4-402.4 1129

WORK PLAN FOR RECYCLING SUPPLEMENTAL ENVIRONMENTAL PROJECTS

DRAFT FINAL

DECEMBER 1997

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

Document No. 31748-WP-0001
Rev. B 12/9/97

000001

This page left intentionally blank.

WORK PLAN FOR RECYCLING SUPPLEMENTAL ENVIRONMENTAL PROJECTS
DRAFT FINAL
DECEMBER 1997

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

This page left intentionally blank.

WORK PLAN FOR RECYCLING SUPPLEMENTAL ENVIRONMENTAL PROJECTS

1.0 BACKGROUND

As part of a Dispute Resolution Agreement regarding Operable Unit 4 (OU4) milestones, the United States Environmental Protection Agency (U.S. EPA) and Department of Energy (DOE) have modified the Amended Consent Agreement (see Appendix A) to include the performance of five supplemental environmental projects (SEPs). The two recycling-oriented SEPs were described in the Dispute Resolution Agreement as:

> Project 4 (Railroad Track Recycling) — This proposal involves the size reduction, decontamination, and transport off-site for recycling and reuse of 300-500 tons of steel train track rails from the former process area. The monetary amount to be expended on this effort will be commensurate with the amount denoted for Project 4 in Paragraph 13 of the Dispute Resolution Agreement ($300,000). Steel train track rails will be removed from the former process area and decontaminated either through the on-site Fernald Environmental Management Project (FEMP) Material Release Facility (MRF) or through a private supplier of decontamination and recycling services. Based on the radiological characterization of the train rails, a wide variety of decontamination techniques may be appropriate, including manually operated abrasive blasting (such as vacuum grit blasting or sodium bicarbonate blasting), automated abrasive blasting (such as continuous feed descaling), or other less aggressive techniques.
>
> Project 5 (Structural Steel Debris Recycling) — This project involves the decontamination, transport, radiological surveying, and recycling and reuse of 300-500 tons of structural steel and/or oversized material (e.g., steel beams, steel mill rollers, mill stands, counterweights, large tanks or pressure vessels, etc.). The monetary amount to be expended on this effort will be commensurate with the amount denoted for Project 5 in Paragraph 13 of the Dispute Resolution Agreement ($275,000). These materials would be decontaminated and recycled through either the on-site FEMP MRF or through a private supplier of decontamination and recycling services. Based on the radiological characterization and the physical configuration of the materials, a wide variety of decontamination techniques may be appropriate, including manually operated abrasive blasting (such as vacuum grit blasting or sodium bicarbonate blasting), automated abrasive blasting (such as continuous feed descaling), or other less aggressive techniques.

The Dispute Resolution Agreement included the provision that DOE would provide to the EPAs a detailed work plan for each of these projects by September 15, 1997, identifying the specific decontamination/release strategy to be utilized, the specific material and tonnages included, and a project schedule for U.S. EPA review and approval, and Ohio EPA review. This document serves as a joint "detailed work plan" for Projects 4 and 5 and summarizes the project-specific design and field activities planned for these two recycling SEPs.

2.0 GENERAL APPROACH

Although the Dispute Resolution Agreement defines two separate recycling SEPs, the approaches to process the steel rail and the structural steel are similar, supporting a combined activity. Therefore, DOE proposes to perform the two recycling SEPs by combining them to recycle between 600 and 1,000 tons of railroad track, structural steel, and other metals from the FEMP. Specifically, this includes several metal streams, including, but not limited to: steel rail (including associated angle bars and tie plates); oversize debris and miscellaneous metal; and structural steel from completed and/or on-going decontamination and dismantlement (D&D) projects.

In general, the approach used to complete this project will be to:

- identify material streams that can be readily and cost-effectively decontaminated;
- initially characterize the metal to determine the extent of the contamination;
- request bids from off-site recycling vendors to decontaminate and release a material stream for unrestricted reuse;
- determine whether to decontaminate the metal using the on-site MRF or off-site recycling vendors;
- decontaminate the metal;
- verify the metal meets criteria for authorized release; and
- provide the released metal to a scrap dealer to salvage.

3.0 MATERIAL DESCRIPTIONS

As mentioned above, the various metal streams envisioned to be recycled and released for unrestricted reuse include, but may not be limited to: steel rail (including angle bars and tie plates); oversize debris and miscellaneous metal; and structural steel from completed and/or on-going D&D projects. The processing of these three streams as campaigns is discussed in the following subsections.

3.1 Campaign #1 - Steel Rail, Angle Bars, and Tie Plates

Existing original rail spurs at the FEMP encompass an estimated 5 miles (400 tons) of steel rail. New rail from the Operable Unit 1 (OU1) rail expansion project has not been included in this count. The bulk of the existing rail, which weighs 80-85 pounds per yard, was cast

between 1905 and 1920 and was installed at the FEMP in the early 1950s. A small segment of rail (approximately 230 yards) was added in the late 1980s during the construction of the Main Tank Farm; this rail weighs 132 pounds per yard.

The dismantlement of portions of existing site railroads is currently within the scope of three current projects: construction of the On-Site Disposal Facility (OSDF) Haul Road; the dismantlement of the Boiler Plant/Water Plant Complex; and the dismantlement of the Thorium/Plant 9 Complex. The rail within the scope of these three projects comprises approximately 180 tons of the estimated 400 tons of existing site railroads. The removal of the 180 tons of rail is governed under the corresponding EPA-approved project-specific implementation plans, which are consistent with the strategies and D&D specifications outlined in the Operable Unit 3 (OU3) Integrated Remedial Design/Remedial Action (RD/RA) Work Plan.

The removal of the additional 220 tons of rail will be accelerated from out-year D&D projects (primarily Plant 1- Phase II Complex) and will be performed either under a contract modification to an existing FEMP subcontractor or under a separate subcontract. The removal of the additional steel rail will also be performed using the strategies and D&D specifications outlined in the OU3 Integrated RD/RA Work Plan. However, due to the minor size of this activity, no specific implementation plan will be generated for this sub-project. The colored z-fold map (Figure 1) shows the rail that is associated with each project.

Additionally, there are an estimated 130 tons of angle bars (i.e., splice plates) and tie plates that will be decontaminated and released. Size reduction of the rail and angle bars will be performed in situ by the D&D subcontractor. Since the D&D specifications are performance-based, the D&D subcontractor may select (with DOE approval) his preferred size reduction technique (e.g., torch-cutting, shearing, etc.). Due to the age of this rail and the light load limits associated with it, the rail and angle bars (once released) will be sold as scrap metal. The tie plates will be released and offered to rail firms for potential re-use. If no interest is expressed in this metal, it also will be sold as scrap metal.

3.2 Campaign #2 - Oversize Debris and Miscellaneous Metal

There were several different metal forms generated during D&D projects that are, perhaps, the most amenable to recycling because they have low surface area to mass ratios. Some of

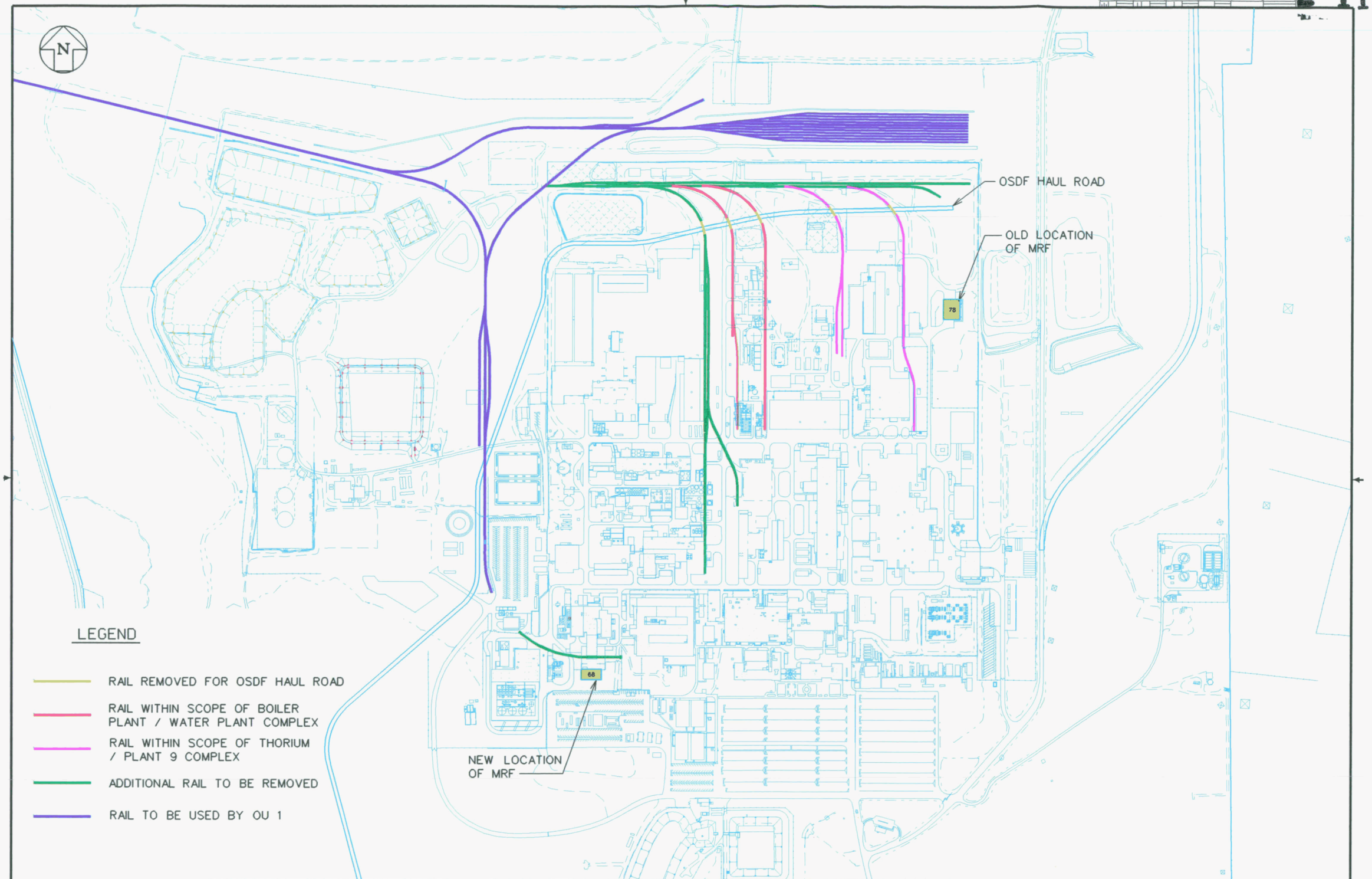
these metal forms do not currently meet the general operations size criteria of the OSDF and are, therefore, considered oversize debris. Also, the metal forms that are predominantly lead do not meet the chemical waste acceptance criteria of the OSDF. To date, approximately 40 tons of these large steel and lead metal forms have been generated. Examples include elevator counterweights from Building 4A (i.e., Plant 4), counterweights from scrapped fork-lifts and hand-stackers, and excessed weights that were once used to calibrate and balance scales.

It should be noted that during the planning of this project and the development of this work plan, emphasis was placed on investigating the feasibility of recycling as much oversize debris as possible in order to minimize the quantity of oversize debris that is potentially proposed for dispositioning in the OSDF. The Plant 6 Rolling Mill rolls and frames, for example, were specifically studied to determine if they could be physically removed from Plant 6 by Safe Shutdown personnel, since the D&D of Plant 6 is not scheduled until 2000 and 2001. Unfortunately, significant amounts of ancillary equipment would have to be removed from the north end of the building in order for heavy equipment to gain access to the rolling mills. This approach would significantly increase the cost for removal compared to performing this work as part of a typical D&D project. DOE will continue to focus on incorporating other oversize debris possibilities into these SEPs as the project progresses. Therefore, there is a potential that the quantity of this material stream may increase as other pieces of potentially oversized debris are identified and become available to recycle under these SEPs.

