

7512

R-020-204.28

**REMOVAL ACTION 9, RECHNOLOGY SPECIFIC WORK PLAN FOR  
WASTE SEGREGATION**

**02/27/96**

**DOE-0518-96  
DOE-FN        EPAS  
75  
WORK PLAN**



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

FEB 27 1996

DOE-0518-96

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

**Mr. Tom Schneider, Project Manager**  
Ohio Environmental Protection Agency  
401 East 5th Street  
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

**REMOVAL ACTION 9, TECHNOLOGY SPECIFIC WORK PLAN FOR WASTE SEGREGATION**

The purpose of this letter is to transmit for approval, the Department of Energy, Fernald Area Office (DOE-FN) Technology Specific Work Plan for Waste Segregation. The project will be implemented under the scope of Removal Action Number 9, Removal of Waste Inventories, the Director's Final Findings and Orders (DF&O), dated October 4, 1995, and the Chemical Treatment Project General Work Plan.

The DF&O approved the Fernald Environmental Management Project (FEMP) Site Treatment Plan as developed to comply with the Federal Facility Compliance Act (FFCA). Under that plan, a commitment was made to submit a work plan for Mixed Waste Chemical Treatment which was submitted in November 1995 and approved in January 1996. The Mixed Waste Chemical Treatment Work Plan requires submission of technology specific work plans for each specific treatment process to be conducted under the scope of the Chemical Treatment Project.

If you have any questions regarding this issue, please contact Robert Danner at (513) 648-3167.

Sincerely,

Johnny W. Reising  
Fernald Remedial Action  
Project Manager

FN:Danner

**Enclosure: As Stated**

**cc w/enc:**

**R. L Nace, EM-423/GTN  
G. Jablonowski, USEPA-V, 5HRE-8J  
Manager, TPSS/DERR, OEPA-Columbus  
M. Savage, OEPA-Columbus  
P. Pardi, OEPA-Dayton  
F. Bell, ATSDR  
D. Ward, GeoTrans  
R. Vandegrift, ODOH  
S. McLellan, PRC  
~~AR Coordinator, FERMCO~~**

**cc w/o enc:**

**J. Sattler, DOE-FN  
D. Dilday, FERMCO/16-2  
R. George, FERMCO/52-2  
T. Hagen, FERMCO/65-2  
C. Little, FERMCO/2  
M. West, FERMCO/35-1  
M. Yates, FERMCO/9**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
MIXED WASTE CHEMICAL TREATMENT PROJECT  
WASTE SEGREGATION  
TECHNOLOGY SPECIFIC WORK PLAN**

**DOCUMENT #8ADD9-2200-003**

**Rev. 0**

**January 1996**

**Prepared by  
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION  
P.O. BOX 538704  
CINCINNATI, OHIO 45253-8704**

**Prepared for  
U.S. DEPARTMENT OF ENERGY  
FERNALD FIELD OFFICE  
Contract DE-AC24-92OR21972**

**000003**

MIXED WASTE CHEMICAL TREATMENT PROJECT  
 WASTE SEGREGATION  
 OHIO EPA RCRA PART B PERMIT  
 SUBSTANTIVE COMPLIANCE DEMONSTRATION

ITEM	CROSS REFERENCE INDEX
Land Disposal Restrictions (LDR) (OAC 3745-59) (40 CFR 268)	Section 1.0; 1.1 and 3.3.3.5
Hazardous Waste Determinations (OAC 3745-52-11) & (40 CFR 262.11)	Section 2.0; 3.2.3; 3.3.3.4; 3.8 and 6.5
Interim Status: Treatment, Storage, and Disposal Facility General Facility Standards (OAC 3745-65-13 through 16) (40 CFR 265.13 through 265.16)	Section 2.0; 3.5.4.1; 3.6; 3.8; 5.0; 6.5 and 6.6.2
Container Storage (OAC 3745-52-34, 3745-66-70 through 77) (40 CFR 265.34, 265.170 through 265.177)	Section 3.2.4; 3.3.3.2; 3.3.3.6; 3.5.1; 3.5.2; 3.5.4.1 and 3.6.1.2
Residue of Hazardous Waste in Empty Containers (OAC 3745-51-07) (40 CFR 261.7)	Section 3.2.4 and 3.5.4
Interim Status: Treatment, Storage, and Disposal Facility Preparedness and Prevention (OAC 3745-65-31 through 35, 3745-65-37) (40 CFR 265.31 through 265.35, 265.37)	Section 3.5.3 and 3.6
Interim Status: Treatment, Storage, and Disposal Facility Contingency Plan and Emergency Procedure (OAC 3745-65-51 through 56) (40 CFR 265.51 through 265.56)	Section 3.5.3 and 5.0
Reusable Equipment Decontamination (OEPA Closure Plan Review Guidance for RCRA Facilities) (pg 27-28)	Section 3.8 and 3.8.3

**NOTE:** Compliance with the applicable or relevant and appropriate requirements (ARARs) is discussed in Section 4.0 and in Table 4-1 of the attached Technology Specific CERCLA Work Plan.

**FEMP MIXED WASTE CHEMICAL TREATMENT PROJECT  
WASTE SEGREGATION  
TECHNOLOGY SPECIFIC WORK PLAN**

**TABLE OF CONTENTS**

Cross Reference Index .....	ii
Table of Contents .....	iii
List of Tables .....	v
List of Figures .....	vi
List of Acronyms .....	vii
1.0 Introduction .....	1
1.1 Objectives .....	3
1.2 Organization of this Work Plan .....	4
2.0 Waste Category Descriptions .....	5
3.0 Segregation Description .....	8
3.1 Segregation Objectives .....	8
3.2 Segregation Categories .....	8
3.2.1 Applicability of Segregation Process .....	8
3.2.2 Waste Batches .....	8
3.2.3 Waste Segregation Subcategories .....	9
3.2.4 Management of Mixed Waste Containers .....	9
3.3 Waste Segregation Process .....	11
3.3.1 Segregation Equipment .....	11
3.3.2 Segregation Personnel .....	13
3.3.3 Segregation Process .....	13
3.3.3.1 Visual Observation .....	13
3.3.3.2 Liquid Removal .....	13
3.3.3.3 Emptying Waste Container .....	13
3.3.3.4 Sorting Procedure .....	15
3.3.3.5 Waste Consolidation .....	15
3.3.3.6 Waste Tracking .....	15
3.4 Process Control .....	17
3.5 Environmental Management .....	17
3.5.1 Waste Minimization .....	18
3.5.2 Prevention of Environmental Media Pollution .....	18
3.5.3 Spill Prevention and Emergency Response .....	19
3.5.4 Waste Management and Disposal .....	19
3.5.4.1 Facility and Container Inspections .....	19
3.6 Facilities and Equipment .....	20
3.6.1 Processing Facilities .....	20
3.6.1.1 Process Area .....	20
3.6.1.2 Exclusion Zone Area .....	20
3.6.1.3 Incoming Waste Staging .....	20
3.6.1.4 Emission Control and Off-Gas Operations .....	23
3.7 Project Schedule .....	23
3.8 Decontamination Activities .....	23

- 3.8.1 Decontamination of Equipment Prior to Use . . . . . 23
- 3.8.2 Decontamination for Routine Good Housekeeping . . . . . 23
- 3.8.3 Decontamination of Equipment and Process Area . . . . . 25
- 4.0 Environmental Compliance . . . . . 26
  - 4.1 Applicable or Relevant and Appropriate Requirements . . . . . 26
- 5.0 Health and Safety . . . . . 31
  - 5.1 Reporting . . . . . 31
    - 5.1.1 Emergency Numbers . . . . . 31
    - 5.1.2 Site Notification Procedures . . . . . 32
    - 5.1.3 What to Report . . . . . 32
  - 5.2 Evacuation Routes/Accountability . . . . . 32
  - 5.3 Emergency Equipment . . . . . 32
  - 5.4 Emergency Response . . . . . 32
    - 5.4.1 Medical Emergency . . . . . 33
    - 5.4.2 Fire Emergencies . . . . . 33
    - 5.4.3 Releases . . . . . 33
  - 5.5 Training . . . . . 33
  - 5.6 Medical Surveillance . . . . . 34
- 6.0 Project Management . . . . . 35
  - 6.1 Organization . . . . . 35
  - 6.2 Work Breakdown Structure . . . . . 35
  - 6.3 Logic Diagrams . . . . . 35
  - 6.4 Quality Assurance . . . . . 35
    - 6.4.1 Criterion 1 - Program . . . . . 35
    - 6.4.2 Criterion 2 - Personnel Training and Qualification . . . . . 39
    - 6.4.3 Criterion 3 - Quality Improvement . . . . . 39
    - 6.4.4 Criterion 4 - Documents and Records . . . . . 39
    - 6.4.5 Criterion 5 - Work Processes . . . . . 40
    - 6.4.6 Criterion 6 - Design . . . . . 40
    - 6.4.7 Criterion 7 - Procurement . . . . . 40
    - 6.4.8 Criterion 8 - Inspection and Acceptance Testing . . . . . 40
    - 6.4.9 Criterion 9 - Management Assessment . . . . . 40
    - 6.4.10 Criterion 10 - Independent Assessment . . . . . 41
- 7.0 References . . . . . 42

LIST OF TABLES

Table 3-1 Waste Segregation Subcategories ..... 10  
Table 4-1 Applicable or Relevant and Appropriate Requirements (ARAR) ..... 27

LIST OF FIGURES

Figure 3-1 Waste Segregation Process Area ..... 12  
Figure 3-2 Waste Segregation Process .....14  
Figure 3-3 Consolidated Drum Packing List ..... 16  
Figure 3-4 FEMP Location Map ..... 21  
Figure 3-5 FEMP Site Map ..... 22  
Figure 3-6 Waste Segregation Project Schedule ..... 24  
Figure 6-1 Organizational Structure ..... 36  
Figure 6-2 Project Work Breakdown Structure ..... 37  
Figure 6-3 Logic Diagram ..... 38

LIST OF ACRONYMS

- 7512

ACA	Amended Consent Agreement
AEDO	Assistant Emergency Duty Officer
ARAR	Applicable or Relevant and Appropriate Requirements
BAT	Best Available Technology
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CFR	Code of Federal Regulations
DOE-FN	U. S. Department of Energy, Fernald Field Office
DOT	U. S. Department of Transportation
EDL	Economic Discard Limit
EPA	Environmental Protection Agency
EPCRA	<i>Emergency Planning and Community Right-to-Know Act</i>
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
FFCAct	<i>Federal Facility Compliance Act</i>
HAZWATS	Hazardous Waste Technicians
HEPA	High Efficiency Particulate Air
IDLH	Immediately Dangerous to Life or Health
LDR	Land Disposal Restrictions
LLRW	Low Level Radioactive Waste
MEF	Material Evaluation Form
MC&A	Material Control and Accountability
MSDS	Material Safety Data Sheet
MVO	Motor Vehicle Operator
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEPA	<i>National Environmental Policy Act</i>
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NTS	Nevada Test Site
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
ppm	Parts per Million
QA	Quality Assurance
QC	Quality Control
RA9	Removal Action No. 9
RCRA	<i>Resource Conservation and Recovery Act</i>
RTR	Real Time Radiography
STP	Site Treatment Plan
TC	Toxicity Characteristic
TCLP	Toxicity Characteristic Leaching Procedure
TSCA	<i>Toxic Substance Control Act</i>
TSDF	Treatment, Storage, and Disposal Facility
WAC	Waste Acceptance Criteria
WWTF	Waste Water Treatment Facility

## FERNALD MIXED WASTE CHEMICAL TREATMENT PROJECT

### 1.0 INTRODUCTION

This technology specific work plan describes the objectives and scope of work for the Mixed Waste Chemical Treatment Waste Segregation Project to be conducted at the U. S. Department of Energy's Fernald Site (DOE-FN) also known as the Fernald Environmental Management Project (FEMP). The FEMP Site is a government owned, former uranium processing facility located near Cincinnati, Ohio. The site was placed on the National Priorities List in 1989 and is currently undergoing remediation under the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) in accordance with the 1991 *Amended Consent Agreement* (ACA) between the DOE and the U. S. Environmental Protection Agency (EPA). Removal Action No. 9 (RA9), "Removal of Waste Inventories" was identified in the Amended Consent Agreement (ACA), September 1991, to address the removal of Low Level Radioactive Waste (LLRW) inventories.

