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TRANSMITTAL OF COMMENT RESPONSES ON THE FINAL OPERABLE UNIT 3 REMEDIAL INVESTIGATION FEASIBILITY STUDY WORK PLAN ADDENDUM

07/09/93

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Department of Energy
Fernald Environmental Management Project
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357

JUL 09 1993

DOE-2428-93

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:

TRANSMITTAL OF COMMENT RESPONSES ON THE FINAL OPERABLE UNIT 3 REMEDIAL INVESTIGATION FEASIBILITY STUDY WORK PLAN ADDENDUM

The purpose of this letter is to transmit, for your review and approval, the enclosed package containing responses to the comments received from the United States Environmental Protection Agency (U.S. EPA) on the final Operable Unit (OU) 3 Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum (WPA). Also enclosed are change pages that are to replace their respective pages in the WPA.

Based on the terms of the Amended Consent Agreement, Section XB, and the approval of the WPA, the following schedule represents the primary and secondary document milestone dates for completing the RI/FS for OU 3:

- Submit Treatability Study Work Plan to U.S. EPA: January 15, 1994
- Submit Remedial Investigation Report/Baseline Risk Assessment to U.S. EPA: March 13, 1996
- Submit Feasibility Study Report/Proposed Plan to U.S. EPA: August 7, 1996
- Submit draft Record of Decision for OU 3 to U.S. EPA: April 2, 1997

Also, as per the approved WPA, the Initial Screening of Alternative Report has been consolidated into the Feasibility Study Report and therefore, no longer represents a separate milestone deliverable to EPA.

Recycled and Recyclable

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

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Murphy

Enclosures: As Stated

cc w/enc:

G. E. Mitchell, OEPA, Dayton
K. A. Chaney, EM-424, TREV
D. R. Kozlowski, EM-424 TREV
G. Jablonowski, USEPA-V, AT-18J
J. Kwasniewski, OEPA-Columbus
P. Harris, OEPA-Dayton
M. Proffitt, OEPA-Dayton
T. Schneider, OEPA-Dayton
J. Michaels, PRC
L. August, GeoTrans
K. L. Alkema, FERMCO
P. F. Clay, FERMCO/19
F. Bell, ATSDR
AR Coordinator, FERMCO

cc w/o enc:

J. King, FERMCO
G. Latulippe, FERMCO

Responses to USEPA Comments on the Final OU3 RI/FS Work Plan Addendum

Comment #1

Page 2-53, Table 2-6. The final Work Plan Addendum (WPA) did not incorporate the three redlined items added to Table 2-6 (page 2-64 of the Comment Response Package [CRP]) that noted areas of potential thorium contamination.

Response #1

Paragraph 2 of Page 2-48 lists the components that potentially have significant levels of thorium contamination. This list was compiled based primarily on process knowledge. However, the classification of components into "significant contamination" and "no significant contamination" categories are based solely on applying the surface contamination guidelines shown in Table 2.3 on the radiological data presented in Table A.4.0 of the final WPA, not on process knowledge. Therefore, adding these components to Table 2.6 of the CRP was determined to be unnecessary and possibly misleading and was intentionally removed.

The deletion of these thorium warehouses from the classification table does not affect whether or not they are sampled. All of the components that have a potential for significant thorium contamination are included in the field characterization program.

Comment #2

Page D.3-4, Airborne Radioactivity Section. The minimum operation time for a general air sampler is 168 hours at a flow rate of 60 L/min in the final WPA, while the CRP shows this minimum to be 24 hours.

Response #2

A CRU3 RI/FS consultant in the radiological analytical field has reviewed the final WPA and the CRP to ensure that any reference to radiological/analytical sampling and analysis was correct and feasible. Typical current radionuclide air concentrations within the components are on the order of 10^{-13} to 10^{-12} μCi/ml. If the general air sampler runs for only 24 hours as stated in the CRP, the associated error for the analytical results would be approximately

+/-100%. The total air volume necessary to achieve the analytical sensitivity required would be more consistent with a 168-hour (or 7-day) duration which has been adopted as a revision in the final WPA submittal.

Comment #3

Page D.3-6, Second Italicized Paragraph. The language in the final WPA is different from the language on Page D.3-7 of the CRP. The CRP language explained the rationale behind the sampling approach in response to U.S. EPA's comment.