3.3 Campaign #3 - Structural Steel

Structural steel, which is largely comprised of I-beams, C-channels, and angle iron will be available from Plant 4, Plant 1, Boiler Plant/Water Plant, and/or the Tank Farm Complex D&D projects. These metals possess a relatively high surface area to mass ratio. Structural steel from Plant 4, Plant 1, and the Boiler Plant/Water Plant Complexes have two to four coats of paint that must be removed in order to ensure surface limits of the authorized release criteria are met, while tank farm steel, having only been painted once, is expected to be releasable as is. For these reasons, decontamination and unrestricted release of structural steel will have the highest processing cost per recycled ton of the four material streams discussed.

Since structural steel is planned as the last campaign of this project, whatever funds remain after processing the first two campaigns will be used to recycle as much structural steel as possible. Based on cost estimates, which are discussed later in this work plan, the remaining



LEGEND

- RAIL REMOVED FOR OSDF HAUL ROAD
- RAIL WITHIN SCOPE OF BOILER PLANT / WATER PLANT COMPLEX
- RAIL WITHIN SCOPE OF THORIUM / PLANT 9 COMPLEX
- ADDITIONAL RAIL TO BE REMOVED
- RAIL TO BE USED BY OU 1

NO.	REVISIONS	DATE	DWN. BY	APPD.	NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING — SYSTEM, STRUCTURE OR COMPONENT SHOWN ON THIS DRAWING ARE UNDER CONFIGURATION MANAGEMENT CONTROL. SEE NOTES.

COGNIZANT ENGINEER DATE

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		FIRE PROTECT.	
INSTRUMENT		WASTE MANAGE.	
MECHANICAL		SECURITY	
CHECKED		ORU	
APPROVED			

U.S. DEPARTMENT OF ENERGY

PROPOSED / EXISTING MRF LOCATION AND R. R. SPURS

OVERALL PLAN

RES. 2567/F099 TASK 14
DATE 9-25-97
DRAWN WEOK LAU

24X-5500-X-00107 | 0

FILE NAME: /usr2/aegroups/model/24x00107.dgn

FORMAT REVISED 11/5/98 FGFS.DGN

funds could allow for the processing of as much as 205 tons. This assumes that all surfaces of the steel are accessible for decontamination and authorized release surveying after demolition and shearing. The cost for recycling structural steel may increase significantly if ends are crimped and must be removed. Any crimped ends or other inaccessible metal will be returned to the originating structural steel stockpile to await disposition in the OSDF.

Also, as noted above, the quantity of oversize debris available for recycling may increase, which would decrease the availability of remaining funds for structural steel, trading steel that is more costly to process per ton for larger volume metal.

4.0 METAL DECONTAMINATION AT THE MATERIAL RELEASE FACILITY

The FEMP MRF is designed to be a centralized facility where materials destined for reuse or recycling can be decontaminated and released. The MRF utilizes a vacuum grit blasting decontamination process (described below) and simple high pressure detergent spray washing to decontaminate a wide variety of different material types. The MRF has operated successfully in a pilot project which lasted for two months. During that time, processes were refined, equipment was tested and adjusted, and personnel were trained.

The MRF will be available to process materials in support of these SEPs after February 1998, once the facility has completed its relocation to a building which will better meet its long-term needs. The MRF is currently located within the Thorium/Plant 9 Complex, but will move its operations from Building 78 to Building 68, in order to support the current schedule for the dismantlement of the Thorium/Plant 9 Complex. Also, to support the processing of the three large campaigns included in the SEPs, the facility's compressed air supply will be upgraded.

The FEMP vacuum grit blaster is manufactured by LTC Americas, and is unique because of the integral vacuum feature. The system utilizes HG40 steel grit as a blast medium. The grit is propelled by 650-700 cfm of 125 psig compressed air. The vacuum system draws the used grit and contaminants back through a vacuum line, through a separator system that recycles the steel grit by separating the grit from the lighter contaminants, and filters the contaminants out of the air using a high-efficiency particulate air (HEPA) filtration system. The contaminants and non-recyclable grit are then removed from the HEPA prefilters using a vibration system and finally contained in a 30-gallon drum.

Once a 30-gallon drum is filled, the containerized grit blast material will be sampled and characterized for Toxicity Characteristic Leachate Procedure (TCLP) metals. If the grit blast is characterized as Resource Conservation and Recovery Act (RCRA)-hazardous low-level waste, the grit blast waste will be stabilized by a process similar to the neutralization, precipitation, deactivation, and stabilization process. The resulting stabilized waste will be re-sampled and characterized for TCLP metals, as well as for the radiological characterization requirements of the NTS. After stabilization and re-sampling, if the TCLP results indicate that the material should remain characterized as a RCRA hazardous waste, it will be reprocessed until it does not exceed the TCLP limits. Once the TCLP results indicate that the material no longer exhibits the characteristics of a RCRA hazardous waste, the material will be prepared and shipped to the Nevada Test Site (NTS) in accordance with site procedures for packaging, labeling, loading, and transporting low-level wastes to NTS.

5.0 RECYCLING THROUGH BASIC ORDERING AGREEMENTS

An alternative to the use of the FEMP MRF is the beneficial reuse or decontamination and authorized release of metal using off-site recycling vendors. These vendors have already been prequalified by DOE using a basic ordering agreement (BOA) approach to contracting. Under this approach, for each discrete stream of metal to be recycled, a task order will be written and submitted to the prequalified vendors for bids. All vendor bids will then be evaluated (see Section 5.1) and, if the best bid is preferential to processing the metal through the FEMP MRF, the task order will be placed with the selected vendor.

Generally, the metal will be packaged for shipment to the vendor's facility, where the vendor will either beneficially reuse the contaminated metal or will decontaminate the metal to meet authorized release standards applicable under the vendor's respective license and will sell the metal as scrap. Any secondary waste will be dispositioned directly to the appropriate disposal facility from the vendor's decontamination facility.

5.1 Evaluation of Vendor Bids

Once vendor bids have been received for a specific task order, DOE will compare the total and complete cost associated with the two options (i.e., off-site recycling vendor and FEMP MRF vacuum grit blaster). For example, the total and complete cost associated with the unrestricted release (or restricted reuse/recycle) of metal using a BOA vendor would include costs associated with:

- the preparation and maintenance of the BOA task order (i.e., vendor contract);
- the generation and size reduction of the metal (if necessary);
- the packaging and transportation of the metal to the vendor's recycling facility;
- the value of the BOA task order; and
- the treatment and disposition of secondary wastes.

In contrast, the total and complete cost associated with the recycle and unrestricted release of metal through the FEMP MRF would include costs associated with:

- the generation and size reduction of the metal (if necessary);
- the on-site transportation of the metal from the point of generation (or interim storage) to the FEMP MRF;
- the labor and materials required to vacuum grit blast the metal until unrestricted release standards can be met;
- the labor and materials required to demonstrate that unrestricted release standards have been met;
- the sale of the unrestricted release metal to a scrap metal dealer; and
- the treatment and disposition of secondary wastes.

Ordinarily, the return from the sale of the scrap metal is sent to the U.S. Treasury. Therefore, these funds cannot be directly reapplied to further remediation efforts at the FEMP. However, if the two recycling options (off-site vendor vs. MRF) offer a difference in the sale value of the metal, the return from the metal sale will also be included in the cost comparison of the options.

6.0 CRITERIA FOR AUTHORIZED RELEASE

Materials evaluated during project design for restricted and unrestricted release will be based on process knowledge, OU3 remedial investigation sampling data, and current radiological surveys. Further evaluation will be conducted in the field to certify eligibility for unrestricted release per the criteria and testing established in the Certification Program for Release of Materials from the FEMP, which currently consists of the Site Procedure RP-0009 (see Appendix C) and the revised draft of the FEMP Material Release Policy. The strategy for qualifying materials for both restricted and unrestricted release, including recycling, or reuse, involves the certification process described in Site Procedure RP-0009, which was developed

to fulfill the requirements of the FEMP Material Release Policy and DOE Order 5400.5 (titled "Radiation Protection of the Public and the Environment").

When the FEMP Material Release Policy has been finalized, the criteria in that document will be complied with in lieu of the revised draft. If any significant change to either the FEMP Material Release Policy or Site Procedure RP-0009 is made, DOE will notify the EPAs prior to incorporation of those changes into SEP activities.

The degree of effort required to certify material for unrestricted release is largely dependent upon the physical properties of the material. Physical properties of the material refers to the porosity of the potentially contaminated surface of the material, accessibility of the surfaces for survey, and the physical state of the material (i.e., liquid vs. solid).

Surfaces of the metal will be surveyed using standard survey techniques applying the surface contamination release limits of DOE Order 5400.5, as shown in Table 1. Inaccessible areas of the metal to be released will be evaluated on a case-by-case basis using available process knowledge and sampling data. Inaccessible areas that are potentially contaminated will be assumed to exceed the limits for unrestricted release unless the metal is disassembled allowing access for survey or special survey techniques are employed that support the rationale that contamination of the inaccessible areas does not exceed the surface contamination release limits of DOE Order 5400.5.

TABLE 1 Surface Contamination Guidelines

Radionuclides[2]	Allowable Total Residual Surface Contamination (dpm/100 cm^2)[1]		
	Average[3][4]	Maximum[4][5]	Removable[4][6]
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231	reserved	reserved	reserved
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-224, U-232, Th-232	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay product, alpha emitters	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above[7]	5,000	15,000	1,000

Footnotes for Table 1 (Surface Contamination Guidelines):

(1) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(2) Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

(3) Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such subject.

(4) The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

(5) The maximum contamination level applies to an area of not more than 100 cm^2.

(6) The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

(7) This category of radionuclides includes mixed fission products, including the Sr-90 which is present in them. It does not apply to Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

7.0 PROJECT COSTS

As provided in the referenced Dispute Resolution Agreement (see Attachment B of Appendix A), funding of this combined project should be commensurate with the stipulated amounts provided in Paragraph 13 of the Dispute Resolution Agreement; these include $300,000 for Project 4 (Railroad Track Recycling) and $275,000 for Project 5 (Structural Steel Debris Recycling). The primary objective of these two SEPs is to recycle as much metal as possible for the combined value of the projects ($575,000).

Table 2 identifies estimated project costs for decontaminating and releasing the identified types and quantities of metals discussed in Section 3. The estimates for metal processing are based on the assumption that a crew of three decontamination workers, two radiation control technicians, a fork lift driver, and a supervisor can decontaminate (using the FEMP MRF vacuum grit blaster) and perform free-release surveys on approximately 200 linear feet of rail per day or 180 square feet of I-beam surface area per day.

For the purposes of estimating, decontamination workers are assumed to be wearing Level C personal protective equipment (which may change depending on the level of contamination of the metal and the observed conditions within the MRF building once processing begins). Secondary wastes are estimated to be generated at a rate of one 30-gallon drum per month.

There is also an allowance of $1,000 per month for blasting media and other consumables necessary to operate the vacuum grit blaster and air compressor.

It is important to note that these are rough estimates based on limited experience processing materials through the FEMP MRF. Also, since the estimates are based on MRF experience, they may not reflect BOA costs and production rates as accurately. Actual project costs may differ significantly from the estimates shown in Table 2, and will be documented in the project completion report.