Treatment of the mixed waste materials is also being initiated under RA9. The ACA requires DOE-FN to submit an annual compendium of existing procedures and documentation for the site's Low-Level Radioactive Waste (LLRW) Management Program, in lieu of Removal Action Work Plans. Additionally, DOE-FN committed to submitting project work plans for certain projects, including Mixed Waste Chemical Treatment, in Addendum No. 1 to the RA9 Work Plan. The General CERCLA Work Plan for the Mixed Waste Chemical Treatment Project, approved January 1996, is intended to satisfy ACA and RA9 driven requirements by incorporating documentation and management of the project under RA9. The General CERCLA Work Plan describes multiple treatment processes which will be used to treat listed and characteristic mixed LLRW currently being stored at the FEMP. The General CERCLA Work Plan requires DOE-FN to prepare Technology Specific Work Plans for each specific treatment process. Development of Technology Specific Work Plans is also driven by commitments made by the FEMP in the Site Treatment Plan (STP). Submittal of this technology specific plan is intended to satisfy the STP driven requirements by incorporating documentation and management of the project under RA9.

The Chemical Treatment Project is the implementation of the Ohio Mobile Chemical Treatment System preferred option presented in the FEMP STP. The U.S. Department of Energy (DOE) was required to prepare Site Treatment Plans describing the development of treatment capacities and technologies for treating mixed waste under Section 3021(b) of the *Resource Conservation and Recovery Act* (RCRA), as amended by the *Federal Facility Compliance Act* (FFCAAct). Mixed waste is defined by the FFCAAct as waste containing both hazardous waste subject to RCRA and source, special nuclear, or by-product material subject to the *Atomic Energy Act* of 1954 (42 U.S.C. 2011). The STP was approved and a Director's Final Findings and Orders was issued October 1995.

The first treatment step being implemented under the Chemical Treatment Project is Waste Segregation. The purpose of segregation is to physically separate unlike materials into waste categories for processing through specified treatment processes at a later date. Many of the waste categories require combining multiple treatment technologies to effectively remove contaminants. As stated in the STP, these combined technologies are referred to as a Treatment Train. Chemical treatment processes, employing one of the listed technologies,

comprise a single unit in a Treatment Train. A Treatment Train or combination of technologies may be specified as a single treatment standard per 40 CFR 268.42. Treatment will commence with waste segregation, as described in this plan, and end when the waste meets LDR standards and disposal facility Waste Acceptance Criteria (WAC) qualifying the wastes for final disposition.

## 1.1 OBJECTIVES

The objective of the Mixed Waste Chemical Treatment Project is to safely treat listed and characteristic mixed LLRW currently being stored at the FEMP Site. These wastes have been characterized as containing hazardous constituents regulated under RCRA and include EPA waste codes D001 - D043, F001 - F005, and several U codes. The wastes will be treated to meet RCRA LDR standards and waste disposal facility WAC. Currently, the only permitted TSDF eligible to accept untreated mixed waste in the Chemical Treatment Project inventory can accept lead solids and debris for macroencapsulation. Off-site options will be evaluated and given full consideration as they become eligible. Existing outlets for treated primary and secondary waste include: Envirocare, Nevada Test Site (NTS), FEMP Wastewater Treatment Facility (WWTF) and the Toxic Substance Control Act (TSCA) Incinerator located in Oak Ridge, Tennessee. Additional disposal options will be researched and evaluated as they become available.

Waste streams in the Chemical Treatment Project have been divided into eleven categories. Each waste category represents waste streams which may be treated by a specific treatment process. Due to the variety of mixed waste in the Chemical Treatment Project, multiple treatment processes may be required to meet LDR standards.

This Technology Specific Work Plan is intended to provide a detailed discussion of the scope of work for the Chemical Treatment Waste Segregation Project. It is submitted to comply with the STP pursuant to the FFCAct driven requirements by incorporating documentation and management of the project under RA9. Development of this Technology Specific Work Plan is driven by commitments made by the FEMP in the STP. This Technology Specific Work Plan will demonstrate that the segregation process will be accomplished in compliance with applicable federal, state, and local regulatory requirements, DOE Orders, and site procedures.

## 1.2 ORGANIZATION OF THIS WORK PLAN

This Technology Specific Work Plan is organized in a manner that is consistent with previously submitted and approved Work Plans. This Work Plan provides a general description of how Waste Segregation will be performed. The plan identifies requirements to be addressed for storage, handling, treatment, quality assurance, environmental compliance, and health and safety. Section 2.0 of the Work Plan provides a description of waste streams requiring segregation and the Material Evaluation Form (MEF) waste characterization process performed for each waste stream. Section 3.0 provides a detailed description of the Waste Segregation process. Section 4.0 describes the applicable or relevant and appropriate requirements (ARARs) for this project. Section 5.0 describes the health and safety program to be implemented during this project. Section 6.0 outlines the organization of the project team, and how the work and the project schedule will be managed. Section 7.0 identifies references used in developing this Work Plan.

## 2.0 WASTE CATEGORY DESCRIPTIONS

Since October 1991, RCRA closure actions and CERCLA response actions have redirected the central mission of the FEMP towards the implementation of waste management and environmental restoration initiatives. One of these initiatives is to identify, characterize, treat, and dispose of all mixed waste stored at the FEMP site in accordance with applicable federal, state, and local requirements. Containers of mixed waste identified for treatment in the Chemical Treatment Waste Segregation Project are stored in RCRA storage areas at the FEMP site.

Containers of mixed waste have been grouped and characterized using MEF procedures discussed in this section. MEFs represent waste streams which were placed into waste categories based on waste matrix, characteristics, and constituents. Each waste category represents a grouping amenable to one of the treatment processes discussed in the General CERCLA Work Plan. Real Time Radiography (RTR) which uses x-ray technology to view the contents of a container, visual inspections, and process knowledge were used to categorize the waste streams. General waste categories are provided below:

1. Debris
2. Fines, Sludges, and Soils
3. Mercury Waste
4. Lead Solids
5. Ni-Cd Batteries
6. Reactives
7. Oxidizers
8. Barium Chloride Salts
9. PCBs
10. Corrosives
11. Uranium Residues

A short description of each waste category to be treated by the Chemical Treatment Project is given below.

**Debris** - This includes waste which meets the regulatory definition of debris promulgated in 40 CFR 268.2 (g) (i.e., a solid exceeding a particle size of 60 mm [2.5"] in any dimension). This includes rags, absorbent pads, paper, personal protective equipment (PPE), wood, metal, plastic, etc. Primary contaminants are listed and characteristic organic solvents (halogenated and non-halogenated) and waste oils. Some wastes contain toxicity characteristic (TC) metals (EPA waste codes D004 through D011). All have low concentrations of uranium contamination. The debris may be commingled with other materials which do not meet the definition of debris, including sludges, soils, fines, and liquids.

**Fines, Sludges, and Soils** - This category includes dry granular solids, wet and dry sludges, oily sludges, soils, sump cakes, and other like materials. Primary contaminants are listed and characteristic organic solvents (halogenated and non-halogenated). Organic concentrations range widely from very low concentrations up to 200,000 ppm. Some wastes contain TC metals, and uranium concentrations vary widely.

**Lead Solids** - This category includes solid lead material such as lead bricks, shielding, wire, and tools with uranium surface contamination.

**Ni-Cd Batteries** - Rechargeable batteries containing cadmium with uranium surface contamination.

**Reactives** - Fine metals exhibiting the characteristics of ignitability or reactivity with water. These include granular magnesium metal and calcium metal.

**Oxidizers** - Include oxidizers as defined under 49 CFR 173.127. Primarily, this category includes uranium nitrate, thorium nitrate, sodium nitrate, and potassium nitrate. This category is comprised of solids and liquids.

**Barium Chloride Salts** - Include furnace salts, contaminated brick and floor sweepings. Primary contaminants are TC metals, barium, and lead. Wastes contain barium concentrations as high as 10,000 ppm. Barium chloride is very soluble in water.

**Polychlorinated Biphenyls (PCBs)** - Include PCB contaminated light ballasts, soils, sludges, scabbled concrete, and debris. These contain hazardous and nonhazardous constituents. PCB concentrations vary from 50 - 150 ppm.

**Corrosives** - Include caustic and acidic aqueous solutions with pH greater than or equal to 12.5 or less than or equal to 2.0. These wastes also contain organic solvents (halogenated and non-halogenated) and inorganic hazardous constituents.

**Mercury Waste** - This category includes elemental mercury, various elemental mercury contaminated matrices including debris and water, mercury contaminated salts, mercury batteries, and crushed fluorescent light tubes. Some wastes also contain cadmium, lead, and chromium. Uranium concentrations vary.

**Uranium Residues** - Process residues with uranium concentrations above the Economic Discard Limit (EDL) (i.e., uranium is in sufficient concentration to make recovery economical). The material primarily includes uranium oxides contaminated with TC metals. Some uranium residues are derived from the oxidation of F-listed solvents. These currently meet LDRs, but do not meet disposal facility WAC.

Mixed waste to be segregated in this project has been characterized using process knowledge and sampling and analysis results. Although the drums of mixed waste have been characterized it is possible that some waste containers may contain waste materials or anomalies that differ from the MEF characterization. During waste segregation operations, these anomalies will be identified, segregated, and transferred to the appropriate waste category or characterized and placed in a new category. RTR results, process knowledge and visual inspections will be employed to identify containers requiring segregation.

The primary document for completing waste characterization is the three page MEF. The first page of the MEF is the Generator's Section which summarizes information provided by the FEMP (internal) waste generator. This section is similar to the waste profile sheets used by commercial treatment, storage, and disposal facilities (TSDFs) allowing for documentation of information regarding: generator and waste stream identification; generation information; gross material characteristics; material composition; and health and safety precautions.

The second and third pages of the MEF are the Evaluation Section which summarizes the results of the waste characterization with respect to evaluation criteria, and pertinent information from the evaluation process including: material regulatory status; material management requirements; and health and safety precautions.

The MEF evaluation process relies on a combination of process knowledge and/or sampling and analysis to complete the waste characterization. Process knowledge includes the sum of all information that can be collected on a material, including information from operating procedures, manufacturing specifications, material safety data sheets (MSDS), spill reporting logs, visual inspections, and personnel interviews. All process knowledge contributing to waste characterization is documented in the waste characterization files.

All data from sampling and analysis required to support waste characterization are included in the MEF waste characterization files. This typically includes the request for analysis, sampling plan, field sample log book, analytical data report, QA/QC report, chain-of-custody forms, and statistical treatment of analytical data once the sampling and analysis is completed.

### 3.0 SEGREGATION DESCRIPTION

This section provides a detailed description of the Waste Segregation processes for identified waste containers and presents process control measures, waste management/minimization activities, facility descriptions, project schedule, and decontamination/demobilization activities.

#### 3.1 SEGREGATION OBJECTIVES

Waste segregation will be the first treatment process initiated under the Chemical Treatment Project. The primary goal of this operation is to remove debris from non-debris waste categories and remove anomalies. The secondary goal is to split debris into smaller more defined subcategories. This results in the selective splitting of heterogeneous waste streams into more homogeneous waste streams. Waste containers have been assigned to current waste categories based on similar matrices, characteristics, and hazardous constituents. RTR results indicate some containers contain wastes from two or more categories. To resolve potential treatment problems, segregation is required to place the wastes into the proper waste categories. Segregation will allow waste to be treated efficiently in subsequent treatment processes.

#### 3.2 SEGREGATION CATEGORIES

All waste in the Chemical Treatment Project inventory has been placed into initial general waste categories. Descriptions of these categories and the MEFs included in the project are provided in Section 2.0 of this document. Waste categories are based on the waste matrix, characteristics, and constituents to be treated.

