Comparison of metals levels in solids with action levels which are 20 x TCLP, allows for a determination to be made as to whether or not the solids exhibit a toxicity characteristic. The 20 x TCLP is discussed in part in 40 CFR 261, Appendix II, but is discussed more comprehensively in a January 1994 RCRA "Hotline Questions and Answers" guidance sheet, which states that "[T]o evaluate the regulatory status of a 100% solid, a generator can simply divide each total constituent concentration by 20 and then compare the resulting maximum theoretical leachate concentration to the appropriate regulatory limit (the division factor reflects the 20-to-1 ratio of extraction fluid to solid used in the TCLP). If no maximum theoretical leachate concentration equals or exceeds the appropriate regulatory limit, the solid cannot exhibit the toxicity characteristic and the TCLP need not be run." Determining what amount of the solids have potential toxicity characteristics, aids in assessing the applicability of various disposal options for these solids, both on- and off-site, and the potential need for treatment, based on waste acceptance criteria. This is not to say, however, that final waste acceptance criteria may not drive the need to assess solids for other metals or levels of metals.

Comment #2

Page 20, Section 4.3: The revised approach to the OU 3 Feasibility Study indicates that treatment options for both on-site and off-site disposal will be eliminated since the major decision to be made in OU 3 is on-property versus off-property disposal. U.S. EPA disagrees with this justification and believes that treatment options must be discussed in more detail during the detailed analysis of alternatives in the FS. Treatment should be used whenever possible to reduce toxicity and mobility of the waste materials regardless of the disposal options.

Response #2

The assessment of treatment options within the OU3 Feasibility Study will not be eliminated. It is DOE's intention that treatment be utilized whenever practical to reduce toxicity, mobility, and volume of waste materials. Within the OU3 Feasibility Study, initial screening and evaluation of treatment options for each material category will occur, resulting in a selection of a representative approach to the treatment of that material.

However, the evaluation of treatment options is a secondary decision within the Feasibility Study. Treatment will be applied to the extent that implementation of the technology will result in disposition options which are more protective of human health and the environment and more cost effective. For example, a technology may be employed if the treatment would result in a material which could be free released versus buried in a controlled area. Based on this, the primary decision to be made within the Feasibility Study is the determination of the location for permanent disposal of contaminated materials, and determinations regarding treatment options will be made in support of this decision.

In summary, treatment technologies will be evaluated within the OU3 Feasibility Study. This evaluation will occur within the section titled Identification and Screening of Technologies and the selected representative technology for each material category and technology type will be carried forward to the development of alternatives.

Comment #3

Table 2B: This table is not consistent with the associated text in the document.

Response #3

Agree, the text and Table 2B are not consistent. The fourth paragraph on page 8 should be modified as follows:

> As can be seen in Table 2B, elevated concentrations occur, generally, at depths one and two, (within the first inch sampled) for barium, chromium, lead, and selenium. Elevated concentrations for mercury occur only at depth one and elevated concentrations for lead and selenium were also present at depth 3, otherwise values for all metals for all other depths approximate background. Background...."

This modification does not alter the conclusion drawn in Section 3.5.1, that no more than a small fraction of concrete site-wide would be expected to be contaminated at depth with metals at levels that would classify it as hazardous waste.

The purpose of the sampling is to determine the depth of penetration of specific contaminants in concrete where significant penetration is possible, primarily in "wet" process areas. The data will be used primarily to establish the potential disposition of concrete from such areas by surface-removal techniques and to estimate the volumes of concrete for various potential disposition options. Samples are taken at depths above and below a reasonable standard for treatment by surface-removal techniques, nominally 1 inch. The information on specific contaminants is needed to characterize the secondary waste stream, the abraded material, for use in identifying treatment and disposal options.

With these purposes in mind, the trending-set data were evaluated in terms of the depths of penetration of general metals contamination observed in the selected concrete samples, the depth profiles of individual metals, and the continued need for determining such profiles. The 20 x TCLP standard was applied for evaluating the potential waste classifications of the sampled materials and the associated disposition options. This standard represents the levels of RCRA-regulated constituents in waste media that, if not exceeded, would establish the waste as non-hazardous without further testing by the leaching procedure (TCLP). Exceeding these levels does not automatically classify a material as hazardous waste, but simply indicates that a material cannot be considered to be non-hazardous on this basis. Finally, a preliminary evaluation of the representativeness of the data and its applicability to decisions affecting the site as a whole was performed.

The trending-set for concrete cores for metals represents approximately 50% of the planned number of such samples for the RI/FS. Tables 2A and 2B identify the numbers of cores sampled per component and provide a summary of the metals analytical results for the concrete core data, respectively. Depths listed in Table 2B are per the OU3 RI/FS Work Plan Addendum, sampling and analysis plan; actual depths may vary.

As can be seenin Table 2B, elevated concentrations occur, generally, at depths one and two, (within the first inch sampled) for barium, chromium, lead, and selenium. Elevated concentrations for mercury occur only at depth one and elevated concentrations for selenium and lead were also present at depth three, otherwise values for all metals for all other depths approximate background. Background was determined by DOE from an analysis of 19 samples taken from non-process areas. Data from these samples were statistically evaluated for data distribution (normal, lognormal, or non-parametric). The 95th percentile was then calculated for normal and lognormal distributions, and extracted for non-parametric distributions. The 95th percentile is used for the background levels, except where the calculated 95th percentile exceeds the maximum value of the data set. The maximum value of the data set is used in cases where the 95th percentile exceeds the maximum. Measurements near background have substantially smaller variations (standard deviations) than measurements in contaminated areas.