Since the SEPs are intended to be additional work beyond what has been previously scoped within the baseline for site remediation, project costs will be tracked separately from other D&D and waste management activities and no baseline activities will be charged to the SEP account. Once stipulated values ($575,000) have been expended from this account, the requirements of the SEP will be considered satisfied, even though additional recycling may be completed beyond the funds specified.

TABLE 2 Estimated Project Costs

Activity/Material	Estimated Quantity [a]	Estimated MRF Cost
Planning and Work Plan Development	N/A	$20,000
Upgrade MRF Compressor	N/A	$ 55,000
Steel Rail, Angle Bars, and Tie Plates	530 tons	$ 186,000
Oversize Debris and Miscellaneous Metal	40 tons	$ 44,000
Structural Steel	205 tons	$ 205,000 [b]
Secondary Waste Treatment and Disposal	N/A	$ 50,000
Project Closeout	N/A	$ 15,000
Total	775 tons	$ 575,000

a Reflect estimated quantities given specified expenditure levels. The estimated quantities do not reflect required tonnage to be recycled.

b The cost to process the structural steel assumes that all surfaces of the steel are accessible for decontamination and authorized release surveying after demolition and shearing. Recycling costs would be greater for any steel that requires removal of inaccessible areas (e.g., crimped ends).

8.0 PROJECT SCHEDULE

The currently anticipated project schedule for the recycling SEPs, which is provided in Figure 2, includes activities related to project planning, relocation of the MRF, generation of material streams, decontamination of those streams, and project closeout. The schedule also identifies four milestones for the SEPs, which are considered enforceable commitments. These four milestones are:

- submittal of the draft work plan by September 15, 1997;
- initiation of metal processing by March 31, 1998;
- completion of metal processing by February 27, 1999; and
- submittal of a draft project completion report within 60 calendar days following completion of metal processing.

Note that "completion of metal processing," as discussed in Section 7.0, occurs when the cost to decontaminate and release metals (either using the MRF or the BOAs or both) exceeds the $575,000 funding objective. All other activities included within the schedule in Figure 2 are provided for information only and are not considered enforceable milestones.

9.0 PROJECT COMPLETION REPORT

Within sixty days from the completion of metal processing and releasing of the metal to the scrap dealers, a project completion report will be submitted to the regulatory agencies for review and approval. The project completion report will be similar to those submitted as part of D&D project deliverables and will include the following project-specific information:

- reiteration of metal processing activities discussed in this work plan;
- explanations of any modification to this work plan and the reasons why there were necessary for the project;
- description of any alternative technologies used or evaluated during the project;
- identification of types and quantities of metals processed and released;
- identification of types and quantities of secondary wastes generated;
- a summary of actual project costs incurred during the execution of these SEPs, including processing rates; and
- A discussion regarding the incorporation of processing data into the Decision Methodology for Fernald Material Disposition Alternatives.

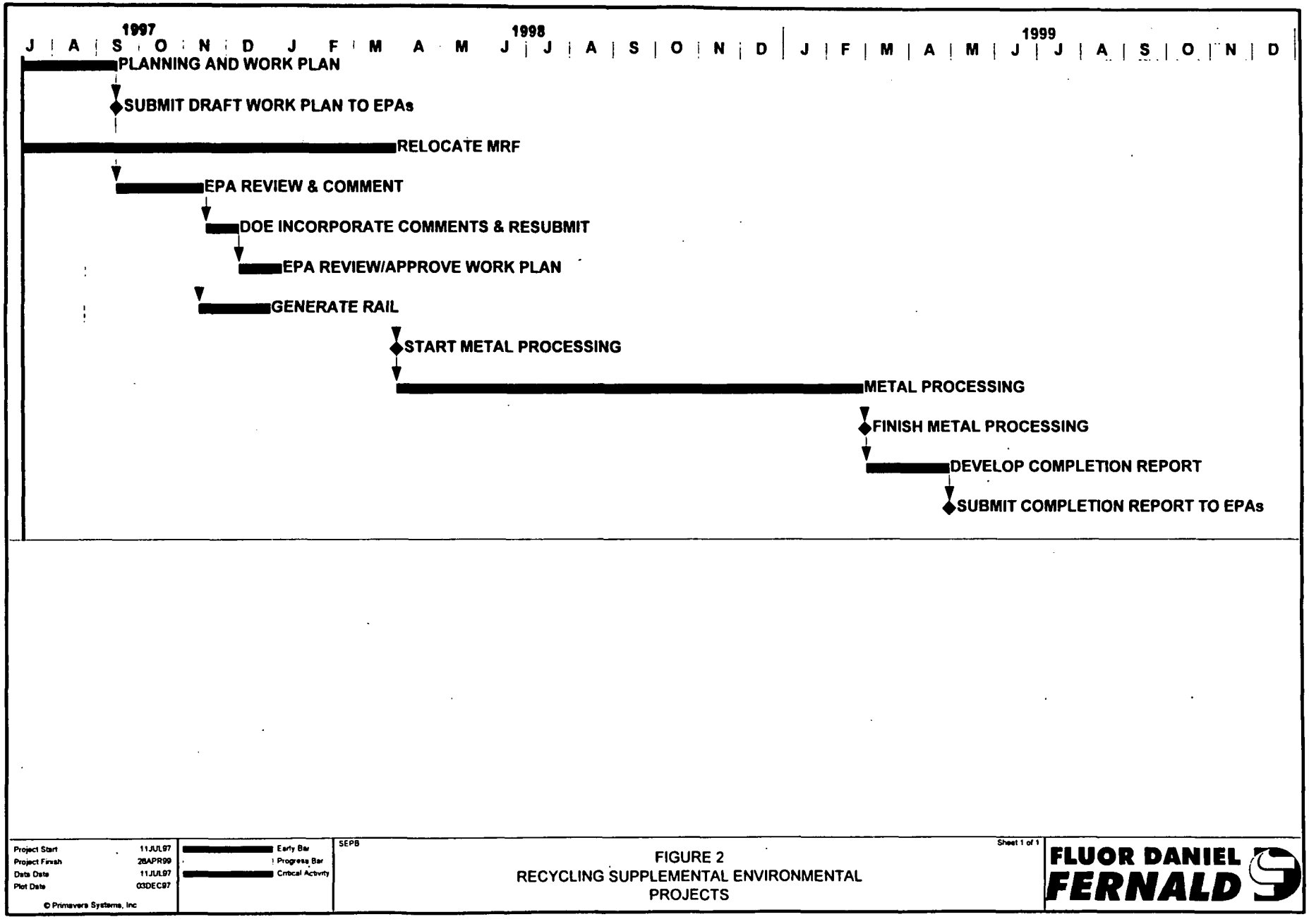


FIGURE 2
RECYCLING SUPPLEMENTAL ENVIRONMENTAL PROJECTS

FLUOR DANIEL FERNALD

Appendix A

Operable Unit 4 Dispute Resolution Agreement and SEP Definition

This page left intentionally blank.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF:	)	
	)	
U.S. DEPARTMENT OF ENERGY	)	Administrative
FEED MATERIALS PRODUCTION CENTER	)	Docket Number: V-W-90-C-057
	)	
FERNALD, OHIO	)	
	)	
OH6 890 008 976	)	

AGREEMENT RESOLVING DISPUTE CONCERNING DENIAL OF REQUEST FOR EXTENSION OF TIME FOR CERTAIN OPERABLE UNIT 4 MILESTONES

On the basis of the facts set forth below and in accordance with Sections XIV, XVII, and XXXIII of the September 1991 Amended Consent Agreement ("ACA"), the United States Department of Energy ("U.S. DOE") and the United States Environmental Protection Agency ("U.S. EPA") hereby agree to resolve all disputed matters relating to U.S. EPA's denial of U.S. DOE's September 26, 1996, request for an extension of time for certain Operable Unit 4 ("OU 4") milestones.

BACKGROUND

1. On November 3, 1995, U.S. DOE informed U.S. EPA that an evaluation of the Vitrification Pilot Plant ("VITPP") schedule indicated that schedule slippages would occur to the Fernald Residues Vitrification Plant.

2. During the period from January 1996 through the date of this Agreement, U.S. DOE has conducted weekly telephone conferences with U.S. DOE's Prime Contractor for the Fernald Environmental Management Project ("FEMP"), U.S. EPA, and Ohio EPA in order to provide status updates and to seek regulatory input and guidance.

3. On September 26, 1996, U.S. DOE requested an extension of time under Section XVIII of the ACA to meet the initial OU 4 regulatory milestones associated with the full scale vitrification facility identified in the Remedial Design ("RD") and Phase I Remedial Action ("RA") Work Plans.

4. On October 2, 1996, U.S. EPA notified U.S. DOE of its denial of the September 26, 1996, extension request and its intent to assess stipulated penalties under the ACA.

5. On October 9, 1996, U.S. DOE and U.S. EPA entered into an Agreement to suspend the ACA time periods for initiation of the Formal Dispute Resolution Process until May 15, 1997 ("the October 9, 1996, Agreement"), while continuing to engage in Informal Dispute Resolution.

6. On May 15, 1997, U.S. DOE and U.S. EPA entered into an Agreement in Principle to resolve this dispute which tolled the assessment of stipulated penalties provided all disputed matters were formally resolved by no later than July 14, 1997.

7. Pursuant to the October 9, 1996, Agreement and the May 15, 1997, Agreement in Principle, U.S. DOE and U.S. EPA met to discuss the path forward on dispute resolution on October 30, 1996, January 14, 1997, February 19, 1997, March 24, 1997, April 16, 1997, April 29, 1997, June 16, 1997, and June 23, 1997 in addition to participating in the weekly telephone conferences.

8. During the Informal Dispute Resolution, the Fernald Citizen's Task Force ("FCTF") reviewed the issues with OU 4 and reported its initial recommendations to the U.S. DOE, U.S. EPA, and the Ohio EPA on March 15, 1997. An Independent Technical Review Team ("IRT") was also convened to examine issues associated with remediation of the Silos' contents. The IRT reported its findings and conclusions on April 28, 1997.

9. The Parties agree that U.S. EPA will provide public notice and a thirty (30) day public comment period and conduct a public meeting to accept public comments on this Agreement. The parties agree to review any public comments and revise this Agreement as appropriate.

10. Throughout this dispute, the Parties have consulted with, and accepted input from, the Ohio Environmental Protection Agency.

11. Pursuant to Section XXXIII of the ACA, the ACA may be modified upon written consent of the Parties.

GOOD FAITH

12. Among other factors, U.S. EPA's assent to the terms of this Agreement, including the penalty provisions, is based upon U.S. DOE's demonstration of good faith in resolving this matter.

Specific instances of U.S. DOE good faith include, but are not limited to, the following:

a. Establishment of the IRT composed of nationally and internationally recognized experts in vitrification and stabilization technologies to evaluate and provide recommendations on the OU 4 Remedial Action;

b. Development of "Value-Engineering" studies that will be an overall evaluation process of OU 4, including the path forward and cost estimates;

c. Development, preparation, and, as described in Attachment A hereto, implementation of a "Lessons Learned" document from OU 4;

d. Participation in weekly conference calls and other settlement conferences;

e. Public participation efforts with the FCTF and the IRT on the OU 4 technical issues;

f. Establishment and documentation of reviews relating to the December 1996 melter incident. The review teams included nationally recognized experts from the vitrification industry; and

g. Agreement to implement, in accordance with Attachment B hereto, projects which will prevent pollution and enhance, restore or maintain the quality of an environmental resource in or near the FEMP.

h. Cooperation in resolving this matter within the informal dispute resolution period.

i. U.S. DOE's commitment to continue to investigate and maintain the integrity of the silos, and monitor and minimize radon emissions from the silos.

