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MODIFICATION OF THE OPERABLE UNIT 3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN ADDENDUM AND SCHEDULE

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ADDENDUM

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Department of Energy
Fernald Environmental Management Project
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AUG 09 1994

DOE-2209-94

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Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
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Dear Mr. Saric and Mr. Schneider:

MODIFICATION OF THE OPERABLE UNIT 3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN ADDENDUM AND SCHEDULE

The purpose of this letter is to transmit, for your review and approval, modifications to the Operable Unit (OU) 3 Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum, including a proposed revision to the schedule outlined in the Amended Consent Agreement for OU3. Similar to the cost and time savings which will be realized by the interim remedial action decision for OU3, the enclosed proposed changes to the OU3 RI/FS approach represent a significant step forward in expediting the cleanup and disposition of the former production facilities, as well as significantly reducing overall costs.

The enclosed OU3 RI/FS Work Plan Addendum modification document is composed of six main sections:

Section 1 - Introduction
Section 2 - Elimination of the OU3 stand-alone baseline risk assessment
Section 3 - Reduction in the OU3 field characterization program
Section 4 - Modifications in the approach of the OU3 feasibility study
Section 5 - Revised RI/FS schedule
Section 6 - References

As shown in Section 5, the proposed revision to the OU3 RI/FS schedule includes the submittal of a combined RI, FS, and Proposed Plan document to both the United States Environmental Protection Agency (U. S. EPA) and the Ohio Environmental Protection Agency (OEPA) on September 11, 1995 and a proposed draft final Record of Decision (ROD) on July 25, 1996. This revised schedule represents an acceleration of the OU3 Amended Consent Agreement ROD date by over nine months. As agreed in our recent meetings, the basis for this accelerated OU3 schedule consists of the elimination of a OU3 stand-alone baseline risk assessment, the outlined reductions in the OU3 field characterization program, and the OU3 feasibility study approach described. Based on your prior concurrence, reductions in the OU3 field characterization program have already been implemented.

The elimination of a separate OU3 baseline risk assessment is justified since the general level of risk associated with the current conditions and the cause of the risks has already been addressed by several efforts. In addition, ongoing monitoring and surveillance of the site indicates that no significant off-site risks are associated with OU3 in its current condition. Such monitoring information has already been used to assess current site risks, including those associated with OU3, in the Site-Wide Characterization Report and the Preliminary Site-Wide Baseline Risk Assessment. Also, the Proposed Plan/Environmental Assessment for the interim remedial action provided a brief qualitative assessment of current risks. Therefore, the National Contingency Plan (NCP) requirements will be met by the completion of the RI/FS.

In addition, enclosed with the proposed OU3 RI/FS Work Plan Addendum modifications are three copies of the final, signed OU3 Interim Record of Decision.

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

Sincerely,

for Johnny Reising

Jack R. Craig
Associate Director
Environmental Management

FN:RJJanke

Enclosures: As Stated

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5827

MODIFICATION OF THE

OPERABLE UNIT 3 RI/FS WORK PLAN ADDENDUM

August 1994

U. S. Department of Energy

Fernald Environmental Management Project

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this document is to amend the Operable Unit (OU) 3 Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum. Based on the recently initiated OU3 interim remedial action, the focused nature of OU3, and the initial OU3 field characterization results, this modification to the RI/FS Work Plan Addendum outlines: (1) justification for eliminating the OU3 stand-alone Baseline Risk Assessment, (2) justification for a reduced field characterization program, (3) proposed revisions in the approach to performing the OU3 Feasibility Study (FS), and (4) a revised OU3 RI/FS schedule with milestones.

OU3 is not a typical operable unit either in terms of the problems that need to be addressed or in terms of the approach that is being taken to address those problems. Other than soil piles, OU3 contains no environmental media, only structures and other improvements. In addition, the United States Department of Energy (DOE) has proposed and recently obtained approval from the United States Environmental Protection Agency (U. S. EPA) and the Ohio Environmental Protection Agency (OEPA) to remove all structures in OU3 because: (1) the structures have exceeded (or will soon exceed) their design life, (2) they have no additional use beyond the period of remediation, and (3) the potential for releases of contaminants from the structures increases as the structures continue to deteriorate. It is recognized that when remedial action for OU3 is complete, OU3 will no longer exist.

DOE is now in the process of initiating an interim remedial action that will allow dismantlement of buildings and other components to begin before the final OU3 Record of Decision (ROD). The Proposed Plan for the interim remedial action was approved by U. S. EPA and OEPA in November, 1993. The decision concerning the interim remedial action was recently documented in an interim ROD. The proposed draft interim ROD and the draft final interim ROD were approved by both U. S. EPA and OEPA in early May, 1994. The final interim ROD was signed by the U. S. EPA on July 22, 1994.

The interim remedial action decision for OU3 specifies that the structures and other components will be dismantled with the resulting wastes, generally, placed in interim storage until a decision is made in the final ROD concerning waste disposition. The interim ROD requires that DOE not keep wastes from the demolition of OU3 structures in interim storage for any extended period. With the interim ROD, only alternatives for managing the waste generated by the interim remedial action will be addressed in the OU3 Feasibility Study. The decision that will remain will be how, in the final remedial action for OU3, to treat and disposition the majority of the wastes generated by the interim remedial action.

The remainder of this document consists of Sections 2 through 6. Section 2 provides the justification and recommendation for eliminating the OU3 stand-alone baseline risk assessment. Section 3 provides an overview of data needs and uses, as described in the Work Plan Addendum, followed by the recommendation, with supporting justification, to reduce the field characterization program based on the elimination of the stand-alone baseline risk assessment and based on conclusions from a trending analysis done using initial field characterization results. Section 4 is an overview of the proposed modifications in the approach for developing the Feasibility Study. Section 5 provides the revised OU3 RI/FS schedule. Finally, Section 6 is a list of references.