##### 3.2.1 Applicability of Segregation Process

RTR and visual inspections have indicated that some containers contain waste that could be grouped into more than one waste category. The segregation process will be used to identify anomalies and transfer them to the appropriate waste category.

The first step in the segregation process is to identify which containers require segregation. RTR results, visual inspections, and process knowledge are being employed to evaluate each waste container in the Chemical Treatment Project to determine which containers require physical segregation. This is being performed as a screening measure to limit the number of containers which must be handled. Waste will not be physically segregated if it is determined that segregation would not be beneficial. This determination will be primarily based on the homogeneity of the waste and the absence of anomalies. The screening will primarily identify waste containers with debris. Waste containers which contain homogeneous waste without debris will not be processed through waste segregation.

##### 3.2.2 Waste Batches

Waste segregation of both debris and non-debris wastes will take place in two

distinct batches including:

- Batch 1 - Wastes with no D018 - D043
- Batch 2 - Any wastes with D018 - D043

Although all the waste will be processed within these batches, the primary purpose of the batches is to allow segregation of non-debris wastes which have different treatment requirements based on EPA waste codes. Non-debris solids categorized as D018 - D043 wastes will be treated separately since they must meet the Subpart D Treatment Standards (40 CFR 268.40) and all underlying hazardous constituents must meet the Universal Treatment Standards (40 CFR 268.48). The other wastes only need to meet the Subpart D Treatment Standards. Listed wastes will be processed through waste segregation. They will be incorporated into Batch 1 unless they also contain D018 - D043 waste.

### 3.2.3 Waste Segregation Sub-Categories

Currently the waste has been categorized into eleven general waste categories in the Chemical Treatment Project. Some of the waste categories will be broken down into more specific subcategories based on the treatment processes required to meet the LDR standards and the disposal facility WAC.

Table 3-1 summarizes the expected waste segregation categories and subcategories which will be part of the segregation project. The waste segregation subcategories may change as the treatment technologies are developed and refined. Additional subcategories will be established as required based on the unique treatment needs of a waste stream.

### 3.2.4 Management of Mixed Waste Containers

The Waste Segregation Project involves container management at most stages of the process. Mixed waste at the FEMP site is packaged in containers of various sizes, ranging from 5-gallon pails up to 90 cubic feet white metal boxes. In some cases, containers are repetitively overpacked into larger containers to control leaks. The containerized wastes are characterized and classified in waste categories which are documented in individually numbered MEFs. The containers are packaged, labeled, marked, and managed in accordance with RCRA requirements in RCRA storage facilities on the FEMP site.

Segregated waste will be controlled and tracked throughout the process to assure proper handling and storage. Control of waste segregation efforts is required to prevent commingling of incompatible waste streams. Available waste stream information will be reviewed including RTRs, visual inspections, process knowledge, existing analytical data, and hazardous constituents to assure only compatible waste streams are processed. Tracking of each container entering the segregation process, the segregated waste streams and the secondary waste generated is required for further treatment processing

TABLE 3-1  
WASTE SEGREGATION CATEGORIES AND SUBCATEGORIES

WASTE CATEGORY/SUBCATEGORY DESCRIPTION	BATCH #1	BATCH #2
<b>DEBRIS</b>		
Soft Solids - Rags, Pads, Soft Plastic, Tarps, Drum Liners, Tyvex, PPE, Gloves, Rubber, Paper, Filter Cartridges, Cloth, Rope, Shoes	X	X
Shreddable Solids - Wood, Brick, Rock, Glass, Ceramic, Plastic	X	X
Rigid Solids - Metals, Hard Plastic, Plastic Jars and Jugs, Buckets	X	X
<b>FINES, SLUDGES, AND SOILS</b>		
Non-debris Solids with no D018-D043	X	
Non-debris Solids with D018-D043		X
<b>MERCURY WASTE</b>		
Mercury Batteries	X	X
Mercury Waste	X	X
<b>LEAD SOLIDS</b>	X	X
<b>Ni-Cd BATTERIES</b>	X	X
<b>CORROSIVES</b>		
Acidic Liquids	X	X
Caustic Liquids	X	X
<b>OTHER</b>		
Non-corrosive Liquids	X	X
Pressurized Containers	X	X
Light Ballasts	X	X
Empty Containers	X	X

purposes. Wastes from several MEFs will be consolidated into the subcategories discussed in Section 3.2.3 to increase treatment process efficiency. New MEF numbers will be assigned to the consolidated subcategories, as required. Records will be maintained to document which MEFs were consolidated. Only wastes comprised of similar contaminants and matrices and requiring similar treatment will be consolidated.

Waste containers will be reused when practicable. Markings on the drums to be reused will be covered with spray paint and new labels will be used. When used drums are not available, new drums will be used. Labeling will meet requirements pursuant to OAC 3745-59-50. Since the waste may be consolidated during the segregation process, some drums may not be reused immediately. These drums may be emptied, rinsed, as necessary, and staged for later use as required to replace damaged drums. Drums not reused in the segregation process will be rinsed, as necessary, to RCRA empty levels as defined in OAC 3745-51-07 and then crushed for disposal.

Waste which has undergone segregation and requires interim storage prior to further treatment will be packaged and returned to RCRA storage areas and managed as mixed waste.

### 3.3 WASTE SEGREGATION PROCESS

Waste segregation operations will be performed by the on-site work force. Work plans, procedures, and start up documentation will be developed by FEMP personnel. Criteria will be developed as a guideline for the segregation process. The primary goal of this operation is to remove debris from non-debris waste categories and remove anomalies. The debris will be further segregated into sub-categories. These sub-categories were determined based on the unique treatment needs of each sub-category, and are discussed in Section 3.2.3.

#### 3.3.1 Segregation Equipment

Equipment used in the segregation process consists of containment, process exhaust ventilation systems, sorting tables, forktrucks, vacuum pumps and disposal containers. Modifications may be made to the existing trash sorting tables to permit the use of drums in place of white metal boxes. A table will be added for placing uncategorized anomalies or accumulating small quantities of specific waste.

HEPA ventilation in the containment structure will be provided through intakes located near each of the sorting tables. The two sorting tables provide a large working area and are roughly waist high. The tables are equipped with an edge lip to contain liquids and loose solid materials and are tilted to drain liquids toward a spill containment container. The opposite end of the table will be modified in order to provide a tapered end through which to push nondebris solids into drums and appropriate ventilation modifications will be made. A floor plan of the work area is shown in Figure 3-1.

7512

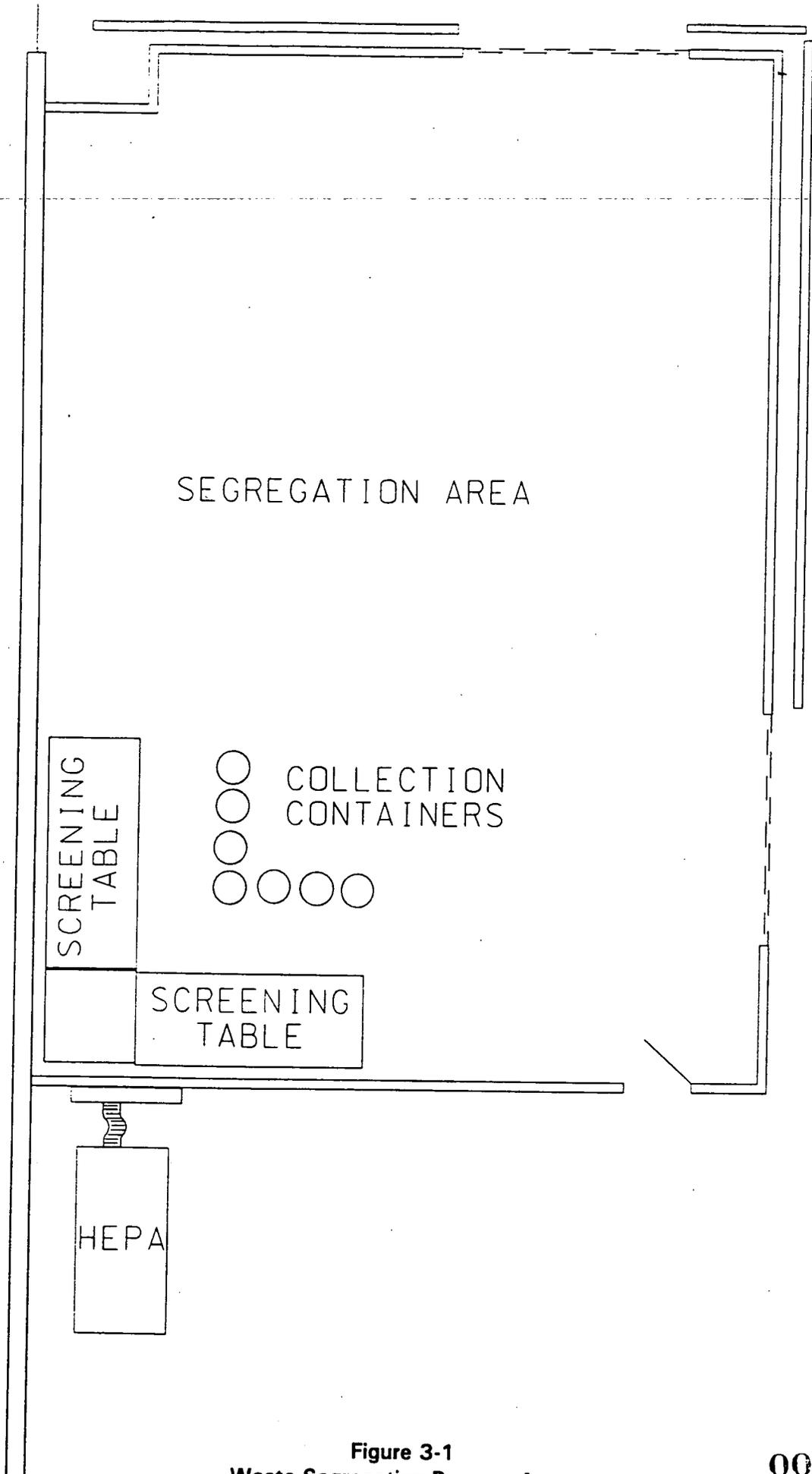


Figure 3-1  
Waste Segregation Process Area

000021

### 3.3.2 Segregation Personnel

All waste segregation activities conducted as part of the project will be performed utilizing FEMP personnel.