With respect to the 20 x TCLP hazardous waste standard, the picture is very much the same. Lead, barium, and chromium exceed the standard, although primarily at depth one. The 15/141 values for lead in excess of the standard of 100 ppm range from 104 ppm to 1,210 ppm.

The concrete coring samples comprising the trending set represent a good cross-section of potentially contaminated component types (categories) in OU3. Building and non-building types of components are included. The building components represent the types most likely to be

RCRA

1. Use of Total Waste Analysis in Toxicity Characteristic Determinations

A generator suspects that his waste may exhibit the toxicity characteristic and thus be subject to regulation as a RCRA hazardous waste. Since he is unsure of the types and concentrations of hazardous contaminants present in the waste, he performs a total waste analysis. Can he use the results of the total waste analysis to make a toxicity characteristic determination, or must he perform Method 1311, the toxicity characteristic leaching procedure (TCLP), to determine the waste's regulatory status?

While a toxicity characteristic determination under §261.24 typically involves application of the TCLP followed by analysis of the TCLP extract, a generator may be able to use total waste analysis to demonstrate that a waste does not exhibit the toxicity characteristic. Section 1.2 of the TCLP states, "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run." This analysis can provide the generator with a convenient and cost-effective means of determining if he needs to run the TCLP in order to definitively characterize a waste.

The means for using total waste analysis results to make a toxicity characteristic determination reflect TCLP methodology and therefore vary depending on whether the waste is defined as a liquid, a solid, or a dual-phase waste. Under the TCLP, liquid wastes (i.e., those wastes that contain less than 0.5% dry solids) do not require extraction. The waste, after filtration, is defined as the TCLP extract (Part 261, Appendix II, §2.1). A generator can therefore characterize a liquid waste by filtering the waste, measuring total constituent concentrations in the resulting filtrate, and comparing these concentrations to the appropriate regulatory limits under §261.24.

Wastes which are either 100% solid (i.e., wastes that contain no filterable liquid (Part 261, Appendix II, §7.1.1.1)) or which contain both a liquid and a solid component require conversion of total waste analysis data to estimates of constituent concentrations in the TCLP extract, or maximum theoretical leachate concentrations. For instance, to evaluate the regulatory status of a 100% solid, a generator can simply divide each total constituent concentration by 20 and then compare the resulting maximum theoretical leachate concentration to the appropriate regulatory limit (the division factor reflects the 20-to-1 ratio of extraction fluid to solid used in the TCLP). If no maximum theoretical leachate concentration equals or exceeds the appropriate regulatory limit, the solid cannot exhibit the toxicity characteristic and the TCLP need not be run.

The generator of a dual-phase waste (i.e., a waste which has both a solid and a filterable liquid component) can perform a total waste analysis on the liquid and solid portions and calculate maximum theoretical leachate

concentrations for the waste as a whole by combining results mathematically through use of the following formula:

$$\frac{[A \times B] + [C \times D]}{B + [20\ L/kg \times D]} = M$$

where:

A= concentration of the analyte in the liquid portion of the sample (mg/L)

B= volume of the liquid portion of the sample (L)

C= concentration of the analyte in the solid portion of the sample (mg/kg)

D= weight of the solid portion of the sample (kg)

M= maximum theoretical leachate concentration (mg/L)

For example:

A generator who receives the results of a total waste analysis wishes to determine if his waste exhibits the toxicity characteristic for lead. Since he knows the lead concentration in each phase of the waste (0.023 mg/L in the liquid phase, 85 mg/kg in the solid phase), the volume of the liquid phase (0.025 L), and the weight of the solid phase (0.075 kg), he can calculate the waste's maximum theoretical leachate concentration:

$$\frac{[A \times B] + [C \times D]}{B + [20\ L/kg \times D]} =$$

$$\frac{[0.023\ mg/L \times 0.025\ L] + [85\ mg/kg \times 0.075\ kg]}{0.025\ L + [20\ L/kg \times 0.075\ kg]}$$

$$= 4.18\ mg/L$$

Because the 4.18 mg/L maximum theoretical leachate concentration is below the 5.0 mg/L regulatory limit, the generator determines that the waste cannot exhibit the toxicity characteristic for lead.

If maximum theoretical leachate concentrations are less than the applicable limits under §261.24, the waste does not exhibit the toxicity characteristic and the TCLP need not be run. If, on the other hand, total waste analysis data yield a maximum theoretical leachate concentration that equals or exceeds the toxicity characteristic threshold, the data cannot be used to conclusively demonstrate that the waste does not exhibit the toxicity characteristic. The generator may have to conduct further testing to make a definitive toxicity characteristic determination.

EPCRA

2. Recycle/Reuse of Toxic Chemicals in Closed-Loop Refrigeration Systems under EPCRA §313

Many facilities maintain recycle/reuse operations such as closed-loop refrigeration systems. If a facility utilizes 15,000 pounds of ammonia as a coolant in a closed-loop refrigeration system, this amount of the toxic chemical is considered otherwise used under EPCRA §313 because the ammonia is not incorporated into the final product. According to Directive #7 of Toxic Chemical Release Inventory Questions and Answers, Revised 1990 Version, only the amount of a toxic chemical added to a refrigeration system during the reporting year must be included in the threshold calculation. If the facility replaces its refrigeration system but uses the same ammonia to maintain the new system,