2.0 ELIMINATION OF THE OPERABLE UNIT 3 STAND-ALONE BASELINE RISK ASSESSMENT

2.1 INTRODUCTION

The purpose of this section is to present the rationale and justification for the elimination of a stand-alone Operable Unit 3 baseline risk assessment as part of the RI report. As discussed below, the primary justification for eliminating the stand-alone OU3 baseline risk assessment is that it is unnecessary for OU3 since no significant risk-management decisions will be influenced by the results of such an assessment. This section also discusses how the limited objectives that need to be met by an OU3 baseline risk assessment can be addressed without the use of a stand-alone document. Section 2.2 summarizes the approach to the OU3 baseline risk assessment given in the Work Plan Addendum. Section 2.3 discusses the justification for elimination of a stand-alone baseline risk assessment and explains how the limited objectives of an OU3 baseline risk assessment can be met. Finally, Section 2.4 presents DOE's recommendation to eliminate the stand-alone baseline risk assessment.

2.2 BACKGROUND: THE ORIGINAL APPROACH TO THE OPERABLE UNIT 3 BASELINE RISK ASSESSMENT PRESENTED IN THE WORK PLAN ADDENDUM

Section 3.1 of the approved RI/FS Work Plan Addendum (DOE, 1993) presents an approach to the OU3 baseline risk assessment. The following paragraphs briefly summarize the approach presented in the Work Plan Addendum.

A major consequence of the interim remedial action is that there are two baselines that would apply to OU3: (1) structures in place (i.e., current conditions) and (2) structures removed and the resulting wastes in interim storage (i.e., conditions addressed by the no-further-action remedial alternative in the FS). A two-staged approach to assessing baseline risks was, therefore, necessary with the advent of the interim action in order to address both baselines. Although the second baseline does not correspond to any conditions actually expected in the future, it is the logical consequence of no further action following the interim remedial action. Both baselines were to be considered in the approach to the OU3 baseline risk assessment, as discussed in the RI/FS Work Plan Addendum.

The analysis for the first stage of the assessment (the first baseline) presented in the RI/FS Work Plan Addendum was intended to address current land-use conditions only. Baseline conditions in OU3 will be changing during the interim remedial action and a long-term assessment would not reflect actual conditions. A scenario considering future land-use conditions was not included in the first-stage assessment because it was recognized that (1) a ROD for the interim remedial action would be in place before completion of the OU3 baseline risk assessment and (2) significant effort would have already begun to implement the interim action. In addition, no cleanup criteria will be developed for OU3 that would require evaluation of future land-use conditions assuming OU3 structures in place.

As outlined in the Work Plan Addendum, the first stage of the baseline risk assessment addresses current land-use conditions with and without access controls. A high level of uncertainty and conservative results were determined to be acceptable for the risks estimated for current conditions for the first-stage assessment because a decision concerning the interim remedial action was forthcoming.

The second stage of the baseline risk assessment (the second baseline) was intended to address both current land-use conditions (with and without access controls) and future land-use conditions in which there is no federal control of the site. The future land-use case included an on-site resident farmer as a receptor. The analysis for the second stage was to be used to provide a formal evaluation of the no-further-action alternative for the final remedial action. The analysis outlined in the Work Plan Addendum was to address hypothetical conditions (i.e., all wastes assumed to be in interim storage) and would have been conservative because an implicit decision had already been made concerning the need for a final remedial action.

2.3 JUSTIFICATION FOR THE ELIMINATION OF THE OPERABLE UNIT 3 STAND-ALONE BASELINE RISK ASSESSMENT

A separate OU3 baseline risk assessment should not be completed because such an assessment is not necessary to determine what actions are necessary to reduce risks, to justify action, or to select the best remedy for OU3. Because of the nature of OU3, the purpose of an OU3 baseline risk assessment is different from a typical baseline risk assessment. In particular, a baseline risk assessment for OU3 is not required to accomplish the following:

- To determine whether the interim remedial action was necessary or to show that it was unnecessary. Since the decision for the OU3 interim remedial action was made prior to the initiation of any baseline risk assessment, the decision that remains is how, in the final remedial action for OU3, to treat and dispose of the majority of the wastes generated by the interim action.

- To determine whether a final remedial action is necessary or to show that it is unnecessary. As noted previously, the interim ROD requires that wastes generated by the interim remedial action will not remain in interim storage for any extended period.

- To support development of cleanup criteria for the operable unit. OU3 will be completely eliminated by the interim and final remedial actions. OU3 contains no environmental media for which OU3-specific cleanup criteria will be developed and the Work Plan Addendum states that it is anticipated that no risk-based release limits will be developed for any material released from OU3. Cleanup criteria developed for OU5 will be applied, if appropriate, to the management of soil piles. Guidelines developed by the Nuclear Regulatory Commission and by DOE will be used as the basis for the release of selected materials, such as non-porous structural materials.

Therefore, an OU3 baseline risk assessment would serve only limited objectives. An OU3 baseline risk assessment would (1) document the general level of risk associated with current conditions and the primary causes of that risk, (2) provide an analysis for the no-further-action remedial alternative for the final remedial action, in order to allow a formal evaluation of the alternative, and (3) identify contaminants of concern. However, these objectives can be accomplished without a stand-alone baseline risk assessment.