### 3.3.3 Segregation Process

Figure 3-2 provides a graphic depiction of waste segregation. The segregation process may include any of the following six primary steps:

- Visual observation
- Liquid removal
- Emptying waste container
- Sorting waste
- Waste consolidation and repackaging
- Waste tracking

#### 3.3.3.1 Visual Observation

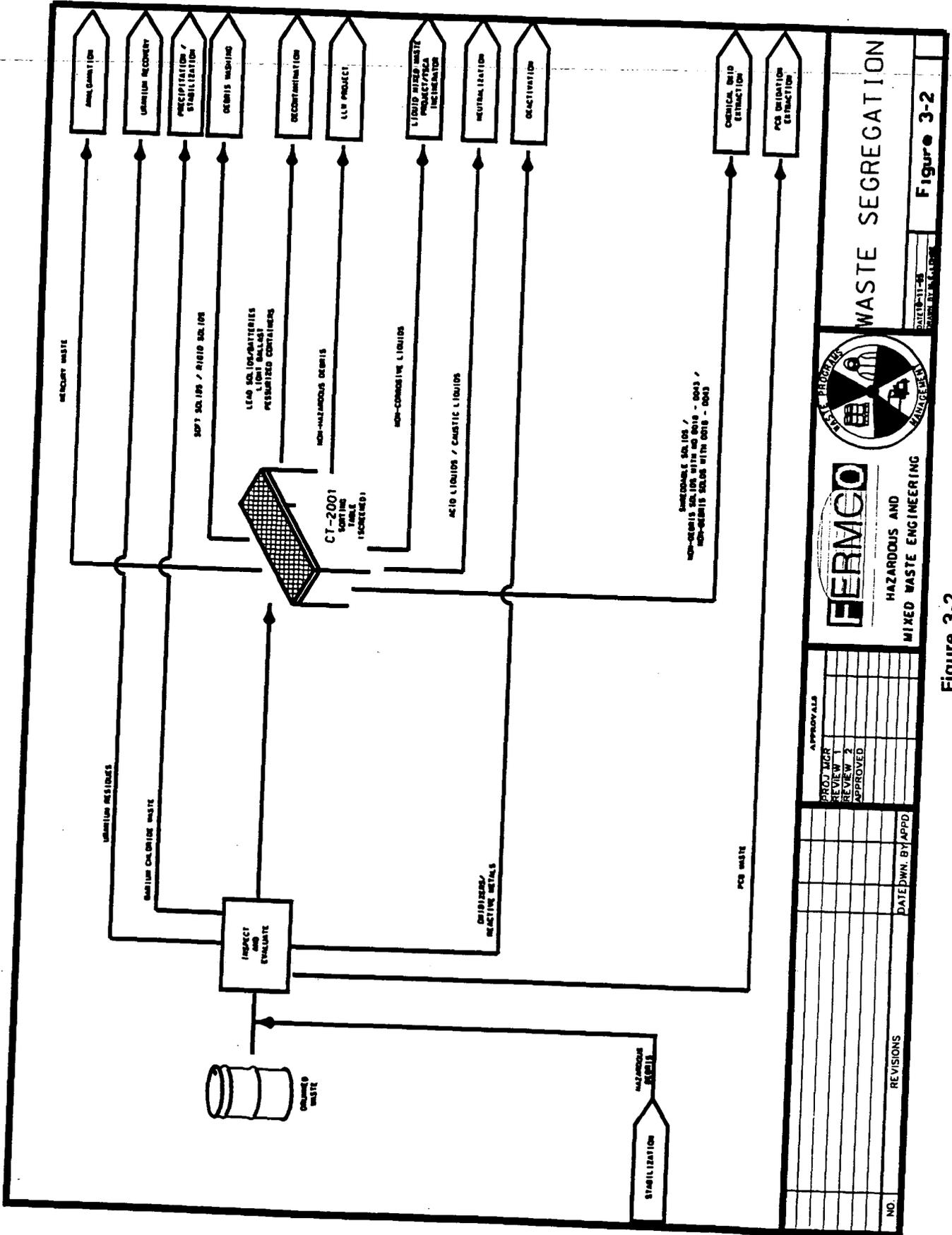
Visual inspection and evaluation is the first stage of segregation and will determine whether physical segregation of the container contents will be performed. Results from RTR will be reviewed prior to opening the container to support this determination. The lid of each selected container will be removed and the contents visually inspected and evaluated to determine whether debris, anomalies or unidentified hazards are present.

#### 3.3.3.2 Liquid Removal

The segregation process is not expected to encounter significant quantities of liquids. Where a significant quantity of free liquid is present, solids will be removed from the container and the liquid removed using a vacuum pump. The liquid that is removed will be transferred to an appropriate collection container and managed as hazardous waste pending evaluation of treatment options. Small quantities of liquids may be discharged onto the sorting table where they will drain to the containment container. These liquids will be collected, transferred into the collection drums and stored for future treatment.

#### 3.3.3.3 Emptying Waste Container

The contents of the waste container will be emptied onto one of the two sorting tables. Smaller containers (less than 35 pounds) can be emptied manually. Larger containers (greater than 35 pounds) will be inverted with the assistance of a forklift or other lifting device. Care will be taken



WASTE SEGREGATION



**FERMCO**  
HAZARDOUS AND  
MIXED WASTE ENGINEERING

APPROVALS

PROJ MGR	REVIEW 1	
	REVIEW 2	
	APPROVED	

NO.	REVISIONS	DATE	BY	APPD.

Figure 3-2

Figure 3-2  
Waste Segregation Process

to minimize splashing or generation of dust.

#### 3.3.3.4 Sorting Procedure

Within each batch, non-debris and debris will be segregated and evaluated for consolidation into the appropriate waste subcategory. Only waste with similar contaminants and matrices requiring similar treatment will be consolidated (i.e., solvent contaminated waste with other solvent contaminated waste). Debris which is inherently wastelike (i.e., lead solids, Ni-Cd batteries, or mercury batteries) will be removed, wiped down to remove other potential hazardous constituents and placed into the proper waste category for further treatment. The material used for wipe down will be placed in the appropriate waste segregation collection container. Empty containers will be placed in a separate waste category as a nonhazardous waste.

Materials which do not match the established sub-categories will be set aside and evaluated to determine a proper waste category. If a proper category cannot be identified, a new waste stream will be created.

#### 3.3.3.5 Waste Consolidation

The amount of free space in each consolidation container will be minimized by consolidating materials from multiple waste drums and MEFs. This process will decrease the overall quantity of drums which will be stored for eventual treatment using one or more of the treatment technologies identified under the Chemical Treatment Project.

#### 3.3.3.6 Waste Tracking

Wastes consolidated from multiple MEFs will be tracked under a new MEF based on the waste categories shown in Table 3-1. Existing MEFs will be used if applicable to a waste category. A Consolidated Drum Packing List, as shown in Figure 3-3, will be kept for each drum to track the waste consolidated in each container. This form may be modified slightly as additional tracking needs are identified. The list will include the accumulation start date, the original MEF number, the type of waste, and all the waste codes from the original characterization except those which are matrix specific (i.e., ignitable liquids [D001], and corrosive [D002]). Waste codes will not follow the waste subcategory of empty containers.

Full consolidation containers will be returned to storage to await treatment at a later date. Prior to storage, the drums will be properly labeled to comply with RCRA storage requirements and on-site waste tracking requirements. The waste characterization of these containers will be managed by tracking all appropriate waste codes into the new MEF. This tracking mechanism for in-process waste will eliminate the need to



perform extended waste characterization. Waste segregation is the first step of the treatment train for the waste in the Chemical Treatment Project. After being processed through the segregation step, these wastes will be returned to RCRA storage to await future treatment using one or more of the treatment technologies described in the Chemical Treatment General CERCLA Work Plan. Due to the multiple treatment processes which will be implemented to complete the Chemical Treatment Project, wastes may be stored for several years awaiting further treatment. Segregated containers will therefore be returned to RCRA storage areas which provide in-place controls and regular inspection schedules until final treatment is performed.

### 3.4 PROCESS CONTROL

Positive control of the process by which waste is segregated is a critical part of the overall Chemical Treatment Project. Activities associated with the segregation process will be monitored and the necessary corrective actions will be taken to assure that activities are proceeding according to this work plan. Implementation of process control involves two major activities. The first is measuring the effectiveness of the segregation activities. The second is identifying deviations from planned performance and taking actions to make the necessary corrections.

Maintaining project documentation is critical to maintaining the identity of waste streams as they pass through the segregation process. The primary process control document is the Consolidated Drum Packing List. This will assist in tracking the origin and content of the waste. Additionally, field operations log books will be maintained throughout the project.

The effectiveness of the segregation process will be based on the ability to create more defined waste streams which will simplify the required treatment processes. If the resulting consolidated waste streams are not homogeneous or a large quantity of the waste does not fit into the established categories, waste segregation activities will be re-evaluated. Qualified personnel will evaluate unknown materials. Evaluations may include visual appearance, pH (evaluated using pH paper), organic content (evaluated using photoionization meter) or other field analysis as appropriate. Based on the results of the field tests the material may be consolidated into an existing waste category, placed in a new category or set aside for additional study.

### 3.5 ENVIRONMENTAL MANAGEMENT

This section describes environmental management measures for the segregation process. The following discussion focuses on minimizing waste generation and protecting the environment.

### 3.5.1 Waste Minimization

Waste minimization is an important cost saving activity to all projects. Waste may be minimized in the segregation process through preventing unnecessary contamination of material, equipment, and site facilities. Site waste minimization controls and procedures will be implemented to ensure waste minimization is realized.

All items used in the radiological control area have the potential to become radioactively contaminated, therefore, the project team must minimize materials, and equipment brought into the project control area. An aggressive pollution prevention program will be implemented by project personnel to prevent material and equipment contamination associated with the segregation process. Contaminated equipment will be decontaminated to the extent possible to meet free release limits.

Another example of waste minimization practices which will be incorporated as part of this project is the reuse of drums. As practicable, the segregated materials will be consolidated back into waste drums in order to avoid contaminating new drums and eliminating the need to dispose of waste drums that are structurally sound.

The process area is likely to have fixed contamination from past uranium processing. It is unlikely the mixed waste segregation process will result in significant additional contamination of the process area. In areas where spills or leaks of liquid waste to the building floor could occur, drip pans and Herculite™, or equivalent floor covering, will be used to provide a contamination barrier.

### 3.5.2 Prevention of Environmental Media Pollution

Potential discharges of pollutants to soil, surface water, groundwater, storm sewer systems, and the atmosphere will be minimized to the extent practical. Section 4.0 of this work plan describes the permitting and regulatory issues regarding emissions to the environment.

To reduce the risk of discharge to soil and groundwater, segregation activities will be performed within a contained area. The process area will be surveyed to identify any potential points of interface between the building floor and the ground outside the building or the storm sewer system. Handling and storage of incompatible wastes will follow the procedures in the FEMP RCRA Part B Permit Application.

Wastewater generated during segregation operations other than those consolidated from the containers will be accumulated and managed as hazardous waste pending RCRA characterization. Wastewater deemed acceptable to discharge under Site Procedure EP-0005 - "Controlling Aqueous Wastewater Discharges into Wastewater Treatment System" will be discharged to the existing WWTF for treatment. Wastewater unacceptable for discharge through this system will be evaluated for further disposition (i.e., TSCA Incinerator).

Dust and fume process exhaust collection systems will be used to draw air from fugitive dust zones by the sorting tables and discharge through a prefilter and a high efficiency particulate air (HEPA) filter. Permitting and regulatory issues relating to air emissions are presented in Section 4.0 of this work plan.

### 3.5.3 Spill Prevention and Emergency Response

Care will be exercised at all times to prevent spills from occurring inside or outside the process area. When spills or leaks do occur, prompt response action will be taken by the project team to contain and clean-up the spill, with all recovered materials being properly managed as recyclable materials or as wastes. Spill response will be in accordance with the following FEMP site plans and procedures:

*FEMP RCRA Contingency Plan*

*FMPC Spill Prevention Control & Countermeasure Plan (PL-2194)*

*Spill Incident Reporting and Clean Up (EP-0004)*

Spills will be reported to the Area Supervisor and Assistant Emergency Duty Officer (AEDO).

Waste Operations personnel will respond to all spills or releases within the exclusion zone. Spill kits, containing dry absorbent granules, pads and booms, will be located in the exclusion zone close to areas of potential spills or leaks. In the event of a large spill, or a spill that causes a condition immediately dangerous to life or health (IDLH), project team personnel will evacuate the exclusion zone, notify the Fernald Emergency Response Team, and stay outside the exclusion zone until the condition is resolved. Portable fire extinguishers will be in accessible locations for emergency response.

### 3.5.4 Waste Management and Disposal

As discussed in Section 3.5.1, generation of secondary wastes will be minimized to the extent practical. Decontamination and recertification of PPE items such as respirators, outer boots, and gloves will be used to the extent practical. Disposable PPE will be placed into the appropriate collection drums for the subcategories. The FEMP will manage project waste under site procedure EW-0006, *Management of Excess Soil, Debris and Waste from a Project*. RCRA empty drums which are not reused in the segregation process will be sent to the on-site drum crushing facility.

The project team will manage all waste materials in accordance with ARARs, site procedures and plans established for each treatment process. Compliance with ARARs is discussed in Section 4.0.