TERMS OF RESOLUTION

In order to resolve this dispute, and to concentrate the Parties' efforts on environmental restoration activities at the FEMP, U.S. DOE and U.S. EPA agree as follows:

13. U.S. DOE agrees to implement, in accordance with the specified work plans and schedules, the projects described in Attachment B to this Agreement. If U.S. DOE fails to meet any project schedule or otherwise implement these projects, U.S. DOE

agrees that U.S. EPA may assess a stipulated penalty up to the following negotiated amounts:

Project One.	.$200,000
Project Two.	.$100,000
Project Three.	.$100,000
Project Four	.$300,000
Project Five	.$275,000

At its sole discretion, U.S. EPA may accept a U.S. DOE proposed alternative or modified project in lieu of assessing an additional monetary penalty. Assessment of a stipulated penalty pursuant to this provision, or approval of an alternative or modified project, shall satisfy DOE's obligation to complete performance of the original project. Any penalty assessed under this paragraph shall be paid from funds specifically authorized and appropriated for that purpose in accordance with Section XVII of the ACA. U.S. DOE expressly waives any right to invoke dispute resolution or in any other way contest the assessment of a monetary penalty under this paragraph.

14. U.S. DOE agrees to the assessment of a monetary penalty in the amount of $100,000, to be paid from funds specifically authorized and appropriated for that purpose in accordance with Section XVII of the ACA.

15. U.S. DOE agrees to request funds in its Fiscal Year (FY) 1999 budget request for the monetary penalty assessed in paragraph 14 of this Agreement. In the event U.S. EPA assesses an additional monetary penalty pursuant to paragraph 13, U.S. DOE agrees to request funds for such a penalty in the first available FY budget cycle, but no later than 24 months, following the U.S. EPA assessment. In accordance with Section XVII.C. of the ACA, U.S. DOE shall make any penalty payments payable to the Hazardous Substances Response Trust Fund and remit such payments within ninety (90) days of receiving authorization to spend funds appropriated for the penalty payments to:

Hazardous Substances Response Trust Fund
P.O. Box 70753
Chicago, IL 60673

Or, if sent by overnight mail service:

First National Bank
525 West Monroe Street

7th Floor Mailroom
Chicago, IL 60661

Any penalty payments made under this agreement should include a reference to the DOE - Fernald Site. Copies of such payments shall be mailed to:

Superfund Division
Federal Facilities Section
SRF-5J
77 West Jackson Blvd.
Chicago, IL 60604

ATTN: James Saric

16. Pursuant to Section XII of the ACA, a primary report submitted pursuant to the ACA may be modified upon consensus by the Project Managers on the need for modification. The Parties agree that the letter from J. Saric to J. Reising, "OU 4 Post-ROD Changes", dated May 21, 1997, constituted the concise written request for modification in compliance with Section XII J.1. of the ACA. The Parties further agree that the need exists for the modification of the OU 4 Feasibility Study/Proposed Plan and Remedial Design/Remedial Action Work Plans and the reports submitted thereunder.

17. This Agreement shall modify Section X, paragraph C.4. of the ACA by requiring the submittal of additional OU 4 documents pursuant to the following schedules:

Activity	Due Date
Submit Draft Explanation of Significant Differences (ESD) for Silo 3 to U.S. EPA for review, comment, and approval.	September 15, 1997
Award multi-tech proof of principle contract for Silos 1 and 2.	August 10, 1998
Submit Draft Supplemental Feasibility Study/Proposed Plan (FS/PP) to U.S. EPA for review, comment, and approval.	February 1, 2000
Submit Draft Record of Decision (ROD) Amendment for Silos 1 and 2 to U.S. EPA for review, comment, and approval.	December 29, 2000

18. As a result of, and in consideration for, DOE's agreement to prepare an ESD for Silo 3, and award a multi-tech proof of principle contract, submit a supplemental FS/PP and amend the OU 4 ROD for Silos 1 and 2, the Parties agree that the current schedules contained in the RD/RA work plans submitted pursuant to the approved OU 4 ROD are no longer effective. A replacement RD/RA Work Plan will be developed for Silo 3 within 60 days of the finalization of the ESD. A replacement RD/RA Work Plan will be developed for Silos 1 and 2 within 60 days of finalization of the ROD amendment. The Parties agree that the time frames and procedures for review and approval of documents submitted pursuant to paragraph 17, as well as submission of other necessary and related documents such as a draft Amended RD/RA Work Plan, shall be determined in accordance with Sections XI and XII of the ACA.

19. In order to incorporate into the ACA the ESD for Silo 3, and the award of the multi-tech proof of principle contract, supplemental FS/PP and ROD amendment for Silos 1 and 2, the Parties have revised page 36 and added page 36a of the ACA which are attached hereto as Attachment C.

20. In the event U.S. DOE fails to comply with any term of this Agreement, except for those activities described in Attachment B hereto, U.S. EPA reserves the right to pursue any remedies it may have available to it under the ACA or the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601, et seq. In the event U.S. DOE fails to implement any of those activities described in Attachment B hereto, U.S. EPA shall have available to it the remedies specified in Paragraph 13.

21. U.S. DOE agrees not to further dispute the U.S. EPA October 2, 1996 "good cause" determination in any proceeding by U.S. EPA to enforce the terms of this Agreement.

22. The Parties agree that this Agreement resolves all disputed matters relating to U.S. EPA's denial of U.S. DOE's September 26, 1996, request for an extension of time for certain Operable Unit 4 ("OU 4") milestones.

23. No provision of this Agreement shall be interpreted to require obligation or payment of funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341.

24. Nothing in this Agreement or in the ACA shall be interpreted or construed as an admission of liability by U.S. DOE.

25. U.S. DOE and U.S. EPA individually certify that the signatories to this Agreement have the authority to bind U.S. DOE and U.S. EPA to the requirements of this Agreement.

IT IS SO AGREED:

By: Robert Folker Date: 7-14-97
Robert Folker, Acting Manager
U.S. Department of Energy
Ohio Field Office

By: William E. Muno Date: 7/22/97
William E. Muno, Director
Superfund Division
U.S. Environmental Protection Agency
Region V

This page left intentionally blank.

ATTACHMENT A

SILOS PROJECT LESSONS LEARNED

Throughout the planning and implementation of Silos Project activities, primarily those involved with design, construction and operation of the Vitrification Pilot Plant, lessons learned have been collected from a variety of internal and external sources. The primary purpose of operating a pilot plant facility is the generation of lessons learned to guide subsequent design and operation of the full scale facility. Sources of lessons learned have included design and readiness reviews, investigations by the three review teams convened to study the December 26, 1996 melter incident, and other formal and informal input from personnel involved in the project. Lessons learned input has also been collected from a variety of external sources including FEMP stakeholders and the Silos Project Independent Review Team.

A detailed database is maintained including each specific lesson learned and its source, the person responsible for addressing the item, and ultimately a summary of the disposition of the item. This database is continually updated and is included as an appendix in the Interim Treatability Study Reports prepared and submitted to DOE, USEPA, and OEPA for each Pilot Plant Campaign.

The Vitrification Pilot Plant Lessons Learned database currently contains 237 individual lessons learned. A large number of specific operational and design items were identified with specific applicability to design and operation of the full scale vitrification facility. During the initial campaigns of Phase I, immediate equipment modifications or operational changes were often implemented to provide near-term resolution of problems and improve subsequent Pilot Plant operations. More significantly, lessons learned during Pilot Plant operations will form a major basis for design of the full-scale vitrification facility. Many of these vitrification lessons learned will also be applicable to the Silo 3 Solidification Project and, if the path forward for Silo 1 and 2 remediation were to change, to implementation of an alternate stabilization technology for the K-65 residues.

One of the primary lessons learned from the experience to date in the Silos Project is the benefit of a disciplined approach to project management, including as a key factor the direct incorporation of lessons learned into design, operational, and other project decisions. The project has been, and will continue to be staffed with experienced project and operations managers and engineering personnel. As evidenced by efforts such as the Independent Review Team and the three Melter Incident Review Teams, the project has made beneficial use of outside expertise to aid in key decisions. The organization of the Silos Project has been restructured in preparation for implementation of the path forward for remediation of the K-65 and Silo 3 residues. Engineering, project management and operational expertise from within the Silos project and from other successful design and waste treatment projects has been utilized in forming project teams to focus the necessary expertise upon each major facet of the path forward . These teams will continue to utilize outside industry expertise in designing and implementing treatment of the K-65 and Silo 3 residues. Factors such as demonstrated discipline in project management and technical expertise in similar treatment technologies will be major factors in selection of vendors for Silos Project remediation activities.

Many of the lessons learned accumulated during design, construction, and operation of the Vitrification Pilot Plant will also be applied in planning and implementation of other waste treatment and remediation projects at the FEMP. In addition to the need to maintain a disciplined approach to project management, lessons applicable to future projects include the need for early comprehensive identification of requirements, continuity of engineering staff through all phases of the project, and integration between personnel responsible for design of process and ancillary equipment, will be applied to future projects. The Silos Project lessons learned database, as well as the FEMP-wide DOE complex-wide lessons learned databases will continue to be utilized in planning and implementation of FEMP remedial activities.

LESSONS APPLICABLE TO VITRIFICATION ACTIVITIES

Identified below are examples, consolidated from a large number of more specific detailed items, of major vitrification-specific lessons learned from Phase I operation of the Pilot Plant. Although lessons learned played a key role in identifying operational and design changes during Phase I to improve operation in later Phase I campaigns, the ultimate resolution of these operational lessons learned will be achieved through design of the full-scale vitrification facility. Phase I lessons learned, including those identified in the Melter Incident Final Report, will form a primary basis for design of the full-scale facility.

- The combination of high temperature and high concentrations of sulfate and lead in the silo residues make high temperature operation of a three chamber melter for processing of silo residues problematic. The Melter Incident Final Report recommends that the final design 'consider alternate melter design(i.e., gas, low-temperature, electrical)'

  In designing the full-scale facility, consideration will be given to a variety of measures, including lower temperature operation, reduced waste loading and different materials of construction. The full-scale facility will likely not utilize a three chamber melter.

- Presence of sulfates results in foaming and in formation of a molten sulfate layer on the surface of the glass. This situation increases melter power requirements.

  Use of urea to reduce sulfates was identified for implementation in subsequent Pilot Plant operation. In design of the full-scale melter, consideration will be given to providing higher retention times and/or more power input to provide for destruction of sulfates. The problems caused by sulfates played a major role in the recommendation not to vitrify Silo 3 residues.

- Numerous bends and small size of piping, inadequate pump design, and interaction between additives, all contribute to frequent plugging of the melter feed system.

  The experience gained in resolving these problems with the Pilot Plant feed system will be incorporated into the design of the feed system for the full-scale vitrification facility, as well as design of waste retrieval and other material handling systems involved in silos remediation.

- High particulate loading downstream of the scrubber, along with long piping runs and

numerous bends contributed to insufficient capacity in the off gas system. The desiccant tower did not provide sufficient removal of moisture from the off gas, resulting in high moisture loading to the HEPA and prefilter.

Many modifications, including spray nozzles upstream of the quench tower and above the scrubber, and heat tracing / insulation of the off gas system were implemented prior to Campaign 4 to remedy this problem.

Design of the full-scale vitrification facility will include a complete rework of the off-gas system. This design will incorporate features such as maintaining higher temperature through the filters, increased blower capacity, use of a chiller and other enhanced moisture removal capacity, and location of equipment to shorten and simplify piping runs in response to lessons learned from pilot plant operation.

- Frequent plugging of the gem machine - In design of the full-scale facility, consideration will be given to use of a water cooled cutter, graphite lining, or switch to an alternate waste form.

- Bottom Drain leaking and 'glow events' - In designing the full scale facility, consideration will be given to deletion of the inner glass containment shell and all bottom penetrations.