The objective of documenting the general level of risk associated with current conditions and the cause of the risks has been addressed by several efforts. Ongoing monitoring and surveillance of the site indicates that no significant off-site risks are associated with OU3 in its current condition. Such monitoring information has already been used to assess current site risks, including those associated with OU3, in the Site-Wide Characterization Report and the Preliminary Site-Wide Baseline Risk Assessment (DOE, 1992a). The Proposed Plan/Environmental Assessment (DOE, 1993) for the interim remedial action provides a brief qualitative assessment of current risks.

The analysis of the no-further-action alternative for the final remedial alternative, the second objective, can be provided in the FS report. A semi-quantitative evaluation using data collected in the OU3 field will be adequate for assessing this alternative. (See also the discussion in Section 4.3.)

Identification of contaminants of concern, the third objective, can be done independently in the RI report. Compounds in the OU3 field-characterization analyte list will be screened based on toxicological considerations and based on a comparison with background levels to provide contaminants of concern. No risk-based screening will be used to reduce the range of contaminants to be considered.

Therefore, because the limited objectives of a baseline risk assessment for OU3 can be adequately accomplished without a stand-alone document addressing this topic, there is no justification for preparing such a document. However, in any case, it should be noted that no significant risk management decisions are expected to be influenced by the results of an OU3 baseline risk assessment.

2.4 RECOMMENDATION TO ELIMINATE THE OPERABLE UNIT 3 STAND-ALONE BASELINE RISK ASSESSMENT

Elimination of the stand-alone OU3 baseline risk assessment as part of the RI report is justified based on the various factors discussed above. In addition, the elimination of the stand-alone OU3 baseline risk assessment would have several advantages: (1) it would shorten the time until the final ROD for OU3, (2) it would reduce costs, and (3) it would eliminate the need to invest efforts in carrying out an extensive baseline risk assessment for which little benefit is expected. Therefore, DOE recommends (1) that the requirement in the Amended Consent Agreement for a stand-alone baseline risk assessment for OU3 be eliminated, (2) that the no-further-action alternative for the final remedial action be evaluated in the FS report (see Section 4) and (3) that contaminants of concern be identified independently in the RI report. Also, as a consequence of eliminating the stand-alone baseline risk assessment, no transport-and-fate analysis would be included in the RI report. Addressing only the limited objectives of a baseline risk assessment that are actually significant for OU3 would allow some reductions in the OU3 RI/FS sampling and analysis program. These reductions are discussed in Section 3.

3.0 REDUCTION IN THE OPERABLE UNIT 3 FIELD CHARACTERIZATION PROGRAM

3.1 INTRODUCTION

The objective of the OU3 RI/FS field program is to collect information through sampling and analysis and through review of process knowledge to support remedial action decisions for the operable unit and to provide preliminary input into the remedial design. The OU3 RI/FS Work Plan Addendum committed to an analysis of initial data coming out of the field program for the purpose of discerning any trends in the data that might help focus the scope of subsequent sampling activities. Preparation of an interim report on initial results to be submitted to U.S. and Ohio EPAs was also a part of this commitment. A trending analysis has now been carried out and is included as part of this document. The results of this analysis indicate that part of the field program should be reduced since the initial data adequately satisfy some of the data needs outlined in the Work Plan Addendum.

In fulfilling the commitment to perform a trending analysis, DOE has compiled summaries of the initial sampling and analysis results from the field program comprised of data for metals (target analyte list) in concrete and steel media and for radionuclides for steel media. This "trending set" represents 42% of the total number of sample locations planned for metals and 10% of the total number of sample locations planned for radionuclides in these media.

The primary purpose of this section is to analyze the trending-set data and recommend appropriate modifications in the sampling and analysis activity, consistent with the intentions of the Work Plan Addendum. Regarding metals data, only the eight metals from the RCRA hazardous characteristics list are addressed, as these drive most of the waste-management decisions that will be required related to toxic metals. The standard set of radionuclides identified in the OU3 Work Plan Addendum were analyzed in the steel scrapings and are discussed here.

This section also considers changes possible in the sampling and analysis program as a consequence of elimination of the stand-alone baseline work assessment. Recommended related modifications in the sampling and analysis program are provided.

Section 3.2 reviews overall data uses in the RI/FS process for OU3. Next, the types of field measurements that can potentially be eliminated with the elimination of the OU3 baseline risk assessment are discussed in Section 3.2. The scope of the trending set is discussed in Section 3.4. An evaluation of the trending is presented in Section 3.5 and discussions of the recommended sampling and analysis program modifications are provided in Section 3.6.

3.2 BACKGROUND: GENERAL REVIEW OF OVERALL DATA USES

Assuming that the requirement for a stand-alone baseline risk assessment is eliminated, data uses will generally be confined to preparing the FS, recognizing that some of the data needs initially identified for the stand-alone baseline risk assessment will also be relevant to the "no action" alternative under FS risk assessment. Also, as will be discussed later, RI/FS data may be used to partially support waste management and disposition activities under remedial actions.

For the FS, first-order data uses are to determine refined media volume estimates for various waste classifications. Such volumes will be used in evaluating remedial-action alternatives in terms of treatment and disposal needs, costs, and implementability and environmental impacts. Specific data uses are estimating the future volumes of the following waste classes for each medium clean waste/debris, low-level waste, hazardous waste, TSCA waste (PCBs and asbestos) and mixed waste. Apportioning media by such waste classes will be performed using information available from intrusive sampling and analysis, field instrument surveys and process knowledge. The focus of the field program is on major media, i.e., concrete, masonry, and steel, as well as other significant materials such as transite. The scope of the program also includes loose media, liquids and HVAC equipment.