#### 3.5.4.1 Facility and Container Inspections

Inspections of waste containers and equipment in the segregation area will be conducted and documented daily as specified in OAC 3745-65-15

(40 CFR 265.15). Inspections in container storage or staging areas includes, but will not be limited to, inspection of containers for leaks, damage, indications of over pressure, loose or illegible labels, aisle spacing, and waste compatibility. Also, the presence and accessibility of adequate quantities of emergency response equipment will be verified.

### 3.6 FACILITIES AND EQUIPMENT

This section describes the facilities and equipment that will be used to segregate mixed waste. Water, electricity and local phone service are available at the FEMP. All tools, vehicles, and equipment will be inspected for radioactive contamination prior to initial entry and upon removal from the segregation area as required.

#### 3.6.1 Processing Facilities

The FEMP is located near Fernald, Ohio, approximately 20 miles northwest of downtown Cincinnati as shown in Figure 3-4. The total area of the site is 1,050 acres of which 850 acres are in Hamilton County and 200 acres in Butler County. Figure 3-5 is an illustration of the FEMP site.

##### 3.6.1.1 Process Area

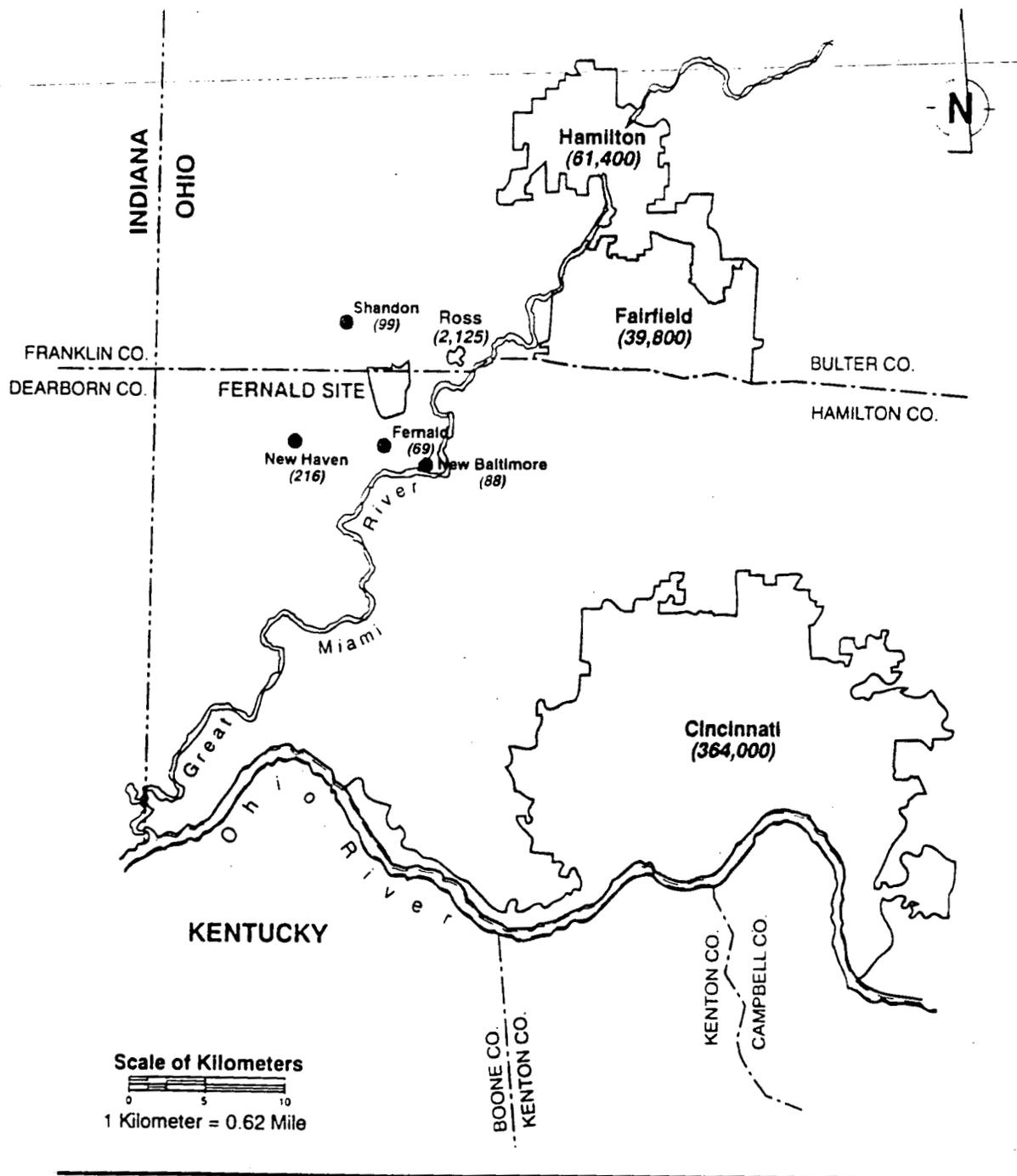
Waste segregation will be performed in Building 71 and will utilize the equipment currently being used for the legacy waste segregation process. Figure 3-1 shows the basic equipment layout for segregation activities. The portion of the building used for the process area will have appropriate overhead clearance. The floor will safely support vehicles and equipment in the area. Secondary containment pans and basins, and Herculite™ floor coverings will be used in locations where a potential exists for liquid spills or leaks. Otherwise, the floors will remain uncovered. Appropriate housekeeping measures will be provided to prevent accumulation of contaminants on the process area floor.

##### 3.6.1.2 Exclusion Zone

The exclusion zone is the area that will be restricted to project personnel, authorized FEMP personnel and visitors specifically authorized and qualified to enter. Qualifications for entry will be established in accordance with the site procedures developed for the segregation process. Personnel entering the exclusion zone must be properly dressed and must comply with all other posted entry requirements.

##### 3.6.1.3 Incoming Waste Staging Area

The incoming waste staging area will be located inside the work area, inside the exclusion zone, or in close proximity to the work area. Adequate containment (i.e. Herculite diking, portable containment devices) will be provided to control spills or leaks from the containers.



**LEGEND**

- Population in parenthesis estimated in 1989
- Population in parenthesis from 1990 U.S. Census Figures

**Figure 3-4  
FEMP Location Map**

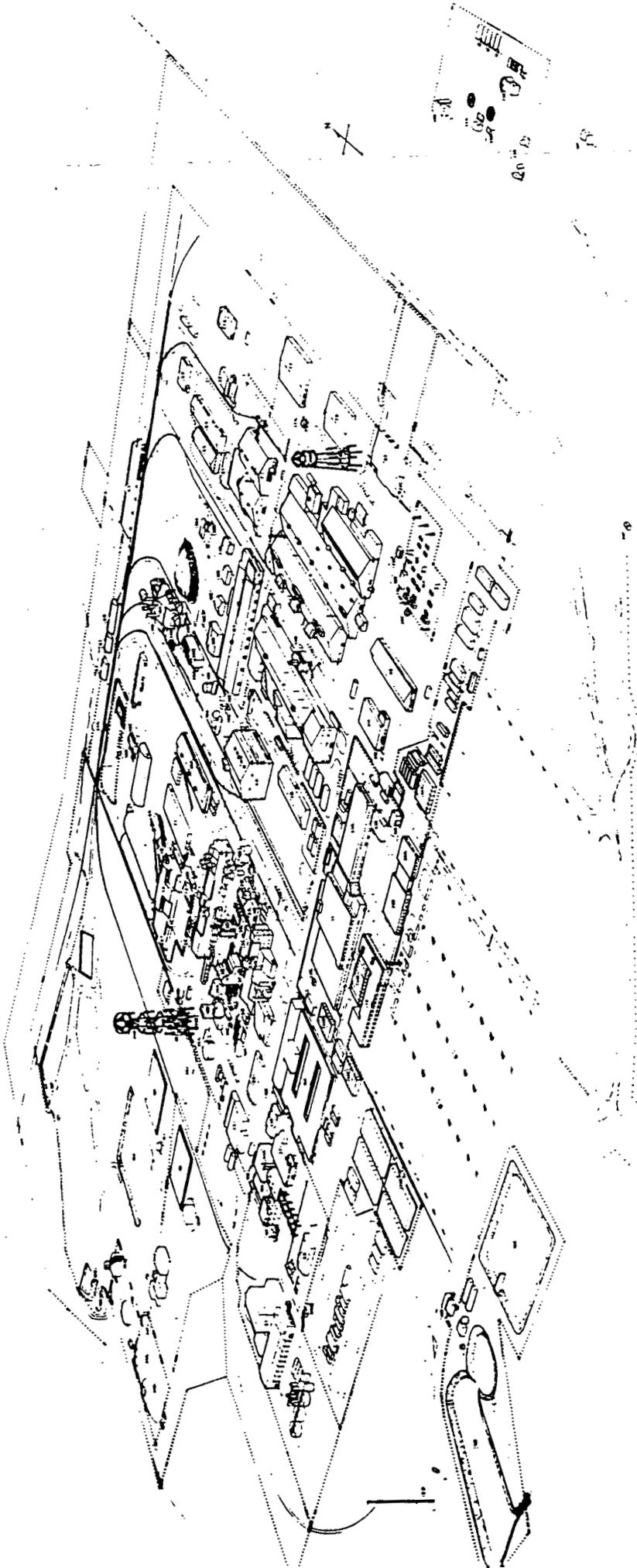


Figure 3-5  
FEMP Site Map

#### 3.6.1.4 Emission Control and Off-Gas Operations

An exhaust fan will draw a flow of air sufficient to provide adequate velocity to capture dust, gases and vapors that may be generated by segregation activities. The intake and its downstream duct network will be connected to a HEPA ventilation unit. The HEPA unit will also be equipped with a prefilter.

### 3.7 PROJECT SCHEDULE

A master schedule showing approximate order and time frame for performing waste segregation is provided in Figure 3-6. The schedule provides a logic sequence for waste segregation implementation. Segregation will commence in March 1996 and will last approximately three months.

### 3.8 DECONTAMINATION ACTIVITIES

The primary method of decontamination during operations will be performing surface wash and rinse of nonporous items using a cleaning solution, followed by a clean water rinse. This method will be applied to decontaminate equipment and tools when necessary. These methods will also be used for area cleanup and housekeeping, as required. Recovered wash and rinse solutions will be collected and evaluated for disposition in the WWTF.

At the end of the project, the process area and all reusable equipment will be decontaminated in accordance with DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, and FEMP site procedure RP-0009, *Radiological Requirements for the Release of Materials at the Fernald Environmental Management Project*. Dry vacuum, solution flush, triple-rinse, and surface wipe procedures will be used as appropriate in final decontamination of the equipment and process area. Accumulated decontamination waters will be held pending waste characterization.

#### 3.8.1 Decontamination of Equipment Prior to Use

New equipment is considered free of contamination from hazardous or radioactive waste. No survey or measurements will be made unless specifically requested. Before any previously used equipment is used on the project, it must be surveyed for radiological contamination and decontaminated, if necessary to protect against cross contamination. Radiologically contaminated equipment will be surveyed to determine and document the extent of contamination. Additional information is required before radiologically contaminated equipment may be brought onto the site. This includes the radioactive isotope, whether the contamination is fixed or removable, source or location of contamination, and level of contamination.

#### 3.8.2 Decontamination for Routine Good Housekeeping

FEMP Radiological Control technicians perform routine surveys of contamination in the facility. If contaminants are detected on floors or work surfaces in the work



area exceeding limits for the posted area then the surfaces will be promptly decontaminated.

### 3.8.3 Decontamination of Reusable Equipment and Process Area Post Processing

For purposes of this work plan, all process equipment is considered to be reusable under Ohio EPA Closure Plan Review Guidance for RCRA Facilities. After completion of waste segregation, reusable equipment which has become contaminated with waste constituents shall be decontaminated. Decontamination will consist of a triple rinse to remove contamination. The rinsate will be drummed, characterized and evaluated for final disposition. Reusable equipment will be surveyed for radiological contamination by FEMP Radiological Control for free release, if applicable. If equipment requires further decontamination to meet free release criteria, it will be steam cleaned, pressure washed or scrubbed, prior to resurveying.