LESSONS APPLICABLE TO OTHER FEMP PROJECTS

In addition to lessons implemented to improve subsequent silos vitrification activities, a wide variety of technical, operational, and project management lessons have been accumulated from design, construction, and operation of the Vitrification Pilot Plant which will be applied to other projects at the FEMP.

Project Management

- Expertise developed in implementation of successful engineering, waste management, and operations efforts at the FEMP, as well as outside industry expertise should be utilized in evaluating and resolving technical or design issues, assessing operational problems and making strategic path-forward decisions.

- Project organizational structure should include an outside technical review by industry experts.

- Managers, engineers, operators, and maintenance personnel should be trained by experts in design, operation, and any unique phenomena associated with key equipment.

As has been done to date in the Silos Project, engineering, project management and operational expertise from successful design, operations and waste management projects will be utilized to form project teams to focus the necessary expertise upon implementation of key remedial projects. These teams will continue to utilize outside industry expertise and place emphasis on discipline in project management, and demonstrated technical expertise in selecting vendors for implementing these projects.

Incorporation of Lessons Learned into Project Execution

- A detailed database of lessons learned should be maintained from the inception of the project to provide a resource for improving subsequent stages of the project. The Melter Incident Final report identified that although concerns with bubbler tube erosion had been raised during initial project evaluations, concern was not carried forward into the Final Hazard Analysis Report. The Melter Incident report recommended that "concerns that arise must be captured and maintained until formal resolution is reached through an approval process."

- Detailed maintenance logs should be kept to maintain a retrievable record of equipment maintenance for use in future design activities.

Lessons learned from previous projects here, and at other facilities, will be factored into initial planning of future projects and tracked through the design and implementation phases. Utilization of outside industry expertise to review the planning and design process will expand the base of lessons learned from which to draw upon and provide assurance that lessons learned are being factored into the project. The Silos Project lessons learned database, as well as the FEMP-wide DOE complex-wide lessons learned databases will continue to be utilized in planning and implementation of FEMP remedial activities.

Requirements Identification

- All functional requirements, including those for utility and ancillary systems (electrical loading and layout, emergency / backup power, fire protection, weather protection, controller/ DCS logic) as well as operational constraints and capacity requirements should be identified as early in the design process as possible.

- Design change control should be applied during Title I design to verify and justify deviations from originally specified functional requirements

- Requirements for readiness reviews, equipment inspection and testing, and system operability and construction acceptance testing should be considered early in the design process.

- Configuration management should be implemented at the inception of the project

- Maintenance requirements, and maintenance support availability should be considered in specifying equipment.

- The Melter Incident Final Report recommended that site and functional area requirements, including the need to implement formal documented design change control, must be identified in contract specifications prior to issuing the Invitation for Bid or Request for Proposal.

A disciplined requirements identification process will be the initial step in the planning of major FEMP remedial activities. This process will include the development of a detailed Project Execution Plan which comprehensively identifies the requirements of each functional area which are applicable to the project or activity in question. Strict formal design review and change control will be applied to assure that any deviations from these originally

specified requirements are identified and appropriately reviewed. Site specific requirements will be specifically identified and formally communicated to potential vendors.

Design of Ancillary Systems

- Steps to deal with the moisture, particulate loading, and plugging problems in the Pilot Plant off gas system will be incorporated into design of off gas systems for other projects involving the processing of high moisture materials, such as the Waste Pit Remediation facilities.

- Measures implemented to improve operation of the Pilot Plant feed system, such as use of large radius bends rather than elbows, and use of short, straight pipe runs will be applied to design of other material handling systems involving slurries and other wet materials.

- The vendor and design personnel responsible for the main processing equipment (e.g., the melter) should be intimately involved in design of ancillary and utility (off gas, feed, wastewater) systems.
- Critical components should be evaluated collectively for operational impact. A material failure and trending process should be developed to identify deficiencies that potentially can affect similar processes or materials.

Project Integration

- Wherever possible, standard design and drawing formats will be utilized to facilitate interfaces and integration between functional areas.

- Subject matter experts from all disciplines (construction, procurement, operations, maintenance, health & safety, environmental) should be involved from the early design criteria and equipment specification stages and continuously throughout the project. Comprehensive review and input must be maintained to assure identification of interfaces, integration requirements or potential conflicts between functional areas.

- Continuity of vendors and engineering support throughout the project should be maximized. Design of many, or all systems by a single organization should be considered, along with maintaining the same engineering personnel from system engineering and design through the startup and operational support phases.

- Interaction and communication must be maintained between the personnel responsible for analysis and review of operational and environmental data and operations personnel to assure a consistent understanding of operational changes, test results, sampling issues, etc.

This page left intentionally blank.

ATTACHMENT B

PROJECT 1 : ESTABLISHMENT OF A CONSERVATION AREA NEAR THE FEMP

This proposal involves establishing a conservation area on a piece of property that is considered to have high ecological value in the area surrounding the FEMP. Ideally, this area would contain habitats such as riparian areas, wetlands, etc. The proposal would involve DOE and the Regulatory Agencies working with groups such as the Nature Conservancy, the U.S. Fish and Wildlife Service and/or the Ohio Department of Natural Resources to establish a Conservation area on the property. The Conservation area would allow preservation of habitat near the site and would further enhance the proposed Natural Resource Restoration Plan for the FEMP by preserving habitat contiguous with the restored FEMP Site.

Further research would be needed on any piece of property targeted for an easement to determine if the current landowners are willing to cooperate in the establishment of the easement and exactly what the cost would be. The targeted property would be between 30 and 100 acres in size. The establishment of a conservation easement is expected to cost less than the cost of purchasing.

A proposal outlining the proposed property for the area would be submitted to the Agencies no later than November 21, 1997, for review and approval by U.S. EPA.

PROJECT 2: RESEARCH GRANTS FOR ECOLOGICAL RESTORATION

This proposal would provide a great deal of flexibility in terms of cost and schedule for implementation. Essentially DOE would be able to establish grant(s) for whatever dollar amount they chose and establish time frames for the grants that fit the proposed research projects (e.g., annual or biannual). The recommended approach for initiating this proposal would be to identify a set dollar amount as negotiated with the Agencies. The focus of the grants would be to implement research projects involving actual field work (as opposed to only "paper" or "conceptual" research) that would support the proposed restoration efforts at the FEMP. Input would be solicited from Universities participating in the Technical University Program on what type of research would be feasible and beneficial in this region. DOE, in conjunction with the Regulatory Agencies, could review and select the proposals that were determined to be most beneficial. The schedule for conducting the actual research would be dependent on the project that was selected. The general areas of ecological restoration research that would be emphasized are as follows:

Representative Vegetation Plots - The purpose of this research would be to establish vegetation plots that would be representative of the habitats that are targeted for establishment as part of site restoration plans (e.g., riparian, wetland, grassland, Oak-Hickory forests). Permanent plots would be established by placing reinforcement bars at specified areas where follow-up monitoring such as vegetative measurements would occur. The monitoring would focus on the success of the plots and how external influences and management practices influence the various habitats.

Pilot Restoration Projects for Target Species - This research would focus on the success of restoration techniques for targeted species that have specific relevance in this area. The species of interest could be species that are listed for protection (i.e., threatened or endangered species at the state or federal level) or species that would be typical of the land-uses proposed for establishment at the FEMP. The results of the pilot restoration projects would provide information directly applicable to the proposed restoration of the site.

Invasive Species Control - Various techniques for control of non-native species could be employed. These techniques would involve biocontrol methods such as the introduction of plant-specific insects which feed on invasives. Properties of invasive species could be examined to determine their effect on native vegetation.

Techniques for Success Monitoring - Techniques for monitoring the success at the habitat level and/or the species level to ensure that restoration techniques are meeting established goals. Possibilities could include photo monitoring, satellite imagery, etc. As with the specific proposals above, techniques that prove successful could be implemented as part of the restoration efforts at the FEMP.

The precise schedule for each individual grant would vary depending on the scope of the research proposed. Areas of the FEMP that will be targeted for the research will have to be certified clean prior to implementation. Areas that will be targeted will likely be west of Paddys Run. Through the implementation of an accelerated certification process, areas west of Paddys Run can be certified by July of 1998. In parallel with the certification process, a workplan outlining proposed research projects will be developed and submitted to the Agencies by November 21, 1997, for review and approval by U.S. EPA.

PROJECT 3: CREATION OF WILD BIRD/WILD FLOWER HABITAT AREA

The goal for this proposal would be to create a protected habitat for regional species of wild birds and wildflowers both in the same area of the FEMP. Ideally, this project would be implemented in an area that would provide aesthetic appeal to employees, visitors and neighbors. The project would have to implemented in an area that has been certified clean and is expected to require the construction of a shelter and access. The installation of electricity or other utilities for the Habitat Area is not expected to be necessary with the possible exception of water. The costs for the proposal would include planting wildflowers, installing feeders, creating pathways and installing a bird blind.

As with the previous project, the area selected for the habitat area will have to be certified clean prior to implementation. Options for the location of this project would likely be limited to Area 1, Phase I or an area west of Paddys Run. As stated previously, it is anticipated that the area west of Paddys Run can be certified by July of 1998 through an accelerated certification program. In parallel with certification efforts, a Workplan outlining the details of the project will be developed and submitted to the Agencies no later than December 31, 1997, for review and approval by U.S. EPA.

PROJECT 4: RAILROAD TRACK RECYCLING

This proposal involves the size reduction, decontamination, and transport off site for recycling and reuse of 300-500 tons of steel train track rails from the former process area. The monetary amount to be expended on this effort will be commensurate with the amount denoted for Project 4 in Paragraph 13 of the settlement agreement. Steel train track rails will be removed from the former process area and decontaminated either through the onsite FEMP Material Release Facility (MRF) or through a private supplier of decontamination and recycling services. Based on the radiological characterization of the train rails, a wide variety of decontamination techniques may be appropriate, including manually operated abrasive blasting (such as vacuum grit blasting or sodium bicarbonate blasting), automated abrasive blasting (such as continuous feed descaling), or other less aggressive techniques. DOE-FEMP will provide to the agencies a detailed Work Plan for this proposal,which will identify the specific decontamination/release strategy to be utilized, the tonnage of steel to be recycled, and a project schedule, by September 15, 1997, for review and approval of U.S. EPA.

PROJECT 5: STRUCTURAL STEEL DEBRIS RECYCLING

This project involves the decontamination, transport, radiological surveying, and recycling and reuse of 300-500 tons of structural steel and/or oversized material (e.g., steel beams, steel mill rollers, mill stands, counterweights, large tanks or pressure vessels, etc.). The monetary amount to be expended on this effort will be commensurate with the amount denoted for Project 5 in Paragraph 13 of the Settlement Agreement. These materials would be decontaminated and recycled through either the onsite FEMP Material Release Facility (MRF) or through a private supplier of decontamination and recycling services. Based on the radiological characterization and physical configuration of the materials, a wide variety of decontamination techniques may be appropriate, including manually operated abrasive blasting (such as vacuum grit blasting or sodium bicarbonate blasting), automated abrasive blasting (such as continuous feed descaling), or other less aggressive techniques. DOE-FEMP will provide to the agencies a detailed Work Plan for this proposal, which will identify the specific decontamination/release strategy to be utilized, the specific materials and tonnages included, and a project schedule, by September 15, 1997, for review and approval of U.S. EPA.

This page left intentionally blank.