Second-order data uses in the FS are related to determining the waste characteristics and potential treatability of various media to reduce waste volume or contaminant mobility. Data from measurements on waste characteristics, such as that determined by leachability tests, may be used to project treatment needs for hazardous and/or mixed wastes, and may provide useful inputs to the planning of various treatability studies. It should be noted that the RI/FS Work Plan Addendum did not identify leachability, except for treated wastes, as an FS data need, but only for supporting the baseline risk assessment. However, limited leachability studies should be of value in the FS for the data uses mentioned above and for conducting risk assessments for the various alternatives.

Regarding treatability, measurements of depth of contamination in concrete and masonry will be used to evaluate potential surface removal or bulk treatment requirements and feasibility. Information on the types and concentrations of contaminants present in surface layers or at depth will be used in identifying potential treatment technologies and disposal options that may be required for secondary waste streams from such primary treatment processes.

3.3 TYPES OF FIELD MEASUREMENTS POTENTIALLY ELIMINATED WITH THE A STAND-ALONE BASELINE RISK ASSESSMENT

Elimination of a stand-alone baseline risk assessment would mean that certain types of field measurements could also be eliminated. Specifically, the types of measurements that are affected are as follows: (1) composite swipes for components that were to be analyzed for radionuclides for use in characterizing contaminant source terms in the baseline risk assessment; (2) air-particulate samples in components that were to be analyzed for radionuclides for evaluating exposure scenarios in which receptors enter intact components; and (3) direct gamma-ray radiation exposure rates from surfaces, which were to be used in evaluating similar scenarios where receptors are exposed directly to radioactive surfaces. These measurements were intended to provide results useful for evaluating current conditions. Measurements of the direct gamma-ray radiation exposure rates were completed prior to this proposal to modify the field program, however, and therefore are not subject to reductions at this time.

With respect to the first two types of measurements, planning activities identified 103 composite swipe samples and 133 air particulate samples out of a total of 833 sampling locations. Of the combined 236 such samples, 165 remain to be taken, which represents a potential reduction of 30% of the total number of sampling locations for radiological analysis. Table 1 includes a listing by component category of the air-particulate and composite-swipe samples already taken versus those samples that are proposed to be eliminated.

3.4 SCOPE AND USES OF TRENDING SET SUMMARIES

The trending-set data summaries include data for metals in concrete and steel (surface scrapings) and for radionuclides in steel scrapings.

The trending set represents approximately 75% of the total number of proposed sampling locations for metals analysis. As will be discussed below in greater detail, the locations and size of the trending set appears to be sufficient for representing the two media for making inferences regarding further sampling needs.

With respect to evaluating further sampling needs, various parameters of the trending set were examined, including the range, mean, and standard deviation of the concentration of various analytes in the two media. Metals data were evaluated for concrete cores and steel coatings scrapings media in comparison to an action level that will probably drive remedial action decisions related to metals, namely, levels in wastes of 20 x TCLP. Also, radioisotopic data were evaluated for steel coatings scrapings media in order to ascertain the general nature of the radionuclides present. On the basis of these evaluations, recommendations for reducing the field sampling for metals have previously been made to both OEPA and U. S. EPA and are further outlined below.

In addition to examining possible modifications to the sampling program, the trending-set was evaluated in light of the original purposes and objectives of the sampling program, i.e., characterizing media. The implications of the evaluation with respect to remedial-action alternatives are discussed below.

3.5 TRENDING SET EVALUATION

3.5.1 CONCRETE CORES

Measurements that are termed "concrete cores" are actually simply measurements of contaminant depth profiles obtained through repeated grinding of the exposed surface. Actual cores are not obtained. Surface-activity measurements are taken at each depth in the field, while the collected media is containerized for laboratory analysis.

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 seen in Table 2B, elevated concentrations occur, generally, only at depth one, roughly the first 0.5 inch sampled, compared to background, and only for lead, barium, chromium, mercury and selenium. Elevated concentrations for selenium occurs at depths two to three and for lead at depth two also. 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 contaminated. Therefore, on the basis of component type, and assuming reasonable representativeness for the actual sampling locations, it can be concluded that conditions of metals contamination in concrete, in general, are probably no worse than conditions found in the trending set for concrete coring. Furthermore, no more that 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.

3.5.2 STEEL SCRAPINGS

Steel-scraping samples were taken to provide information for evaluating various disposition options for steel. Currently, the leading option is recycling and reuse within the DOE complex. Other options include possible disposal on- or off-property. Any of these options may be impacted by the status of the steel with respect to hazardous-waste regulations. Potential metals contamination is assumed to be confined to the surfaces of steel, either through contamination from activities in the vicinity of a particular structural member or through the application of surface coatings. The ramifications of surface metals contamination are not entirely clear. One result might be a requirement that a contaminated steel member be sampled on a total mass basis by drilling through it for further hazardous-waste characterization. It is possible that such a requirement may be waived for recycling options. In that case, information on surface metals contamination may be of value for identifying undesirable contaminants in, or byproducts of, smelting or decontamination processes.

The following discussion focuses on an evaluation of the trending-set data for steel scrapings. The trending set, representing approximately 50% of planned steel-scraping samples, is summarized in Tables 3A and 3B for metals and Tables 4A and 4B for radiological constituents.

The results for metals for steel scrapings are quite clear-cut: the presence of high levels of chromium, lead and other RCRA metals probably classify the scrapings as RCRA hazardous waste. If it is necessary to determine the RCRA status of the actual steel members, sampling on a total-mass basis, as mentioned above, is in order. Regarding evaluating results for the coatings from the standpoint of recycling, the trending-set data present a sufficient understanding of conditions for that purpose.