The triple rinse process will be considered complete decontamination of reusable equipment for the purposes of RCRA in accordance with OEPA Closure Plan Review Guidance. Decontamination waters will be bulked for storage pending characterization and evaluation for treatment through the FEMP WWTF or shipped and incinerated at the TSCA Incinerator.

Wipe methods may also be used to enhance the effectiveness of decontamination. Drop cloths used during decontamination activities will be rolled to the inside and taped for reuse. Visual floor contamination will be removed by the same wash and rinse methods, except that the wash and rinse solutions will be collected using HEPA wet-vacs. FEMP Radiological Control technicians will confirm that the process operations have not significantly increased fixed and removable contamination levels by repeating the measurements made in the baseline survey. If contamination exceeding baseline levels occurs, FEMP Radiological Control personnel will specify further decontamination.

Contaminated equipment intended for further use in the processing of mixed or radioactive waste does not require decontamination to limits for unrestricted use. Contaminated equipment is restricted to use only in the treatment of mixed or radioactive wastes. Release of any equipment for unrestricted use will be considered on a case-by-case basis at the time it is proposed for release.

## 4.0 ENVIRONMENTAL COMPLIANCE

The Chemical Treatment Waste Segregation Project is the first process being initiated under the Chemical Treatment Project General CERCLA Work Plan. Waste segregation will be accomplished by site personnel using the existing segregation equipment located at the FEMP. The project will comply with all other applicable or relevant and appropriate requirements (ARAR) established under federal and state environmental regulations.

### 4.1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)

Table 4-1 of this section identifies the ARARs for the Chemical Treatment Waste Segregation Project. As part of Removal Action (RA) No. 9, the segregation process conducted under the Chemical Treatment Project will be exempt from the requirement to obtain administrative permit approval under Section 121(e) of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as promulgated in 40 CFR 300.400(e).

Although on-site removal actions are exempt from the requirement to obtain administrative permit approval, Paragraph XIII.B of the Amended Consent Agreement requires DOE-FN to supply specific information regarding the permits that would have been required in absence of the CERCLA permitting exemption described above. To satisfy this Amended Consent Agreement requirement, the following three pieces of information have also been included in Table 4-1:

- Identification of permits that would be required in absence of the CERCLA Section 121(e) exemption.
- Identification of the standards, requirements, criteria, or limitations (ARARs) that would have to be met to obtain the permits.
- An explanation of how the response act will meet the standards, requirements, criteria, or limitations identified above.

Representatives from the FEMP will conduct inspections during performance of this response action to ensure operations are conducted consistent with discussions in this work plan. Inspections will ensure equipment associated with the project is properly cleaned and decontaminated and wastes resulting from the project are properly stored, labeled, and characterized.

**TABLE 4-1  
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)**

PERMIT THAT WOULD BE REQUIRED	PERMIT REQUIREMENTS (ARAR)	COMPLIANCE PLAN
<p>National Emission Standards for Hazardous Air Pollutants - (NESHAP) - 40 CFR Part 61, Subpart H - Emissions of Radionuclides Other Than Radon From DOE Facilities</p>	<p>40 CFR 61.92: Radiological emissions (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 an effective dose equivalent of 10 mrem in any one year.</p> <p>40 CFR 61.07 and 61.96(b): An application for approval does not have to be filed for radionuclide sources if the effective dose equivalent caused by all emissions from the new construction or modification is less than 0.1 mrem per year.</p> <p>40 CFR 61.93(b): Continuous emission monitoring is required for stacks and vents that have the potential, under normal operating conditions, but without emission control devices, to release radionuclides in sufficient quantities to cause any member of the general public to receive an effective dose equivalent of 0.1 mrem/year or greater.</p>	<p>Dose estimates for the Chemical Treatment Waste Segregation Project will be included in the annual FEMP NESHAP Subpart H report. Emissions from the project will not exceed the annual 10 mrem per year standard to off-site members of the general public.</p> <p>An evaluation will be conducted to determine if continuous emission monitoring will be required for stacks and vents associated with the project.</p> <p>Radionuclide emissions from the project are not expected to cause any member of the general public to receive an effective dose equivalent of 0.1 mrem/year or greater.</p>
<p>National Pollutant Discharge Elimination System (NPDES) Permit - OEPA NPDES Permit No. 11000004*ED (OAC 3745-33-05)</p>	<p>Waste water discharges must not cause a violation of effluent limitations or loading rates at NPDES permitted outfalls. Discharges must be conducted in accordance with applicable terms and conditions of the permit. These include compliance with the notification requirements promulgated in 40 CFR 122.42 and OEPA water quality standards established under OAC 3745-1.</p>	<p>Discharges associated with the Chemical Treatment Waste Segregation Project will comply with the current FEMP NPDES permit. Wastewater generated from the project will be stored until characterization indicates the wastewater can be discharged to the FEMP wastewater treatment system. All discharges of wastewater associated with the project will be conducted in accordance with the requirements of site procedure EP-0005 - "Controlling Aqueous Wastewater Discharges into the Wastewater Treatment System".</p>
<p>Atomic Energy Act (10 CFR 835)</p>	<p>Radiation doses, levels, and concentrations in restricted and unrestricted areas.</p>	<p>Emissions from the Chemical Treatment Project will not result in the radiation limits being exceeded in restricted and unrestricted areas. Site procedures and project specific work permits will be used to ensure protecting site workers, the public and the environment.</p>

**TABLE 4-1  
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)**

PERMIT THAT WOULD BE REQUIRED	PERMIT REQUIREMENTS (ARAR)	COMPLIANCE PLAN
<p>Air Pollution Control - Permits to Install &amp; Permits to Operate (OAC 3745-31 and OAC 3745-35)</p>	<p>OAC 3745-31-05(A) Permits to Install: Installation of the proposed air contaminant sources must not prevent or interfere with the attainment or maintenance of applicable ambient air quality standards; and must not result in a violation of any applicable laws; and must employ the Best Available Technology (BAT) to control emissions.</p> <p>OAC 3745-35-01(C) - Permits to Operate: Air contaminant sources must be operated in compliance with applicable air pollution control laws; must be constructed, located, or installed in compliance with the substantive requirements of the permit to install; and must not violate NESHAP standards adopted by the Administrator of USEPA.</p>	<p>Air contaminant sources installed under the Chemical Treatment Waste Segregation Project will not interfere with the attainment of any applicable air quality standards or cause a violation of any applicable laws. BAT will be implemented in the form of HEPA filtration to control radiological particulate emissions.</p> <p>Process equipment will be operated in compliance with applicable air pollution control laws and will not violate applicable NESHAP Standards.</p>
<p>Safe Drinking Water Act (42 U.S.C. 300G; PL 93-523)</p>	<p>National Primary Drinking Water Regulations (40 CFR 141).</p> <p>National Revised Primary Drinking Water Regulations (40 CFR 141.60 through 141.63)</p> <p>Ohio Primary Drinking Water Regulations (OAC 3745-81)</p>	<p>Compliance will be demonstrated by site-wide environmental monitoring, including air, soil, and groundwater. Reports summarizing the site-wide monitoring results will be submitted to EPA.</p> <p>Surface water discharges will be conducted in accordance with the site NPDES permit and are not expected to impact groundwater quality.</p> <p>Engineering controls and best management practices will be used to mitigate the potential discharge of contaminated waste water to the underlying aquifer. The FEMP will ensure groundwater is not adversely impacted through continued monitoring under its existing Groundwater Monitoring Program.</p>
<p>Radiation Exposure to the Public</p>	<p>Radiation Dose Limit (40 CFR 192.02(b))</p> <p>Radiation Dose Limit (Drinking Water Pathway) (10 CFR 834)</p>	<p>The project will be designed and operated to minimize the releases of radionuclides. Compliance will be demonstrated by site-wide environmental monitoring, including air, soil, and groundwater. Reports summarizing the site-wide monitoring results will be submitted to the EPA.</p>

**TABLE 4-1  
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)**

PERMIT THAT WOULD BE REQUIRED	PERMIT REQUIREMENTS (ARAR)	COMPLIANCE PLAN
Resource Conservation and Recovery Act (U.S.C. 6901 et. seq.)	Hazardous Waste Determinations (OAC 3745-52-11) (40 CFR 262.11)	Wastes associated with the segregation project have been characterized in accordance with these requirements. Characterization of the segregated waste streams will be managed by tracking all appropriate waste codes, where possible, into the new MEF. Wastes generated from the project will be characterized in accordance with site procedure EW-0001 and the FEMP Waste Analysis Plan.
	Interim Status: Treatment, Storage, and Disposal General Facility Standards (OAC 3745-65-13 through 17) (40 CFR 265.13 through 265.17)	The Chemical Treatment Waste Segregation Project will be conducted in accordance with RCRA regulations. Existing site security measures will be utilized. Inspections will be conducted in accordance with RCRA regulations and existing site procedures. Personnel will be trained in accordance with FEMP requirements.
	Interim Status: Treatment, Storage, and Disposal Facility Preparedness and Prevention (OAC 3745-65-31 through 35, 3745-65-37) (40 CFR 265.31 through 265.35, 265.37)	Preparedness and prevention equipment, as specified in regulations, will be on-site, available, and in operating condition throughout the duration of the project. The existing FEMP site-wide internal communications/alarm systems will be used. Portable fire extinguishers and spill control equipment will be placed in accessible locations to assist in emergency response. Warning signs will be posted at the entrance to each process area. Containers and equipment will be inspected daily in accordance with existing site procedures.
	Interim Status: Treatment, Storage and Disposal Facility Contingency Plan and Emergency Procedures (OAC 3745-65-51 through 56) (40 CFR 265.51 through 265.56)	The existing RCRA FEMP Contingency Plan and Emergency Procedures will be followed for any hazardous waste emergency associated with the project.
	Container Storage (OAC 3745-52-34, 3745-66-70 through 77) (40 CFR 262.34, 265.170 through 265.177)	Containers of hazardous waste will be managed and inspected in accordance with regulatory requirements. Secondary containment will be provided for the drum storage areas and the sorting tables. Containers will be handled in a manner to prevent rupture, leakage, or spillage. Containers will be compatible with the material being stored and will remain closed during storage.
	Residue of Hazardous Waste in Empty Containers (OAC 3745-51-07) (40 CFR 261.7)	Containers used for the Chemical Treatment Waste Segregation Project will be considered empty in accordance with the requirements of this rule.

TABLE 4-1 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)		
PERMIT THAT WOULD BE REQUIRED	PERMIT REQUIREMENTS (ARAR)	COMPLIANCE PLAN
Resource Conservation and Recovery Act (U.S.C. 6901 et. seq.)	Land Disposal Restrictions (OAC 3745-59) (40 CFR 268)	LDR requirements are applicable in determining waste segregation categories and subcategories. Waste stream segregation allows for proper treatment of the waste to meet LDR treatment standards and disposal facility WAC.
	Reusable Equipment Decontamination (OEPA Closure Plan Review Guidance for RCRA Facilities) pg 27-28	Decontamination of reusable equipment is discussed in Section 4.10 of this Work Plan. Reusable equipment contacting waste will be triple rinsed in accordance with OEPA Closure Plan Review Guidance.
Occupational Worker Protection & Training (29 CFR 1904 & 1910)	All facility personnel will be trained. Employers will develop and implement a written safety and health program for employees involved in hazardous waste operations.	The Chemical Treatment Waste Segregation Project will be conducted in accordance with existing site procedures and the requirements of applicable site work permits.
National Environmental Policy Act (NEPA) (10 CFR 1021)	Ensure that all federal agencies (including DOE) consider environmental impacts in the planning and decision-making phases of their projects.	On June 13, 1994 the DOE issued a revised policy statement on NEPA. The new policy allows DOE to rely on the CERCLA process to satisfy the procedural aspects of NEPA. To achieve the goals of this policy, NEPA values will be incorporated in the project through the CERCLA process.
DOE Orders	To be considered.	All project design activities shall be implemented according to existing site procedures.