ATTACHMENT C

This page left intentionally blank.

c. FS Report/Comprehensive Response Action Risk Evaluation: September 10, 1993;

d. Proposed Plan: September 10, 1993;

Proposed Draft Record of Decision: June 10, 1994

Operable Unit 4 Modification of December 7, 1994 Record of Decision.

e. Submit Draft Explanation of Significant Differences (ESD) for Silo 3 to U.S. EPA for review, comment, and approval: September 15, 1997

f. Award multi-tech proof of principle contract for Silos 1 and 2: August 10, 1998

g. Submit Draft Supplemental Feasibility Study/Proposed Plan(FS/PP) to U.S. EPA for review, comment, and approval: February 1, 2000

h. Submit Draft Record of Decision (ROD) Amendment for Silos 1 and 2 to U.S. EPA for review, comment, and approval: December 29, 2000

#5. **Operable Unit 5: Environmental Media.** Groundwater, surface water, soil not included in the definitions of OU #1-4, sediments, flora, and fauna.

a. Initial Screening of Alternatives: April 16, 1993;

b. RI Report/Baseline Risk Assessment*: June 24, 1994;

c. FS Report/Comprehensive Response Action Risk Evaluation: November 16, 1994;

d Proposed Plan: November 16, 1994;

Proposed Draft Record of Decision: July 3, 1995.

* The Site-Wide Ecological Assessment shall be included in the Baseline Risk Assessment for OU 5.

Comprehensive Site-Wide Operable Unit: An evaluation of remedies selected for OUs 1-5, above (including remedial and removal actions) to ensure that they are Protective of human health and the environment on a site-wide basis, as required by CERCLA, the NCP and applicable U.S. EPA policy and guidance.

a. Site-Wide RI/Projected Residual Risk Assessment Work Plan Addendum: No later than six (6) months following signature of the ROD for OU 3;

b. Site-Wide RI/Projected Residual Risk Assessment Report: The Site-Wide RI/Projected Residual Risk Assessment Report shall be submitted in accordance with the schedule approved in the Work Plan Addendum above;

c. FS Report: If required by U.S. EPA, the FS Report shall be provided in accordance with the schedule approved in the Work Plan Addendum above.

APPENDIX B

PERMIT INFORMATION SUMMARY FOR THE DECONTAMINATION OF METALS FOR AUTHORIZED RELEASE AT THE FEMP MATERIAL RELEASE FACILITY (BUILDING 68)

CERCLA Section 121(e)(1) states that no Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely on site, where such remedial action is selected and carried out in compliance with Section 121.

Section XIII.B of the Amended Consent Agreement requires the DOE to identify those permits that would otherwise be required, along with the standards, requirements, criteria, or limitations that would have to have been met to obtain each permit. The DOE must report these findings to the U.S. EPA, along with an explanation of how the response action will meet these standards, requirements, criteria, or limitations.

The following summarizes the permits, permit requirements, and plans to meet those requirements for the decontamination activities required under the Recycling Supplemental Environmental Projects.

1. Identification of Each Permit That Would Otherwise be Required.

State Requirements

PERMIT TO INSTALL - Ohio Administrative Code (OAC) 3745-31-02 (A): Unless exempted by OAC 3745-31-03, no person shall cause, permit or allow the installation of a new source of air pollutants or cause, permit, or allow the modification of an air contaminant source without first obtaining a Permit to Install.

PERMITS TO OPERATE - OAC 3745-35-02 (A): Except as otherwise provided in paragraph H (Conditional Permits to Operate) of rule OAC 3745-35-02 and in OAC rules 3745-35-03 (variances) and 3745-35-05 (permit exemptions and registration status), no person may cause, permit, or allow the operation or other use of any air contaminant source without first applying for and obtaining a Permit to Operate.

Federal Requirements

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP) -40 CFR PART 61, SECTION 61.07(a): The owner or operator shall submit to the Administrator an application for approval of the construction of any new source or modification of any existing source. Unless exempted in a specific subpart, an application for approval would have to be submitted for sources subject to a NESHAP standard. The decontamination activities are subject to the requirements of Subpart H of 40 CFR Part 61.

40 CFR PART 61, SUBPART H - NATIONAL EMISSION STANDARDS FOR EMISSIONS OF RADIONUCLIDES OTHER THAN RADON FROM DOE FACILITIES - Section 61.96(b) states that an application for approval does not have to be filed for radionuclide sources if the effective dose equivalent (EDE) caused by all emissions from the new construction or modification is less than 0.1 mrem per year. The EDE shall be determined using an approved U.S. EPA computer model. The source term to be entered into the model to determine the necessity of an application shall be developed using Appendix D to Part 61 - Methods for Estimating Radionuclides.

2. Identification of the Standards, Requirements, Criteria, or Limitations That Would Have to be Met to Obtain Each Permit.

State Requirements

Air Permits to Install: Pursuant to 3745-31-05, the Director of OEPA will issue a APTI provided the installation of the source will not prevent or interfere with the attainment or maintenance of applicable ambient air quality standards and will not result in the violation of emission standards adopted by OEPA. Pursuant to 3745-31-05, the sources must employ best available technology.

Air Permits to Operate: Pursuant to 3745-35-02, the Director of OEPA will issue a APTO provided the source was constructed in accordance with the terms and conditions of the Permit to Install, or if exempted from a PTI, meets the substantive requirements of a PTI. Additionally, the source must not violate NESHAPs adopted by the Administrator of the U.S. EPA.

Federal Requirements

NESHAP SUBPART H - 40 CFR PART 61, SECTION 61.92: Emissions of radionuclides (except radon^{222} and radon^{220}) to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr.

NESHAP SUBPART H - 40 CFR PART 61, SECTION 61.93: Continuous measurement of radionuclide emissions is required for point sources having the potential to cause an EDE in excess of 0.1 mrem/yr. The EDE is again determined by an approved U.S. EPA computer model. However, for the purposes of determining monitoring requirements, the estimated radionuclide release rates are based on normal facility operations, without the benefit of any pollution control equipment. Additionally, all radionuclides which could contribute greater the 10% of the potential EDE for a release point shall be measured.

3. **Explanation of How the Response Action Will Meet the Standard Requirement, Criteria, or Limitations Identified in Item 2 Above.**

Satisfaction of State Requirements Relative to Air Permits (APTI & APTO)

The activity will have two separate emission points. There will be an enclosure for the vacuum grit blaster and the soda blaster (if used). Each blast head will be enclosed with a herculite tent and the tent contents exhausted through a portable HEPA unit. This mode of operation ensures all emissions are HEPA controlled satisfying OEPA best available technology (BAT) requirements.

Emissions at the blast head of the vacuum grit blaster are controlled 99% by the vacuum nature of the blaster. Blast material and surface debris are vacuumed back into a dust separator, integral to the machine, containing angled steel emission pads that reduce the speed of the exhaust allowing heavy matter to drop out for recycle while the dust is exhausted through a HEPA device (also integral to the machine).

Emissions at the blast head of the soda blaster are controlled at the blast head by a surrounding spray of water that scrubs the soda and other contaminants generated by

the blasting from the air off gas stream after impact. The blast mixture is washed away using additional water, stored, and later treated at the AWWT in compliance with the requirements of the FEMP's NPDES permit. Air emissions are controlled by more than 95% by the scrubbing nature of the blaster.

Satisfaction of Federal Requirements Relative to NESHAP Subpart H

The activity as required by 40 CFR Part 61.96(b) were modeled using CAP88PC computer model. The modeling yields an EDE of 3.3E-5 mrem/yr to the maximally exposed individual. New or modified sources of radionuclides whose EDEs are determined to be less than 0.1 mrem/yr are not required to submit applications for approval to the U.S. EPA.

Modeling of the source terms developed under 40 CFR Part 61.93(b)(4)(ii) yields an EDE of 3.3E-2 mrem/yr to the maximally exposed individual. For this activity, both emission points were modeled as one even though it would be allowable to model both separately. So the actual EDE for each emission point is less than 3.3E-2 mrem/yr. Since the EDE is lower than 0.1 mrem/yr criteria a continuous sampler is not required for either point source.

Appendix C
Radiological Requirements for the Authorized Release of Materials at the FEMP

Appendix C contains RP-0009, the procedure detailing the radiological requirements for releasing materials from Fernald. The certification program for the authorized release of materials from the FEMP is also discussed in Appendix C of the OU3 Integrated RD/RA Work Plan (final, May 1997).

This page left intentionally blank.

1129

CONTROL NUMBER: [redacted]
FUNCTIONAL AREA PROCEDURE RP-0009
REVISION NO. 2

RADIOLOGICAL REQUIREMENTS FOR THE RELEASE OF MATERIALS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

RP-0009

Effective Date: 2/18/97

Originator (Subject Expert): _____ James R. Wells — Date: 1/29/97

Checker Concurrence: _____ M.C. Tester, Radiological Control Manager — Date: 1/29/97

Approved By: _____ S. L. Hinnefeld, FAM, S&H Division — Date: 2/10/97

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
Fluor Daniel Fernald, Inc.
P. O. Box 538704
Cincinnati, Ohio 45253-8704

Title: RADIOLOGICAL REQUIREMENTS FOR THE RELEASE OF MATERIALS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)	DOCUMENT NO: RP-0009	
	Effective Date: 02/18/97	Revision No. 2
Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work	Page 1 of 20	

TABLE OF CONTENTS

LIST OF ATTACHMENTS

ISSUE AND REVISION SUMMARY

Revision	Date	Description of Issue or Revision
0	5/26/94	Initial Implementation
1	6/12/95	Being revised to incorporate changes initiated by J. Wells and format changes in accordance with MS-08-1001.
2	2/18/97	Revision initiated by J. Wells to incorporate ICPs IC95-068 and IC95-069; and to update references and responsibilities to reflect the FDF reorganization.

Title: RADIOLOGICAL REQUIREMENTS FOR THE RELEASE OF MATERIALS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)	DOCUMENT NO: RP-0009	
	Effective Date: 02/18/97	Revision No. 2
Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work	Page 3 of 20	

1.0 PURPOSE

To establish the methods and requirements for the release of materials from Controlled Areas or from Radiological Areas established to control surface or airborne radioactivity to the Controlled Areas.

2.0 SCOPE

This procedure discusses unrestricted and restricted release of material to the uncontrolled area and the release of material from Radiological Areas to Controlled Areas. It applies to all FEMP personnel involved in the release process. The survey requirements of this procedure do not apply to materials exiting Controlled Areas that are established based on radiation levels alone or to materials being shipped as radioactive material per 49CFR.

3.0 REFERENCES

3.1 RM -0020, FERMCO Radiological Control Requirements Manual

3.2 DOE Performance Objective for Certification of Non-Radioactive Hazardous Waste (REV 1, dated October 10, 1994)

3.3 Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors

3.4 SD-ESH-BAS-3013, FEMP Technical Basis Document for the Use of Portable Instrumentation

3.5 SD-ESH-BAS-3014, Decision Basis to Release Materials For Unrestricted Use

3.6 RC-RDA-010, Radiological Contamination Surveys

3.7 RP-0010, Identification and Movement of Radioactive Material

3.8 SR-0004, Establishment and Management of Radioactive Material Management Areas (RMMAs)

3.9 RC-DPT-012, Radiological Records Management

3.10 RC-DPT-023, Quality Control of Radioactivity Counting Systems

3.11 SD-ESH-BAS-3022, Technical Basis: Quality Control of Radioactivity Counting Systems

3.12 RP-0003, Performing Personnel Monitoring

4.0 RESPONSIBILITIES

4.1 General Employee - Notifies Radiological Control to perform a radiological release survey prior to removing materials from Controlled Areas or Radiological Areas established to control the spread of contamination. This includes movement of material from a Controlled Area to the uncontrolled area unless that area is posted based on radiation levels alone, or movement of material from a Contamination Area, High Contamination Area, or Airborne Radioactivity Area to the Controlled Area. Provides documented process knowledge, analytical data, or other documentation as requested by Radiological Control personnel when necessary to support the release decision.