Response #3

The three sentences that explained the rationale behind the sampling approach for chemical contamination had been inadvertently deleted from page D.3-6 of the final WPA. Therefore, page D.3-6 has been revised accordingly and the replacement page has been included as part of this transmittal.

Comment #4

Page D.4-1, Paragraph 2. The introductory language in the final WPA was changed from the language in the CRP. The reference to the target analyte list was deleted and a new sentence was added on how analytes would be specified.

Response #4

Tables and figures appear on the next available page(s) after they have first been referenced. These references have not been placed within the introductory sections to avoid bunching a large number of tables and figures at the front of each section. Therefore, in an effort to retain the consistency of the layout of the document, the discussion leading up to the presentation of Table D.4-6 can be found in Section D.4.3.1. This change does not alter or reduce the emphasis of what is discussed in the introduction to Section D.4.

Responses to USEPA Comments on the Final OU3 RI/FS Work Plan Addendum

Comment #5

Page D.4-14, Table D.4-4. The Likely Sources for the "Other" Analysis Class in the final WPA are "General industrial (ammonia, sulfides, oils and greases)." On page D.4-15, Table D.4-4 of the CRP, the Likely Sources are "General industrial (inorganic, nitrogen, cyanide, phenols)."

Response #5

The listing of contaminants after "General Industrial" in Table D.4-4 gives examples of potential contaminants of concern from the "Other" category in Table D.4-3. The list of examples should include ammonia (inorganic nitrogen), cyanide, and phenols. Therefore, page D.4-14 has been revised accordingly and the replacement page has been included as part of this transmittal.

Comment #6

Page D.5-11. The sentence that was to be added to the end of Section D.5.1.3.3 was not included. This sentence (the first sentence on page D.5-13 of the CRP) reads "As experience is gained and the application of field portable XRF is developed at the FEMP, it is anticipated that the total analyte list will be expanded."

Response #6

The sentence had been deleted from the final WPA because it is an erroneous statement. The total analyte list, presented as Table D.4-6, contains, within the "Inorganics" category, the full and complete list of analytes that the field sampling program will analyze for. The field portable XRF is only reasonably capable of accurate readings for a portion of the analytes of the full list. The portable XRF is not capable of detecting any inorganics that are not already listed in Table D.4-6, with the exception of molybdenum, which is not a contaminant of concern within Operable Unit 3. Therefore, the results of the field XRF readings are not anticipated to form a basis for expanding the total analyte list.

Responses to USEPA Comments on the Final OU3 RI/FS Work Plan Addendum

Comment #7

Component-Specific Write-ups of Sampling and Analysis Plan. The CRP (Response #7 in the Responses to General USEPA Comments on the Operable Unit 3 Sampling and Analysis Plan) states that a subsection will be added to the component-specific write-ups. This subsection would include the sentence: "One airborne particulate sample will be collected in the component and analyzed for radiological and inorganic contaminants, as well as asbestos, on the basis of Protocol 1." This sentence was changed in the component-specific write-ups of the final WPA to read: "One airborne particulate sample will be collected in the component and analyzed for radiological contaminants on the basis of Protocol 1." It is unclear if inorganic contaminants and asbestos were deleted altogether or whether they are covered elsewhere under a different protocol. DOE should explain why the analytes were deleted.

Response #7

During a review of the WPA for consistency before issuing the final document, it was discovered that the statement in the CRP disagreed with Sections D.5.1.1.4 and D.5.1.2.4, "Air Sampling". The text of these sections states that the airborne particulate sample will be "...sent to an analytical laboratory for ASL D radionuclide analysis."

The discrepancy has been corrected to reflect that analyses for inorganic contaminants and asbestos are unnecessary, based on the following reasons:

- All three analyses listed (inorganics, radiological, and asbestos) are all destructive analytical methods, meaning that each test would have to destroy (e.g., digest) the filter for analysis. Therefore, additional sampling would be required to complete all three analyses.

- There is currently a site-wide asbestos monitoring program, performed by the FERMCO Industrial Hygiene department, to identify airborne asbestos levels in areas that may require additional personal protective equipment for nearby workers. As this sampling is being already being performed, it is therefore not necessary to be included as part of the OU3 field characterization program.

- The data needs, as outlined in Table 4.2, do not identify airborne inorganics as a requirement for the completion of the baseline risk assessment (BRA).