## 5.0 HEALTH AND SAFETY

All work being conducted during this phase of the project shall follow any and all specified FERMCO procedures and permits. The waste segregation project will be completed in accordance with the waste segregation procedures- "Sorting Drummed Mixed Waste" which are currently being prepared. This work shall be conducted by FERMCO personnel.

### 5.1 REPORTING

#### 5.1.1 Emergency Numbers

Report all accidents and injuries to the Assistant Emergency Duty Officer (AEDO)

NAME	FEMP TELEPHONE NUMBER	RADIO CONSTRUCTION
Ambulance	648-6511	Control
Hospital		
Fire		
Security		
Emergency Response		
FERMCO HSO	648-4262	394
AEDO	648-4749/4444	202
Accountability	648-4111	Control

#### 5.1.2 Site Notification Procedures

All FEMP emergencies shall be reported to the FERMCO Communication Center to ensure rapid response. A means to report an emergency shall be available at all work locations whenever personnel are working. This may be accomplished by one of the following methods:

- Phone 648-6511
- Radio to "Control"

Employees working will be notified of emergency or abnormal conditions by the plant-wide alarm system and radio announcements. This announcement follows the sounding of the site alarm horn signal (3-3s).

### 5.1.3 What to Report

The following are **examples** of emergencies that would justify calling and reporting an emergency:

- Serious injury
- Injury complicated by contamination
- Chemical/radiation release
- Chemical splash (eye and/or skin)
- Fire
- Major property damage
- Unusual occurrence(s)

When an emergency or abnormal condition is observed, personnel shall contact the FERMCO Communications Center at extension 6511 or via radio (CONTROL) for emergencies/ Stay on the phone line until the dispatcher hangs up.

The following information must be given to the FERMCO Communication Center operator:

- Name and badge number
- Location where the emergency has occurred
- Nature of the emergency
- Number of personnel with injuries
- Unusual conditions (odors, symptoms, vapors, smoke)
- Current status of the emergency

## 5.2 EVACUATION ROUTES/ACCOUNTABILITY

### 5.2.1 Rally Point Accountability

Should a situation require an emergency evacuation of the work area, all equipment should be turned off (if possible) and left in place. All personnel are to proceed to their assigned rally point. If a situation arises that would require personnel to evacuate a building due to an emergency, personnel shall bypass personnel monitoring.

## 5.3 EMERGENCY EQUIPMENT

The FERMCO site has the capability and equipment to respond to medical, fire, chemical, and radiological emergencies.

## 5.4 EMERGENCY RESPONSE

FEMP Emergency Services will handle all on-site emergencies. Any request for emergency help should be requested by telephone at (648-)6511 or on any FEMP radio frequency by calling "CONTROL."

#### 5.4.1 Medical Emergency

Any injury, no matter how minor, shall be reported immediately to the FERMCO Medical Department for evaluation or treatment. The injured employee shall be accomplished to medical for evaluation and treatment by the employee's supervisor.

The FERMCO Medical Department is located at the east end of the first floor of the Safety and Health Building (Building 53). Personnel may enter this building through the rear entry way when reporting an injury that occurred on the process side.

The FERMCO Medical Department and emergency site ambulance shall serve as the first-aid responder.

Monitoring for personnel contamination shall not delay prompt medical attention. Deviation from procedures governing personnel monitoring is permitted under medical emergency situations.

#### 5.4.2 Fire Emergencies

All work sites shall maintain effective communication to summon fire fighting assistance. Access to the work area shall be maintained at all times to permit fire fighting crews to safely approach the fire emergency.

Only trained personnel shall attempt to operate fire fighting equipment and only when the fire is clearly within the capability of the fire fighting equipment.

The FEMP Emergency Reponse Team (ERT) will also respond to all on-site fire emergencies. For any fire emergency at the FEMP, call (648-)6511 or radio "CONTROL."

#### 5.4.3 Releases

The supervisor-in-charge, AEDO, RCT, and the FERMCO HSO shall be notified of the release.

### 5.5 TRAINING

- Lead Worker Training
- Hazard Communication Training
- Material Safety Data Sheets
- Radiological Worker II Training
- General Employee Training
- Site Worker Training
- Respirator Training
- Site Energy Control (OP-0004)
- Medical Monitoring Program
- Applicable Site Procedure Briefings

**5.6 MEDICAL SURVEILLANCE**

All personnel engaged in the performance of project field activities and on site more than ~~five days, are required to participate in the FEMP medical monitoring program.~~ This program shall include invivo whole body monitoring and the routine urine monitoring program.

Hazwats performing Waste Segregation activities shall participate in the Blood Lead monitoring program.

## 6.0 PROJECT MANAGEMENT

### 6.1 ORGANIZATION

An organizational structure has been established for oversight of the segregation process. The structure will be developed to assure all functional areas are covered and will operate as a unit under the leadership and direction of the project manager. The organizational structure is summarized in Figure 6-1.

### 6.2 WORK BREAKDOWN STRUCTURE

The Work Breakdown Structure for the segregation process is shown in Figure 6-2. In the first phase, the ultimate product is a set of approved job plans, specifications, and procedures. In the second phase, segregation activities are performed.

### 6.3 LOGIC DIAGRAMS

The general progression of work activities for the segregation process is shown on the logic diagram in Figure 6-3.

### 6.4 QUALITY ASSURANCE

The following Quality Assurance Program Criterion will be incorporated, as required, in the development of each treatment process, as described by FEMP Quality Assurance Program Description (RM-0012).

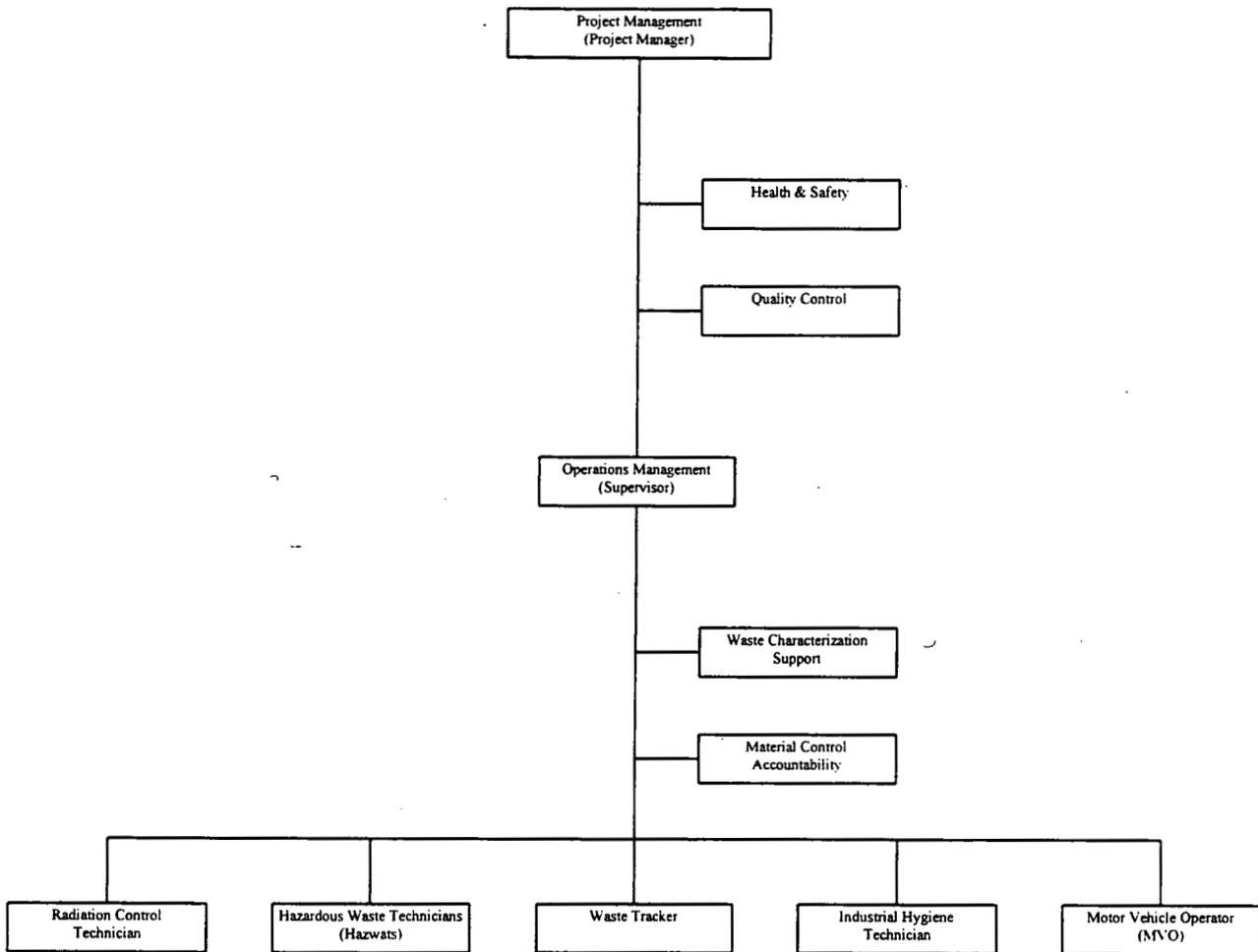
#### 6.4.1 Criterion 1 - Program

This criterion describes requirements for an organization to develop and maintain an effective management system. The management system shall include methods of managing, performing, and assessing adequacy of work, including work assigned to parties outside the organization.

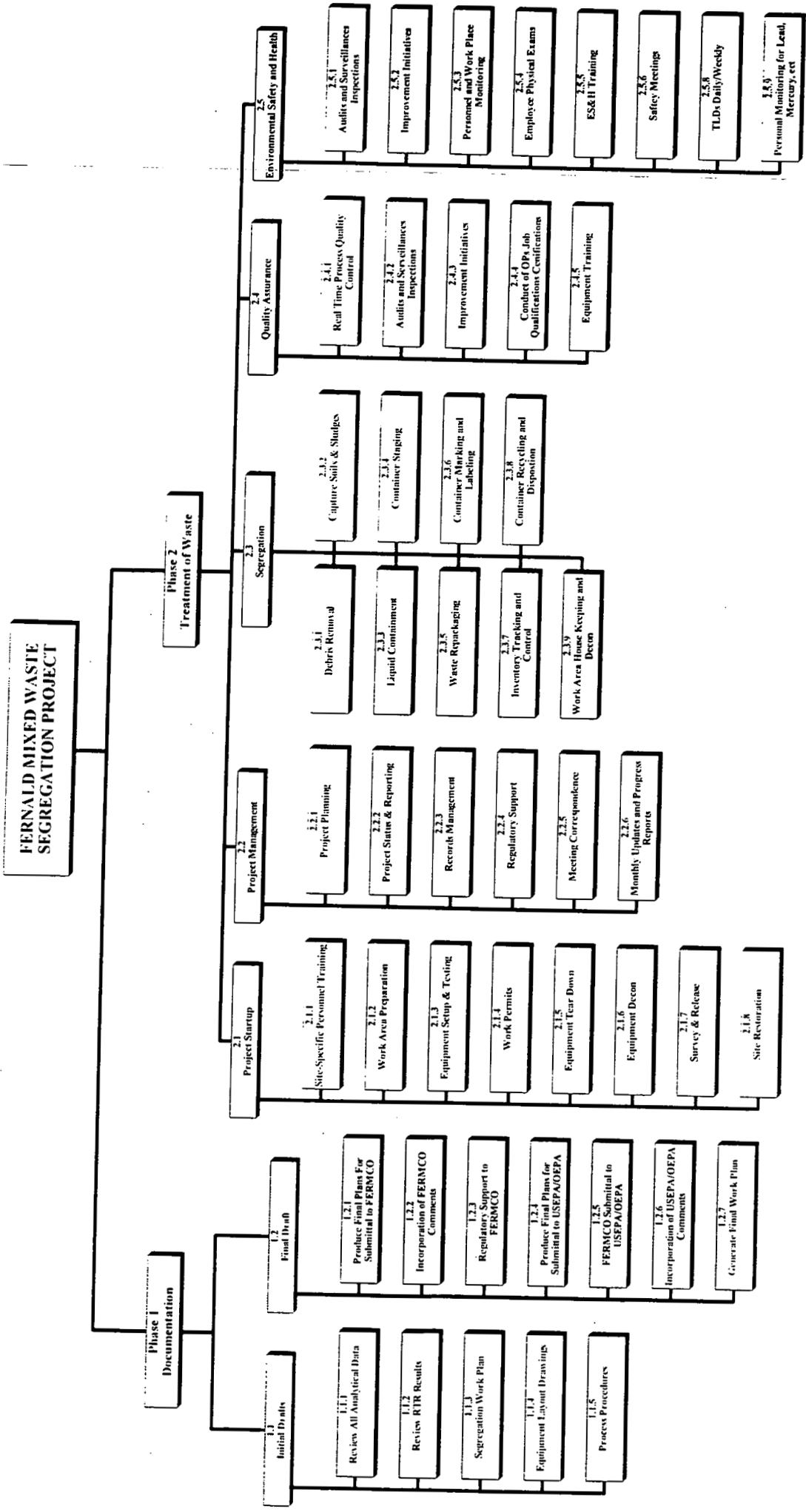
The quality of items and processes are ensured to an extent consistent with their potential impact on safe and reliable operation of the project. A graded approach, as specified in Appendix D of RM-0012 - Graded Approach for Quality Levels, shall be used to ensure resources applied are commensurate with the importance of the result to the achievement of site goals.