It is likely that a large fraction of the samples in the trending set were taken from locations where chromium and/or lead-based paints were used. For the purpose of identifying such coatings, no further intrusive sampling should be necessary. It should be easy to correlate the sample results with the appearance of the sampled surface to identify metal-based paints. Moreover, the levels of lead and chromium observed in the trending set should be readily detectable by the available x-ray fluorescence field instrument.

As with the concrete samples, it is useful to review the types of components included in the trending set before drawing conclusions about OU3 as a whole. Tables 3A and 4A list the number of samples of steel scrapings taken from various types of components in the trending sets for metals and radionuclides, respectively. Likewise, Tables 3B and 4B summarize the corresponding results for metals and radionuclides. As the steel-scrapings data indicate, the structural steel across the site is generally contaminated with both RCRA metals and radionuclides. Therefore, some type of decontamination process will be necessary prior to any release without restrictions. Presumably, given the non-porous nature of the structural steel, some type of surface removal technique could be used. The planned analysis of the structural steel was to support a conservative assessment of the volume of contaminated structural steel. Given the nature of the initial surface scraping results, sufficient data are now available to assess, conservatively, the volume of structural steel contaminated both chemically and radiologically.

The component types from which steel scrapings were taken represent those likely to be most highly contaminated. The majority of components sampled for either metals or radiological contaminants were either process or process-support buildings. Other types of components sampled that might be among the most highly contaminated included a storage pad, soil piles and aboveground containers. Therefore, conclusions drawn from the trending set data should be quite conservative when applied to OU3 as a whole.

3.6 RECOMMENDATIONS RELATED TO THE FIELD PROGRAM

In summary, it appears that little of the concrete in OU3 is hazardous waste under RCRA. Also, it does not appear that significant penetration of metals contamination into concrete exists. Steel coatings, when considered in isolation, probably are hazardous waste and should be addressed accordingly. As one would expect given the process history, steel coatings are contaminated with radionuclides with the principle radiological constituent being uranium-238. On the basis of the trending-set results, it appears that sampling for metals should be curtailed for the third concrete core segments. Conversely, there is no indication that expansion of any aspect of the metals sampling program is needed. The elimination of data needs associated with the baseline risk assessment was discussed above. Table 5 summarizes DOE's recommended reductions in the sampling and analysis program accrued from both the elimination of the stand-alone baseline risk assessment and the results of the analysis of the trending-set data for metals and radionuclides. Table 1 presents the proposed number of samples for each media or sample type.

TABLE 1

SUMMARY OF REVISED OU3 RI/FS SAMPLING PROGRAM BASED ON ELIMINATION OF SELECTED SAMPLES

Media Type (Analysis)	COMPONENT CATEGORY (No. of Components in Category)																		Totals by Media	
	Process Buildings (26)		Process Support Buildings (21)		Whse. & Storage Buildings (22)		Storage Pads/ Roads (22)		Admin./ Support Buildings (6)		Containerized Material [1] (16)		Utilities Piping & Equipmt.[1] (12)		Soil Piles/ Bulk Mat'l. (2)		Ponds & Basins (8)			
	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC	COMPLT.	TBC
Concrete Cores (1"-4" interval) (TAL metals)	44	5	13	2	na	na	2	3	3	0	9	1	2	1	na	na	1	0	74	12
Steel Coatings (Rad)	63	23	8	14	4	8	3	0	2	0	2	7	0	8	na	na	na	na	82	60
Steel Coatings (TAL Metals)	77	9	20	2	13	0	na	na	2	0	7	2	6	2	na	na	na	na	125	15
Air Particulate Filters (Rad)	25	3	8	19	3	10	0	22	2	6	0	15	0	10	0	2	0	8	38	95
Composite Swipes (Rad)	12	15	7	20	3	10	5	1	2	6	2	9	2	6	0	1	0	2	33	70

NOTE: "COMPLT." represents the number of samples completed; "TBC" - To Be Cancelled.
1 These component categories are subdivided into aboveground and below-ground groups in the Work Plan Addendum.
na Not applicable; no samples identified in WPA/SAP.

TABLE 2A

IDENTIFICATION OF SAMPLE NUMBERS PER COMPONENT FOR CONCRETE CORE DATA

COMPONENT	CATEGORY	DESCRIPTION	NO. CORE SAMPLE INTERNALS
10B	Process Support	Boiler Plant Maintenance	4
12A	Process Support	Main Maintenance Building	15
13A	Process	Pilot Plant Wet Side	25
19D	Above-ground Containers	Old North Tank Farm	6
25E	Process Support	Digester and Control Bld.	3
39A	Process	Incinerator Building	6
3B	Process Support	Ozone Building	3
3D	Above-ground Containers	NAR Towers and Tanks	3
3K	Above-ground Piping, Utilities	Old Cooling Water Tower	3
3A	Process Support	Maintenance Building	3
2A	Process	Ore Refinery Plant	7
4A	Process	Green Salt Plant	7
54A	Process	Pilot Plant UF_6 to UF_4 Facility	6
5A	Process	Metals Production Plant	9
6A	Process	Metals Fabrication Plant	3
74R	Storage Pad	Plant 8 North Pad	3
8A	Process	Scrap Recovery Plant	7
9A	Process	Special Products Plant	15
9B	Process	Plant 9 Sump Treatment	3