Based on these reasons, the text in the component-specific write-ups regarding analyzing airborne particulate filters for asbestos and inorganic contaminants has been intentionally removed to agree with Section D.5.

Comment #8

Page D.I-71, Table D.I.3.15. The Highest Allowable Minimum Detectable Concentration (HAMDC) for air filters is 30 pCi per filter in the addendum. The CRP states that the HAMDC concentration is 10 pCi per filter. However, the table in the final WPA is the same as the ASL B - Gross Beta Activity Table in the Final Site-Wide CERCLA Quality Assurance Project Plan.

Response #8

As stated on page D.I-66 of the CRP, the Performance Based Criteria for the Radiochemical Analysis were only in the first draft and, at the time, were being reviewed by DOE and EPA. The HAMDC concentration for Gross Beta Activity was changed due to comments received from these agencies. The Performance Based Criteria tables included in the final work plan addendum are the same as in the Site-Wide CERCLA Quality Assurance Project Plan recently approved by the EPA, so the 30 pCi per filter is consistent between the documents.

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Container Leakage

The volume of contaminated liquids in various process containers, the concentration of the contaminants in the liquids, and any release rates of these liquids are needed to assess risks associated with the migration of such contaminants. Values for liquid volumes and composition are sought, along with a conservative estimate of release rate. To meet these objectives, container dimensions will be measured and potential leak rates postulated, and composition of unknown liquids will be determined from grab samples where volume is sufficient to provide for desired analysis.

Ponds and Basins

Identification and preliminary characterization of potential contaminant sources and pathways is the principal goal of the surface water and sediment sampling of ponds and basins. The collection of surface water and sediment samples is designed to identify and characterize radiological and chemical contamination in ponds and basins. To ensure that the characteristics of the pond/basin are accurately portrayed, grab surface water and sediment samples will be collected at one point in time, in various locations to be uniformly distributed over the impoundment. Samples will be representative of the basins (through not statistically stated), with locations based on process knowledge, existing data, instrument surveys, and observations. Grab/intrusive samples will be collected and composited for submittal for laboratory analysis. Grab and composite sampling strategies are based on protocol specified in the SCQ, Section K.4.3.

D.3.3 Representativeness, Analytical Support Levels, and Sensitivity Requirements

D.3.3.1 Representativeness and Sampling Approach

Sample locations, frequencies, and types must be selected in such a manner that the information gained from the samples represents specific properties of the true underlying distribution of contaminants that are of interest for the intended uses of the data. The particular properties of the distribution that are of interest dictate the design of the sampling program. For instance, if the properties of interest are mean contaminant levels in a certain medium, a statistically based, unbiased selection of sample locations and numbers would be appropriate. In the present case, the properties of contaminant distribution of interest are those necessary for evaluating RAAs — principally the type, extent, and depth of surface contamination in large-volume materials in OU3. The sampling approach developed for the RI field program is therefore designed to determine these properties. The constraint on the approach is the determination of these properties within the uncertainty requirements specified in the DQOs for the RI as they relate to volumes of various categories of expected waste materials from OU3.

Because of the great complexity and heterogeneity of OU3, it is neither feasible nor cost-effective to design a sampling program that quantitatively addresses uncertainty, hence the qualitative nature of the uncertainty requirements in the DQOs. Instead, an approach was devised that is essentially mechanistic, assuring that data needs are met through purposeful sampling. The devised approach is based on some important underlying assumptions regarding representativeness, as follows:

1. The composition of contaminants is uniform within a given medium within a given process area.

2. The location of maximum surface level and/or depth of contamination in a given medium will dictate the treatment option for the entire extent of the medium in a given process area (i.e., it represents the medium for treatment purposes).

3. The types of contaminants present place further constraints on treatment options.

The fundamental conceptual and organizational unit under this approach is the process area. Process areas are defined on the basis of function. Therefore, a component that houses a single operation may be broken down into several process areas, each involving a distinct set of materials and equipment. On the basis of this definition, and following assumption 1, above, the process area becomes the basic unit of representativeness for contaminant composition.

The quantitative aspect of representativeness is addressed in assumption 2. The quantity of interest in the investigation is that quantity of each major material from a given process area that will fall into various waste categories. As stated in the assumption, the maximum surface level and/or depth of contamination represents the entire extent of the medium within the process area for treatment purposes. This assumption assures a conservative estimate of waste volumes, guarding against the possibility of a false negative outcome, or underestimate, which is consistent with the stated goals of the uncertainty constraints.