4.2 Manager, Radiological Control - Ensures that all radiological control personnel performing this procedure are trained to this procedure. Designates additional personnel who are authorized to act as a Material Release Evaluator outside of those positions/job titles already authorized by this procedure.

4.3 Material Release Evaluators

1. Evaluates the unrestricted release of material when any of the following conditions are encountered:

   A. Material has the potential for contamination in areas which are inaccessible for proper survey.

   B. Process knowledge is used to support the release decision.

   C. Material has the potential of contamination beneath a coating applied while the material was in the Controlled Area.

   D. Material has the potential for volume or in-depth radioactivity within the material matrix.

   E. Special case items are being released such as radioactive consumer products, industrial sources, etc.

   F. Material has detectable activity present, but the activity is below the contamination limits listed in Attachment A.

2. For material with detectable contamination but less than the release limits of Attachment A, performs an evaluation to ensure that all reasonable attempts have been made to reduce the residual radioactivity to as low as reasonably achievable prior to the release.

3. Evaluates and approves the restricted release of all material prior to exiting the Controlled Area of the FEMP to ensure the material is controlled or of such condition that no reasonable potential exists for the spread of contamination beyond the Controlled Area. The evaluator ensures that the Radiological Control Technician and the individual receiving the material understand all restrictions placed upon the restricted release.

4.4 OP&I, Radiological Control Department personnel - When requested, provides regulatory or technical guidance to assist those personnel involved in the release process. Approves the restricted release of material when the material is to exit beyond the FEMP property boundary.

4.5 Radiological Control Technicians (RCT) - Performs and documents all radiological release surveys. Routes survey data and related release packages for approvals as required in this procedure and Reference 3.9.

4.6 Radiological Control Supervisor - Reviews the Restricted Release Log on a weekly basis to verify correctness and to maintain cognizance of material status. Review radiological release surveys. Ensure RCTs performing the requirements of this procedure are qualified in accordance with Reference 3.1.

5.0 GENERAL

5.1 Acceptable surface contamination levels for known radionuclides are set forth in Attachment A, Surface Contamination Limits.

5.2 Appropriate instrumentation for release surveys based on instrument detection limits and the isotope of concern are listed in Attachment B, Survey Methods and Isotopes of Concern. If the Lower Limit of Detection of the monitoring method in use is below the removable limits of Attachment A for the specific isotope of concern then removable surveys are not required and the material may be evaluated based on direct monitoring methods alone.

5.3 The specific isotope of concern for various areas within the FEMP site are listed in Attachment B. If isotopes other than U-238 and associated daughter products are suspected, then the most restrictive release limit must be applied until adequate isotopic data can be obtained.

NOTE: Attachment B serves as a general guideline only. Isotopic data or process knowledge may be used over these general guidelines where appropriate.

5.4 When normal or depleted uranium is the contaminant of concern, beta surveys alone are acceptable for verifying compliance within the release limits.

5.5 Contamination surveys may be performed with hand held portable instruments or automated equipment provided that the contamination limits given in Attachment A can be detected.

5.6 Materials with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release, unless the item can be disassembled to permit an adequate survey or well documented process knowledge can be applied to certify that internal contamination is not probable.

5.7 Consumer products containing nominal amounts of radioactivity or naturally occurring radioactivity excepted from regulation or licensing under EPA, DOE, or NRC regulations at the time of receipt at the FEMP may be released for unrestricted use provided the existing radioactivity has not been enhanced or concentrated as a result of site operations and evidence can be provided that the item has not been contaminated while at the FEMP. Isotopic analyses, process knowledge, or surface contamination surveys should be performed as required based on a case-specific evaluation of the material.

5.8 Items such as liquids, bulk materials (sand, concrete rubble, etc.) must be evaluated for the potential for volume or in-depth contamination within the material matrix prior to release. A combination of process knowledge, surface contamination data, or analytical data as appropriate must be provided to support the rationale that no radioactivity could have been added to the material as a result of site operations.

5.9 All documented process knowledge used to support the release decision must be attached to the release package.

5.10 Items with detectable fixed contamination that is less than the unrestricted release limits of Attachment A must be further evaluated prior to unrestricted release to ensure that all reasonable attempts have been made to reduce the residual radioactivity on the item to as low as reasonably achievable.

5.11 Contamination surveys are to be performed in accordance with the requirements of Reference 3.6.

5.12 Direct frisk release surveys with portable instruments may not be performed in an area of background exceeding 300 cpm beta/gamma or alpha instrument background >12 cpm.

5.13 Items with surface contamination exceeding the release limits of Attachment A must be identified and handled as radioactive material in accordance with Reference 3.7.

5.14 Personal items are to be surveyed at the control point exits in accordance with the posted frisking instructions and Reference 3.12. These items may be surveyed by the material owner or by the RCT if requested.

5.15 Material that is in its original sealed manufacturers packaging or material with internal surfaces sealed from the environment with no potential for contamination within the material internals may be released based on surface contamination monitoring techniques only. Material Release Evaluator concurrence is not required in this situation.

5.16 Materials not immediately released upon survey shall be controlled to prevent contact with radioactive contamination while awaiting release.

5.17 Materials not released to uncontrolled areas within eight hours following survey shall be resurveyed unless each of the following conditions have been met. This step is not applicable to items placed in a staging area as discussed Step 5.18.

1. The material or articles are placed in a container or building that meets the unrestricted release limits.

2. The containers or buildings are sealed using a tamper proof seal with a unique identification number. If required, tamper proof tape with RCT initials across the seal may be used but this is least preferred. Containers may be anything that prevents contamination, such as drums, sealands, toolboxes, etc.

3. The seal identification number shall be recorded on the radiological survey report form.

4. If the container is to be released with the materials inside, its external surfaces must be resurveyed per this procedure prior to release.

5.18 When storage in containers or buildings is not practical, large items or lots of items may be placed in a staging area while awaiting survey results or while finalizing release documentation with the following additional controls.

NOTE: The use of staging areas should be minimized. Immediate release following survey or the controls outlined in Step 5.16 should be pursued prior to establishing these areas.

1. A comprehensive unrestricted release survey must be performed on all materials prior to entry into the staging area.

2. Radiological Control oversight of the area (Radiological Control notification prior to entry) must be maintained to prevent mixing of previously surveyed items and potentially contaminated material.

NOTE: If material mixing is suspected then a comprehensive unrestricted release survey must be re-performed on all items within the staging area.

3. A cursory survey (including large area smears as a minimum) shall be performed prior to the actual release of the staged material to the uncontrolled area.

6.0 PREREQUISITES

Supervisor, Radiological Control (or designee)

By reviewing training records, ensure that all radiological control personnel performing this procedure are trained per the requirements of RM-0020.

7.0 PROCEDURE

7.1 UNRESTRICTED RELEASE OF MATERIALS FROM THE CONTROLLED AREA

Radiological Control Technician

1. Determine the material history considering the purpose of the item, the current and past use of the item, location in which the item was stored, and if the item had ever been used for work with radioactive material.

2. Determine the need for material disassembly for access into internals or other inaccessible areas. This determination may require assistance from a Material Release Evaluator.

3. Ensure that any residual radioactive material labels or indicators are defaced from the material. This could include radioactive material stickers, painted trefoils, or other radioactive material symbols.

4. Perform large areas smears on 100% of the effective area of the material to evaluate for gross removable contamination. If no detectable levels of removable contamination are found then proceed to Step 7.1.6.

5. If detectable levels of removable contamination are found, then don protective clothing such as gloves to complete the survey and perform disc smears to evaluate for removable activity per 100 cm^2.

NOTE: **The material must be considered contaminated until the results of the disc smear survey prove otherwise.**

A. If no detectable levels of removable contamination are found then proceed to 7.1.6.

B. If detectable levels of removable contamination are found on the disc smears, then the material may not be released for unrestricted use without further evaluation and approval by a Material Release Evaluator.

6. Evaluate for fixed activity on 100% of the effective area of the material using direct frisking or automated monitoring techniques.

7. If no detectable contamination is discovered during the survey, then proceed to Step 7.1.10.

8. If detectable contamination is discovered during the survey and the activity is less than the unrestricted release limits outlined in Attachment A, then a Material Release Evaluator must approve the release decision.

9. If contamination levels exceeding the unrestricted release limits of Attachment A are discovered, then the material may not be released for unrestricted use and must be controlled as radioactive material.

10. Document the survey results and fill in the applicable portions of Attachment D, Material Unrestricted Release Form.

11. If any of the conditions of Step 4.3 are met, then route the release package to a Material Release Evaluator for further evaluation and approval of the release decision. If none of these conditions are met then proceed to Step 7.1.13.

Material Release Evaluator

12. Review the release package and the material if needed. If all requirements for unrestricted release have been met, then sign the Material Release Form to approve the release.

Radiological Control Technician

13. Distribute copies of the release package to the survey requester or material owner.

14. Maintain the original copy of the release package in accordance with Reference 3.9.

7.2 RESTRICTED RELEASE OF MATERIALS FROM THE CONTROLLED AREA

Radiological Control Technician

1. Perform a removable contamination survey on 100% of the effective area of the material.

2. Evaluate for fixed contamination of the material using direct frisk or automated monitoring techniques.

3. Document the results of the survey on Attachment C, Radiological Survey Report form.

4. Fill out the applicable portions of Attachment E, Material Restricted Release Form and route the release package to a Material Release Evaluator for review.

5. Log the item in Attachment F, Restricted Release Log, including survey number, item description, date released and the material owner.

NOTE: For items being shipped to an off-site licensed facility, the name of the facility or lab receiving the material should be listed in the Material Owner block and the date returned block is not applicable.

Material Release Evaluator

6. Evaluate for the potential for the spread of contamination if the material is used in the uncontrolled area based on contamination levels on the material, use of the material, etc.

7. List any further administrative controls which may need to be applied to the material to prevent a potential spread of contamination in the comments section of the Material Restricted Release form. This may include storage requirements, limitations of use, containment of the material, RCT escort, or other controls as applicable.

NOTE: Radioactive material must be labeled appropriately and stored in an approved, properly posted area when the material is not in use or under escort by a qualified Radiological Worker.

8. If the requirements for restricted release of the material have been met, then sign the Material Restricted Release form to approve the release.

Radiological Control Technician

9. If the material will be exiting beyond the FEMP property boundary then route the release package to Radiological Control for approval.

NOTE: Radiological Control approval is required to ensure that other regulatory requirements are not violated such as Department of Transportation shipping regulations or facility licensing requirements.

10. Route the release package to the survey requestor for signature. Inform the survey requestor of special requirements associated with the restricted release and the need to contact Radiological Control when the item is returned to the Controlled Area.

Survey Requestor

11. Sign the Material Restricted Release Form accepting responsibility for the material while it is in the uncontrolled area and ensure that all controls applied to the material are met. This step is not applicable when sending radioactive or potentially radioactive materials to licensed facilities.

NOTE: **Only FEMP qualified Radiological Workers may sign the responsibility of materials undergoing a restricted release.**

12. Inform the Radiological Control Technician when the item is returned to the Controlled Area for material tracking purposes and completion of Attachment F.

13. Distribute copies of the release package to the survey requestor or material owner.

14. Maintain the original copy of the release package in accordance with Reference 3.9.

Radiological Control Supervisor (or designee)

15. Review the Restricted Release Log on a weekly basis to verify completeness and to maintain cognizance of material status.

7.3 RELEASE OF MATERIALS FROM CONTAMINATION AREAS, HIGH CONTAMINATION AREAS, OR AIRBORNE RADIOACTIVITY AREAS TO CONTROLLED AREAS

Radiological Control Technician

1. Don protective anti-contamination gloves, as a minimum.

2. Determine material history considering the purpose of the item, current and past use of the item, location in which the item was stored and if the item had been used for work with radioactive materials.