TABLE 2B
SUMMARY OF METALS ANALYTICAL RESULTS FOR CONCRETE CORE SAMPLES*

	MEAN (STD DEV) n = 131 Core Sample Intervals MG/KG					
METAL	0.0 TO 0.5" DEPTH	0.5 TO 1.0" DEPTH	1.0" AND LOWER DEPTH	OVERALL MEAN (SD)(MG/KG)	20X TCLP (MG/KG) (#EXCEEDED)	ESTIMATED BACKGROUND (MG/KG)
Arsenic	6.9(6.1)	5.4(2.7)	5.1(4.6)	5.8(4.8)	100 (0)	6.76
Barium	406.5(982.1)	88.9(128.9)	55.2(30.0)	189.5(608.0)	2000 (3)	70.4
Cadmium	1.8(1.2)	2.0(1.4)	2.2(1.7)	2.0(1.4)	20 (0)	2.40
Chromium	38.3(65.4)	21.7(43.5)	15.1(18.9)	25.9(49.2)	100 (6)	12.5
Lead	104.4(206.1)	27.1(49.8)	9.2(9.6)	51.9(138.1)	100 (15)	5.80
Mercury	0.4(0.5)	0.1(0.1)	0.1(0.1)	0.3(0.4)	4.0 (0)	0.07
Selenium	5.8(2.8)	4.3(2.2)	3.1(2.2)	4.6(2.7)	20 (0)	0.49
Silver	4.7(5.8)	3.7(3.8)	5.0(4.6)	4.5(4.8)	100 (0)	4.90

* - OU3 RI DATA COMPLETE IN THE SITE ENVIRONMENTAL DATA BASE AS OF JULY 14, 1994

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TABLE 3A
IDENTIFICATION OF SAMPLE NUMBERS PER COMPONENT FOR STEEL SCRAPINGS DATA

COMPONENT	CATEGORY	DESCRIPTION	NO. OF SAMPLES
12A	Process Support	Main Maintenance Building	6
13A	Process	Pilot Plant Wet Side	3
19D	Above Ground Containers	Old North Tank Farm	1
39A	Process	Incinerator Building	4
45A	Administration Support	Rust Engineering Building	1
54A	Process	Six to Four Reduction Facility #1	3
68	Warehouse/Storage	Pilot Plant Warehouse	1
2A	Process	Ore Refinery Plant	5
3A	Process Support	Maintenance Building	1
3B	Process Support	Ozone Building	1
3C	Support	NAR Control House	1
3D	Above Ground Containers	NAR Towers and Tanks	1
4A	Process	Green Salt Plant	4
4C	Process Support	Plant 4 Maintenance Building	1
5A	Process	Metals Production Plant	10
37	Process	Pilot Plant Annex	1
3E	Process	Hot Raffinate Building	1
6B	Warehouse/Storage	Plant 6 Covered Storage Area	1
6F	Process	Plant 6 Salt Oil Heat Treat Building	1
8A	Process	Scrap Recovery Plant	16
8F	Ponds and Basins	Plant 8 Old Drum Washer	1
9A	Process	Special Products Plant	7
9B	Process	Plant 9 Sump Treatment Facility	1
77	Warehouse/Storage	Finished Products Warehouse (4A)	1

TABLE 3B

SUMMARY OF METALS TRENDING SET DATA FOR STEEL SCRAPINGS

METAL	RANGE (MG/KG)	MEAN AND STD DEV (MG/KG) (n = 73)	20X TCLP (MG/KG) (# EXCEEDING)
Arsenic	1.40-227.00	28.2(45.1)	100 (4)
Barium	13.40-12300.00	1458.7(2498.4)	2000 (14)
Cadmium	1.10-558.00	40.7(85.8)	20 (26)
Chromium	26.80-17300.00	3494.9(3988.3)	100 (70)
Lead	34.00-375000.00	59193.8(68565.3)	100 (74)
Mercury	0.15-32.60	5.9(8.6)	4.0 (21)
Selenium	1.10-77.50	13.2(20.5)	20 (2)
Silver	0.29-59.20	7.3(12.8)	100 (0)

TABLE 4A

IDENTIFICATION OF SAMPLE NUMBERS PER COMPONENT* FOR STEEL-SCRAPINGS DATA RADIOCHEMICAL ANALYTES

COMPONENT	CATEGORY	DESCRIPTION	NO. OF SAMPLES
45A	Administration	Rust Engineering Building	1
3D	Above-ground Containers	NAR Towers and Tanks	1
54A	Process	Pilot Plant UF_6 to UF_4 Facility	2
5A	Process	Metals Production Plant	1
9A	Process	Special Products Plant	6

*Components in which preliminary data is available

TABLE 4B
SUMMARY OF RADIOLOGICAL RESULTS FOR STEEL SCRAPINGS DATA[3]

	MEAN RESULT (pCi/g)	MAXIMUM RESULT (pCi/g)	MINIMUM RESULT (pCi/g)	# OF SAMPLES[1]
Uranium 234	1507 ±242	4300 ±640[3]	47 ±17	11/11
Uranium 235/236	160.0 ±30	600 ±81	2.6 ±15	11/11
Uranium 238	2257 ±337	8800 ±1300	45 ±17	11/11
Plutonium 238	0.2 ±0.1	0.2 ±0.1	0.2 ±0.1	2/11
Plutonium 239/240	0.9 ±0.2	3.4 ±0.5	0.2 ±0.1	9/11
Plutonium 241	-4.7 ±0.6	59 ±62	-10.3 ±5.8	5/11
Americium 241	2.0 ±0.4	15 ±2.9	0.2 ±0.1	10/11
Radium 226	0.8 ± 0.8	2.2 ±0.2	0.1 ±0.0	11/11
Radium 228	27.7 ±0.8	170 ±15	-0.2 ±0.0	10/11
Neptunium 237	0.7 ±0.1	2.0 ±0.3	0.3 ±0.1	5/11
Lead 210	-8.1 ±0.8	-0.1 ±0.0	-32 ±2.9	11/11
Thorium 228	19.0 ±2.0	110 ±11	0.5 ±0.2	11/11
Thorium 230	9.0 ±1.1	55 ±5.6	1.2 ±0.3	11/11
Thorium 227	8.9 ±2.4	45 ±8.5	0.4 ±0.9	10/11
Thorium 232	18.5 ±2	100 ±11	0.1 ±0.1	10/11
Cesium 137	0.6 ±0.0	2.9 ±0.3	0.2 ±0.0	7/11
Total Uranium[2]	10661	62000	140	11/11

[1] Number of samples above minimum detectable concentration (MDC) over total number of samples analyzed/
[2] Total uranium reported in μg/kg
[3] ± value represents total propagated error (TPU)

Note: Negative values result from calculating the MDC (Minimum Detectable Concentration) by subtracting out the blank sample results.