Lastly, regarding the representativeness of contaminant identifications, which affects the applicability of various treatment options, a wide variety of potential contaminants must be considered. Potential contaminants come from the process materials themselves, reagents added to the process, and ancillary materials used in general industrial processes. Such potential contaminant sources represent a fairly large number of both radiological and chemical contaminants. The possibility of mixed radiological and hazardous waste is clearly present and will certainly affect treatment and disposal options for affected materials.

Taking these three assumptions regarding representativeness together, the following sampling approach was devised:

A single intrusive sample taken from each major medium in each defined process area at the location of greatest known surface level and/or depth of radiological contamination will be analyzed for all radiological contaminants of potential concern.

A single intrusive sample will be collected from each major medium in each defined process area at the location of highest expected surface levels of chemical contamination. These single intrusive samples will be of sufficient quantity to meet the requirements for analysis and will be split for each chemical analyte class of potential concern. However, multiple intrusions may be required to collect sufficient sample volume. This approach is based upon the assumption that a single, split sample collected at one specific location will be more truly representative of the actual contamination at that location than a series of individual intrusive samples collected at or adjacent to a hot spot location. The sample location will be determined on the basis of a combination of process knowledge, visual clues, and field screening measurements, and will be analyzed for each analyte group relevant for the medium.

This approach addresses the primary data needs for supporting RAA evaluation, and will also coincidentally meet much of the data needs for the baseline risk assessment. Further data needs for both RAA evaluation and the baseline risk assessment will be met through nonintrusive sampling and supplemental intrusive sampling, as described in Section D.3.4.3.2 and D.3.4.4, respectively.

TABLE D.4-3 Potential Contaminants of Concern

Radionuclides
- Americium-241
- Cesium-137
- Lead-210
- Neptunium-237
- Plutonium-238, 239, 240, 241, and 242
- Polonium-210
- Radium-226, and 228
- Strontium-90
- Thorium-228, 230, 232, and 234
- Technetium-99
- Uranium-233, 234, 235, 236, and 238

Volatile Organics
- 1,1-Dichloroethene
- 1,1,1-Trichloroethane
- 1,2-Dichloroethane
- Acetone
- Benzene
- Carbon Tetrachloride
- Chlorobenzene
- Chloroform
- Ethylbenzene
- Methanol
- Methylene Chloride
- Methyl Ethyl Ketone (2-butanone)
- Tetrachloroethane
- Tetrachloroethene
- Toluene
- Trichloroethene
- Vinyl Chloride
- Xylenes

Semivolatile Organics
- Chlordane
- Diamyl Amyl Phosphonate
- Ethylene Glycol
- PCBs
- Pentachlorophenol
- Tributyl Phosphate

Petroleum, Oil, and Lubricants (POL)
- Diesel Fuel
- Fuel Oil
- Gasoline
- Hydraulic Oil
- Kerosene
- Lubricating Oil
- Motor Oil
- Naphtha Spirits

Inorganics
- Aluminum
- Arsenic
- Barium
- Beryllium
- Cadmium
- Calcium
- Chromium
- Cobalt
- Copper
- Europium
- Germanium
- Lanthanum
- Lead
- Lithium
- Magnesium
- Mercury
- Molybdenum
- Nickel
- Niobium
- Platinum
- Potassium
- Selenium
- Silver
- Sodium
- Tin
- Titanium
- Vanadium
- Yttrium
- Zinc
- Zirconium

Anions
- Chloride
- Fluorides
- Nitrates
- Phosphates
- Sulfates

Other
- Ammonia
- Asbestos
- Cyanide
- Phenols (total)
- Sulfide

TABLE D.4-4 Chemical Contaminants of Interest by Analysis Class

Analysis Class[a]	Likely Sources	Concerns/Rationale
VOCs (33)	Solvents, fuels, POL	Toxicity, volume, mobility
SVOCs (64)	General industrial, POL	Toxicity
PCBs (7)	Transformers High temperature uses	Toxicity, persistence
Metals (23)	Ores, waste streams	Toxicity, volume
Anions	Acids, salts (nitrate, sulfate, phosphate, fluoride, chloride)	Water quality (runoff)
Other	General industrial (ammonia, cyanide, phenols)	Water quality

[a] Number in parentheses are the approximate number of analytes determined in the corresponding group by EPA methods.