3. Determine the need for material disassembly for access to the material internals or other inaccessible areas.

4. Verify area background meets the requirements of Step 5.12. If background is excessive then transfer the material to an area of lower background prior to performing the survey.

5. Perform a radiological survey in accordance with Reference 3.6, to evaluate for contamination levels on the material. Document results on Attachment C, Radiological Survey Report Form .

6. If the release limits of Attachment A are met then the item may be released to the Controlled Area.

7. If removable contamination on the material exceeds the surface limits of Attachment A then the material may be conditionally released for movement on-site from one Radiological Area for immediate placement in another Radiological Area in accordance with the requirements of Reference 3.7.

8. If the item has fixed contamination exceeding the Attachment A limits and the removable levels of contamination are below the Attachment A limits then the item may be released to the Controlled Area provided the item is identified as radioactive material in accordance with Reference 3.7.

9. If the item to be released is tagged or identified as radioactive material then note this on the release package.

10. Distribute copies of the release package to the survey requestor or material owner.

11. Maintain the original copy of the release package in accordance with Reference 3.9.

8.0 RECORDS

The following records are generated as a result of this procedure and are to be handled in accordance with Reference 3.9.

8.1 FS-F-1993-1, Radiological Survey Report Form

8.2 FS-F-3915, Material Unrestricted Release Form

8.3 FS-F-3916, Material Restricted Release Form

8.4 FS-F-4502, Restricted Release Log

9.0 DRIVERS

9.1 FERMCO Radiological Control Requirements Manual RM-0020

9.2 DOE Order 5400.5, Radiation Protection of the Public and the Environment

9.3 10 CFR 835, Occupational Radiation Protection

9.4 DOE/EH-0256T, Radiological Control Manual

9.5 DOE Performance Objective for Certification of Non-Radioactive Hazardous Waste (REV 1, dated October 10, 1994)

10.0 DEFINITIONS

10.1 Detectable Activity - Activity detected on the material which exceeds the minimum detectable activity value for the measurement method in use.

10.2 Effective Area - Those areas of the material which are likely to be contaminated such as welding machine cooling fans, installed filters, electric motor armatures, etc.

10.3 Lower Limit of Detection (LLD) - The smallest amount of sample activity that will yield a net count for which there is a confidence at a predetermined level that activity is present. LLD values for various measurement processes are further discussed in Reference 3.5.

10.4 Material Release Evaluator - An individual authorized to evaluate and approve the unrestricted release of materials when special considerations referenced in Step 4.3 are encountered. Unless otherwise approved by the Radiological Control Manager, the Radiological Control Supervisors, Cognizant Radiological Project Engineers, and the Radiological Control Health Physicists are the only personnel authorized to evaluate such items for unrestricted release.

10.5 Personal Items - Items such as personal briefcases, pens, papers, personal umbrellas, personal clothing, etc.

10.6 Process Knowledge - Documented evidence, provided by the material generator, user or owner, demonstrating that no radioactivity could have been added to the material as a result of site operations. This generally includes material handling, usage, and storage methods/procedures or other material history which supports the release. Process knowledge documentation is the responsibility of the material generator but may require assistance from Radiological Control personnel.

10.7 Staging Area - An area established to clearly mark and isolate material which has been surveyed for unrestricted release and is awaiting finalization of the survey data or documentation. This does not constitute a radiological posting and may typically be identified with white rope and notification signs requiring RCT notification or escort prior to entry into the area. Yellow and/or Magenta signs or barricades should not be used for this purpose.

10.8 Radioactive Material Management Area (RMMA) - An area in which the potential exists for contamination due to the presence of unencapsulated or unconfined radioactive material. This term is driven by the DOE EM-30 Performance Objective for Certification of Non-Radioactive Hazardous Waste. In accordance with Reference 3.8, all Controlled Areas of the FEMP are considered RMMAs unless they are controlled based on radiation levels alone. RMMAs do not require special posting.

10.9 Radiological Areas - Any area within a controlled area which must be posted as a "Radiation Area", "High Radiation Area", "Very High Radiation Area, "Contamination Area", "High Contamination Area", or "Airborne Radioactivity Area" in accordance with Reference 3.1.

10.10 Release Package - A collection of documentation supporting the release decision. It generally contains the radiological survey report for the item to be released, a material release form, and any associated documentation of process knowledge. As a minimum, the following information must be contained within the release package:

1. Property description
2. Date on which the release survey was performed
3. Identity of the individual performing the release survey
4. Type and identification of the instrument used
5. Results of the survey
6. Identity of the recipient of the released material
7. Location from which the material was released
8. Material Release Evaluator review and approval of the release (as applicable)

10.11 Restricted Release - A release of material from the Controlled Area of the FEMP in special situations. Examples include but are not limited to temporary transfer of materials between Controlled Areas, material transfers to other DOE facilities, and release of samples to off-site NRC or agreement state licensed labs for analysis. This release applies administrative controls on the material to maintain it under FEMP control (or transfers the material control to another facilities radiological control program in the case of off-site shipments) and ensures the material is returned to the Controlled Area after use.

10.12 Unrestricted Release - Release of material from administrative control after confirming that residual radioactive material meets the requirements of this procedure.

Attachment A
SURFACE CONTAMINATION LIMITS[a,f]

NUCLIDE[f]	FIXED PLUS REMOVABLE		REMOVABLE[b,e]
	AVERAGE[b,c]	MAXIMUM[b,d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

[a] Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contamination should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the activity per unit area should be based on the actual area and the entire surface area should be wiped.

[f] The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 are taken from NRC Regulatory Guide 1.86. Consult with Radiological Control when required to apply these limits for unrestricted release.

Attachment B
SURVEY METHODS AND ISOTOPES OF CONCERN

Isotope of Concern	Area [1]	Preferred Survey Technique
Ra-226	K-65 Silo 1 & 2 Residues	Alpha direct frisk in scaler mode. Smears counted on a low background counter.
Th-230	Waste Pit 1-5 Silo 3 in Waste Storage Area	Alpha direct frisk in scaler mode. Smears counted on a low background counter.
Th-232	Pilot Plant Wet Side Building 64, 65, 67, 68 Quonset Huts, Plant 6 Thorium Furnace, Plant 8 Control Room Walls	Alpha direct frisk. Smears counted on a low background counter.
U-235 (enriched uranium)	Enriched material storage areas	Alpha direct frisk. Smears may be counted using portable alpha instruments
U-238 (depleted or normal uranium)	Controlled Areas other than those mentioned above	Beta direct frisk or automated monitor. Smears counted using portable beta/gamma instruments.

[1] Uranium ore material, low enriched uranium and Th-232 were processed in the past in various areas throughout the site including the Pilot Plant, Plants 1, 2/3, 8 and 9. When accessing holdup material within equipment internals, base the isotope of concern on available process knowledge, radiological survey results and available analytical data.

Title: RADIOLOGICAL REQUIREMENTS FOR THE RELEASE OF MATERIALS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)	DOCUMENT NO: RP-0009	
	Effective Date: 02/18/97	Revision No. 2
Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.	Page 17 of 20	

Attachment C
FEMP
Radiological Survey Report Form

SURVEY NUMBER: _____

DATE: S	RCT NAME:	RCT BADGE #:	PAGE:
REVIEWED BY:		REVIEWER BADGE NO:	___ OF ___

MODEL	SERIAL NUMBER	TYPE (α, β, γ)	CALIBRATION-DUE DATE	BKGD. (cpm)	EFF./CF	COUNT TIME (MIN)	MDA (dpm)	INSP./PERFORMANCE TEST SAT?	
								YES	NO
		A							

ITEM NUMBER	LOCATION AND/OR DESCRIPTION	HEIGHT (FT.)	DPM/100cm² ALPHA		DPM/100cm² BETA-GAMMA		CORRECTED DOSE RATE (MREM/HR)			
			REMOVABLE (1)	FIXED PLUS REMOVABLE	REMOVABLE (1)	FIXED PLUS REMOVABLE	γ CONTACT	β CONTACT	γ AT ___ FT.	β AT ___ FT.
					P					

Note (1): Values identified by an asterisk (*) indicate results are less than the calculated MDA (RC-RDA-010).

FS-F-1993-1 (REV. 04/18/95)

E

Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.

Attachment D

Material Unrestricted Release Form (FS-F-3915)

FEMP
MATERIAL UNRESTRICTED RELEASE FORM

SURVEY # ______ PAGE ____ OF ____

DATE:	LOCATION:	RCT (PRINT):	SIGNATURE:	BADGE #:

MODEL	SERIAL NUMBER	TYPE ALPHA or BETA/GAMMA	CAL DUE DATE	BKGD (CPM)	EF	MDA (CPM)	INST. PERFORMANCE TEST SAT?	
							YES	NO

TIME	RCT INITIAL	MATERIAL DESCRIPTION	RELEASE CRITERIA SURF or VOL	RESULTS				RELEASE JUSTIFICATION	RECIPIENT	MATERIAL RELEASE EVALUATOR BADGE # and SIGNATURE (1)
				ALPHA		BETA/GAMMA				
				REMOVABLE	FIXED + REM	REMOVABLE	FIXED + REM			

Comments ____________________

REVIEW:	INITIAL	DATE

(1) Material Release Evaluator approval required in accordance with RP-0009, Radiological Requirements for the Release of Materials at the Fernald Environmental Management Project, if any of the following conditions exist:

a. Material has potential for contamination in areas which are inaccessible for proper survey.
b. Process knowledge is used to support the release decision.
c. Material has potential of contamination beneath any coating applied while the material was in the Controlled Area.
d. Material has potential for volume or in-depth radioactivity within the material matrix.
e. Special case items are being released, such as radioactive consumer products, industrial sources, etc.
f. Material has detectable activity present and the activity is below the contamination limits listed in Attachment A of RP-0009.

FS-F-3915 (REV. 12/07/95)

0000 03

Title: RADIOLOGICAL REQUIREMENTS FOR THE RELEASE OF MATERIALS AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT (FEMP)	DOCUMENT NO: RP-0009	
	Effective Date: 02/18/97	Revision No. 2
Compliance with this procedure is mandatory while performing the activities within its scope. Only a controlled copy may be used in the performance of work.	Page 19 of 20	

Attachment E
Material Restricted Release Form

Item Number	Item Description	RCT	Material Release Evaluation Print/Signature [1&3]	Material Owner/Survey Requestor Print/Signature [2&3]
	A			
			V	

Additional Comments

[1] Signature by Material Release Evaluator indicates the material may be released for restricted use in the uncontrolled area of the FEMP site only. This material is not being released for unrestricted use.

[2] Signature by the Material Owner/Survey Requestor indicates acceptance of responsibility for the material while in the uncontrolled area and the material will be returned to the controlled area following use.

[3] Additional approval by the Manager of Radiological Control or designee is required prior to allowing the material to exit beyond the FEMP property boundary. This allowance may be annotated, by signature, in the additional comments section of the form.

FS-F-3916 (REV. 06/22/94)

Attachment F
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
Restricted Release Log

RAD. SURVEY NUMBER	ITEM DESCRIPTION	DATE RELEASED	DATE RETURNED*	Material Owner/Survey Requestor*	RCT INIT.
	A				
	M				
		F			
			L		

E

* - For environmental samples or other items undergoing restricted release to off-site NRC or Agreement State licensed facilities, the name of the facility or lab receiving the material should be listed in the Material Owner/Survey Requestor block and the Date Returned block is not applicable.

RCT Supervisory Review_____ **Date**_____

FS-F-4502 (REV. 01/09/95)