TABLE 5
SUMMARY OF RECOMMENDED REDUCTIONS IN THE OPERABLE UNIT 3
RI/FS SAMPLING AND ANALYSIS PROGRAM

Inputs/Affected Parameters	Recommendation
Baseline Risk Assessment Elimination	
Component Swipes (radionuclides)	Eliminate component swipes.
Component Air Samples (radionuclides)	Eliminate component air particulate samples.
Gamma Exposure Rates	Already completed.
Metals Trending-Set Data	
Concrete Cores	Curtail concrete coring sampling for depth 3.
Steel Scrapings	Curtail steel scrapings for metals.
Radiological Trending-Set Data	
Steel Scrapings	Curtail steel scrapings for radiological parameters

4.0 MODIFICATIONS IN THE APPROACH FOR THE OPERABLE UNIT 3 FEASIBILITY STUDY

4.1 INTRODUCTION

As noted above, remedial activity for OU3 is separated into two parts: an interim remedial action, which will decontaminate and dismantle all structures within the operable unit, and a final remedial action, which will address the disposition of most materials generated by the interim action. The scope of the final remedial action is limited because of the interim action and will include only treatment and disposition of materials. A general approach to carrying out the feasibility study for the final remedial action is provided in the OU3 RI/FS Work Plan Addendum. A number of changes in the approach to be used for the feasibility study are now proposed in order to make the document consistent with the elimination of a stand-alone baseline risk assessment and with the use of disposal and release criteria for the disposition of OU3 materials that takes advantage of the analysis and results that will be provided by OU5.

Section 4.2 summarizes relevant topics related to the feasibility study addressed in the Work Plan Addendum. Section 4.3 discusses proposed revisions in the approach to the feasibility study. Finally, Section 4.4 summarizes DOE's recommendations related to changes in the feasibility study.

4.2 BACKGROUND: APPROACH TO THE FEASIBILITY STUDY DEFINED IN THE OU3 RI/FS WORK PLAN ADDENDUM

The Work Plan Addendum addressed the following topics related to the feasibility study for the final remedial action for OU3:

- The preliminary identification of applicable or relevant and appropriate requirements and to-be-considered criteria;
- Preliminary remedial action objectives;
- General response actions, potential technology types, and process options;
- Preliminary remedial action alternatives; and
- The approach to evaluation of the final alternatives.

The first three topics are not related to any revisions proposed for the feasibility study and are not discussed here. The preliminary alternatives and the approach to be used to evaluate alternatives would be modified somewhat under the revised approach proposed in Section 4.3; therefore, the approaches from the Work Plan Addendum related to these two topics are summarized briefly in the following three paragraphs.

The preliminary remedial action alternatives identified in the Work Plan Addendum are: (1) no (further) action, (2) in-situ stabilization/containment, (3) disposal/recycle, and (4) treatment and disposal/recycle. For Alternatives 3 and 4, disposal could be either on or off site. Alternative 2 was intended to address bulk materials (soil piles, scrap metal piles) that would not be addressed by the interim remedial action. Because no bulk materials will remain to be addressed by the OU3 final remedial action, Alternative 2 is no longer relevant. Scrap metal piles will be removed prior to the final remedial action and soil will be managed by OU5.

The Work Plan Addendum assumes that the no-action alternative will be evaluated in the baseline risk assessment. It is stated that the baseline risk assessment will provide an evaluation of baseline conditions corresponding to the no-action alternative, considering current and future conditions, numerous receptors, and a range of exposure pathways. Because it was planned to evaluate the no-action alternative on the basis of results provided by the baseline risk assessment, no discussion is provided (or was necessary) concerning how the evaluation of risks for the no-action alternative is to be done in the FS report.

The Work Plan Addendum proposes that the OU3 Initial Screening of Alternatives (ISA) report specified in the Amended Consent Agreement be eliminated and that the screening of alternatives be presented in the feasibility study. In a letter to DOE dated January 6, 1994, U. S. EPA granted a schedule extension for submittal of the ISA report until August 7, 1996, when the report would be incorporated into Section 2 of the FS report. Section 4.3 confirms this approach with minor changes.

4.3 REVISED APPROACH TO THE OPERABLE UNIT 3 FEASIBILITY STUDY

The revised preliminary remedial alternatives that DOE proposes to be considered in the feasibility study are (1) no (further) action, (2) on-site disposal, and (3) off-site disposal. The action alternatives are modified from the action alternatives identified in the Work Plan Addendum. As noted above, the in-situ stabilization/containment alternative identified in the Work Plan Addendum is no longer relevant because the bulk materials being addressed by the alternative will not be addressed by the final remedial action. The other two action alternatives identified in the Work Plan Addendum emphasized the level of treatment to be provided by the final remedial action (i.e. disposal/recycle versus treatment and disposal/recycle). However, the major decision to be made concerning OU3 materials is their disposition, not the level of treatment. Therefore, it is more appropriate to emphasize this decision by using action alternatives that specifically address on-property disposal versus off-property disposal, with the understanding that (1) for both alternatives recycling and free release will be used when practical, (2) treatment will be used as necessary to meet criteria for disposal, whether on or off-site, and (3) for the on-site disposal alternative, materials that cannot be cost-effectively treated to meet on-site criteria for disposal will be sent to an off-site disposal facility. Criteria for on-site disposal are being developed by OU5 and will be used in the OU3 feasibility-study analysis.