Readiness reviews shall be performed prior to initiation of major work activities identified to require readiness review. These readiness reviews will verify the following:

- Work prerequisites are satisfied, including regulatory compliance issues.
- Detailed technical and QA procedures have been reviewed for adequacy and appropriateness.



**Figure 6-1**  
**Organizational Structure**  
**Waste Segregation Process**



7512

Figure 6-2  
Project Work Breakdown Structure  
Waste Segregation Project

000046

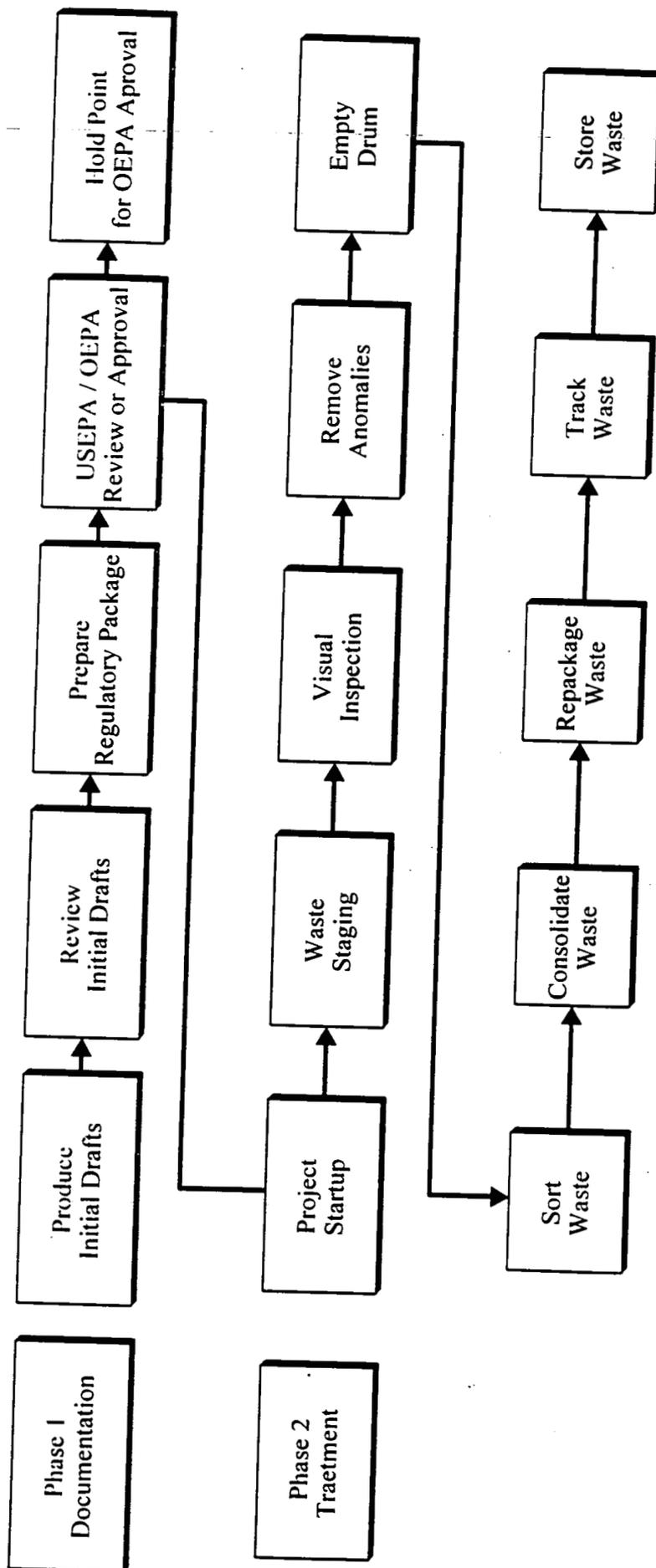


Figure 6-3  
Logic Diagram  
Waste Segregation

- Training programs are in place.
- Personnel are suitably trained and qualified.
- Proper equipment, material, and resources are available.

The Project Manager shall identify the responsibility and authority to stop unsatisfactory work and control further processing, delivery, installation, or use of nonconforming items such that planning and schedule considerations do not override safety, quality, or environmental considerations. A readiness review using a graded approach shall be performed prior to restarting work affected by a stop work order.

#### 6.4.2 Criterion 2 - Personnel Training and Qualification

This criterion describes project requirements for personnel to be trained and qualified to ensure they are capable of performing their assigned work. Personnel shall be provided continued training to ensure that job proficiency is maintained.

All personnel shall be capable of performing their assigned tasks. Training requirements shall be identified for all personnel. Training shall prepare the employee to perform the job, as well as, maintain and promote progressive improvement and employee satisfaction. Qualification requirements (experience, education, and training) shall be documented for each position as required.

#### 6.4.3 Criterion 3 - Quality Improvement

This criterion describes the requirements for establishing and implementing processes to detect, control, correct, and prevent quality problems and to promote quality improvement.

#### 6.4.4 Criterion 4 - Documents and Records

This criterion describes the requirements for establishing and implementing a system for the control of documents and the handling, collection, storage, and control of records generated at the project.

A system shall be established and implemented to control preparation, review, approval, issuance, use, and revision of documents that establish policies, prescribe work, specify requirements, or establish design. The scope of the document control system shall be defined.

Revisions to controlled documents shall be reviewed and approved by the organization that originally reviewed and approved them. An alternative organization may be designated based on technical competence and capability.

#### 6.4.5 Criterion 5 - Work Processes

This criterion describes the requirements for the control of processes affecting all work processes of this project. A work process includes all activities involved in performing defined tasks to achieve an objective. Work processes may include activities as planning, scheduling, accounting, project management, design, analysis, fabrication, procurement, construction, installation, testing, operation, modification, maintenance, and decommissioning.

The purpose of work process control is to ensure that standard processes and special processes are accomplished under controlled conditions. These standard processes and special processes include, but are not limited to: waste handling, packaging or environmental data operations.

Items shall be identified and controlled to ensure their proper use. Items shall be maintained to prevent their damage, loss, and deterioration. Equipment used for process monitoring or data collection shall be calibrated and maintained.

Work related instructions, procedures, and other forms of direction shall be developed, verified, validated and approved by technically competent personnel, and shall be provided to employees doing the work.

Work shall be performed to established technical standards and administrative controls. Work shall be planned, authorized and accomplished under controlled conditions using technical standards, instructions, procedures, or other appropriate means of detail commensurate with the complexity and importance of the work.

#### 6.4.6 Criterion 6 - Design

This criterion does not apply to the Waste Segregation process.

#### 6.4.7 Criterion 7 - Procurement

This criterion does not apply to the Waste Segregation process.

#### 6.4.8 Criterion 8 - Inspection and Acceptance Testing

This criterion does not apply to the Waste Segregation process.

#### 6.4.9 Criterion 9 - Management Assessment

This criterion describes the requirements for regularly assessing and documenting the adequacy and effectiveness of the QA program in providing the framework for FERMCO's achieving its mission and objectives.

Management at all levels are required to periodically assess the integrated QA Program and its performance, and to identify and correct problems that hinder the organization from achieving its quality objectives. These management assessments

should focus on whether the integrated QA management system is accomplishing the goal of continuous improvement of the safety and reliability of products and services to effectively meet the expectations of external and internal customers.

A program of planned and periodic management assessments has been established and implemented. Implementation of the program is to focus on how well the integrated QA Program is working by identifying barriers which hinder the organization from achieving its objectives in accordance with quality, safety, and environmental requirements.

#### 6.4.10 Criterion 10 - Independent Assessment

This criterion describes the requirements for the implementation of an independent assessment program. The FERMCO independent assessment program evaluates the adequacy and effectiveness of activities for compliance with applicable requirements.

The independent assessment process should use a performance-based approach with emphasis on results and with compliance viewed as the baseline. Assessments should be conducted on activities that most directly relate to final objectives and should emphasize safety, reliability, and product performance. Independent assessments may include such methods as inspections, peer and technical reviews, audits, surveillances, or combinations thereof.

Independent assessments shall be conducted using criteria that address environmental, safety and health, and remediation requirements. The assessments shall also describe acceptable work performance and promote improvement. They shall include an evaluation to determine whether technical requirements, not just procedural compliance, are being met.

Scheduling of assessments and allocation of resources shall be based on status, risk, and complexity of the item or process being assessed. Scheduling shall be flexible and additional attention shall be given to areas of questionable performance.

## 7.0 REFERENCES

~~Amended Consent Agreement Between DOE and U. S. EPA - 1991~~

ANSI/ANS-40.37-1993, Mobile Radioactive Waste Processing System

ANSI Standard 288.2-1980, *American National Standards Practices for Respiratory Protection*

ASME NQA-1, *Quality Assurance Program Requirements for Nuclear Facilities*, 1989 Edition

Comprehensive Environmental Response, Compensation, and Liabilities Act

10 CFR 830.120, *Quality Assurance*

29 CFR 1910.120(b), *Hazardous Waste Operations and Emergency Response: Interim Final Rule*, Department of Labor

40 CFR 260 - 268, Waste Management Requirements

40 CFR 355, Emergency Notifications

DOE Order 5400.5, *Radiation Protection of The Public and the Environment*

DOE Order 5700.67 C, *Quality Assurance*

Emergency Planning and Community Right-To-Know Act (EPCRA)

EPA Manual, "Test Methods for Evaluating Solid Waste" (SW-846)

EPA QAMS - 005/80

*Federal Facility Compliance Agreement - Agreement Between DOE, U. S. EPA, and Ohio EPA*

51 Federal Register 45654, December 19, 1986

FEMP Mixed Waste Chemical Treatment Project General CERCLA Work Plan, November 1995.

FERMCO *Quality Assurance Program* (RM-0012)

National Institute of Occupational Safety and Health Publication No. 84114, *Personal Protective Equipment for Hazardous Materials*

Nevada Test Site - *Defense Waste Acceptance Criteria, Certification, and Transfer Requirements* (NVO-325, Rev. 1)

Occupational Safety and Health Administration Regulations

Ohio Administrative Code (OAC) Chapters 3745-49 through 3745-69

Superfund Amendments and Reauthorization Act - 1986

---

U. S. EPA Best Demonstrated Available Technology/Resource Conservation and Recovery Act

U. S. EPA, *Quality Objectives for Remedial Response Activities Development Process*, OSWER Directive 9355.0-7B, March 1987

U. S. EPA Toxicity Characteristic Leaching Procedure (TCLP)