Because it is proposed that no stand-alone OU3 baseline risk assessment be prepared, it is also proposed that risks associated with the no-action alternative be evaluated in the feasibility study. The risk evaluation will be semi-quantitative and will consider only direct radiation exposures to on-site workers and to a trespasser. Both short-term and long-term effectiveness will be evaluated assuming a hypothetical condition in which OU3 materials are in an interim-storage configuration on site. Evaluation of the no-action alternative is required by CERCLA, independent of DOE's commitment to prevent the permanent storage of materials resulting from the interim remedial action.

DOE proposes that the OU3 RI and FS reports be combined into a single, integrated document. Combining the documents will result in a smaller overall report, reduce overall preparation effort, and reduce the number of review cycles by DOE and EPAs.

Because of the limited scope of the final remedial action for OU3, no need exists for the screening of alternatives. The preliminary action alternatives will satisfy the screening criteria for effectiveness, implementability, and cost. Therefore, the preliminary and final alternatives will be the same. However, a need does exist for the screening of technologies that will be used in the evaluation of the action alternatives. Therefore, if a separate ISA report were prepared, it would consist only of the screening of technologies and the identification of alternatives. These tasks will be presented in the FS portion of the combined RI/FS report and a statement will be included indicating that such inclusion is intended to satisfy the requirement for an ISA report and is consistent with U. S. EPA's letter of January 6, 1994. Because of the proposed integration of the RI and FS reports into a single document and the resulting changes in the organization of the FS portion of the combined report, the screening of technologies would be provided in a section numbered differently than that identified in U. S. EPA's letter.

4.4 RECOMMENDATIONS RELATED TO REVISING THE OPERABLE UNIT 3 FEASIBILITY STUDY

Consistent with a desire to accelerate completion of the RI/FS process for OU3, DOE recommends that the RI and FS reports for the operable unit be combined into a single document.

Consistent with an approach that emphasizes meeting disposal and release criteria for the disposition of materials from OU3, DOE recommends that the preliminary action alternatives to be considered be (a) on-property and (b) off-property disposal as described in Section 4.3. Identification of the alternatives in this manner emphasizes the major decision to be made.

Consistent with the elimination of the OU3 baseline risk assessment as a stand-alone document, DOE recommends that the evaluation of risks associated with the no-action alternative be provided in the FS portion of the combined RI/FS report. Consistent with the understanding that implementation of a no-further-action final remedial alternative following the OU3 interim remedial action is unacceptable because it would result in contaminated structural materials remaining in temporary storage on site, DOE recommends that the analysis of the no-action alternative be based on an abbreviated, but conservative, semi-quantitative approach.

Consistent with the limited scope of the final remedial action for OU3, DOE recommends that the screening to be included in the FS portion of the combined RI/FS report to satisfy the requirements of the Amended Consent Agreement for an ISA report be a screening of technologies only.

5.0 REVISED OPERABLE UNIT 3 RI/FS SCHEDULE AND MILESTONES

5.1 INTRODUCTION

The purpose of this section is to provide the revised OU3 RI/FS schedule along with a discussion of the major assumptions utilized in developing the revised milestone dates.

It is assumed that an OU3 baseline risk assessment will not be developed for submittal within the OU3 RI Report. OU3 risk assessment information can be found in the OU3 Proposed Plan/Environmental Assessment for Interim Remedial Action and the Site-Wide Characterization Report. The IROD provides the decision to remove the buildings and structures and commits DOE to disposition all materials resulting from the interim action. It is assumed that the OU3 RI and FS reports were developed as a combined document. The OU3 draft RI/FS Report, along with the draft OU3 Proposed Plan, will be submitted to the U.S. EPA and the OEPA on September 11, 1995. The schedule outlined below for the ROD was developed based on the first EPA review of the combined RI/FS document being extended to 80 calendar days.

5.2 REVISED OPERABLE UNIT 3 RI/FS SCHEDULE

Milestone	Amended Consent Agreement Date	Revised Date
Draft OU3 RI to EPA	March 13, 1996	September 11, 1995
Draft OU3 FS to EPA	August 7, 1996	September 11, 1995
Draft PP to EPA	August 7, 1996	September 11, 1995
Draft OU3 ROD to EPA	April 2, 1997[1]	July 25, 1996

[1] As revised for the 1 month acceleration due to OU2 Dispute Resolution.

6.0 REFERENCES

(1) U.S. Department of Energy, 1993, Proposed Plan/Environmental Assessment for the Operable Unit 3 Interim Remedial Action, Fernald Environmental Management Project, Fernald, Ohio, Fernald Field Office.

(2) U. S. Department of Energy, 1993a, Operable Unit 3 Work Plan Addendum, Fernald Environmental Management Project, Fernald, Ohio, Remedial Investigation and Feasibility Study, Fernald Field Office.

(3) U. S. Department of Energy, 1992, Risk Assessment Work Plan Addendum, Fernald Environmental Management Project, Fernald, Ohio, Remedial Investigation and Feasibility Study, Fernald Field Office.

(4) U. S. Department of Energy, 1992a, Site-Wide Characterization Report and the Preliminary Site-Wide Baseline Risk Assessment (SWCR), Fernald Environmental Management Project, Fernald, Ohio, Remedial Investigation and Feasibility Study, Fernald Field Office.