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DOE-0701-98**

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**Dear Mr. Saric and Mr. Schneider:**

**WASTE AT REMEDIAL ACTION PROJECT TRANSPORTATION AND DISPOSAL PLAN**

The purpose of this letter is to transmit the Transportation and Disposal Plan for the Waste Pit Remedial Action Project. The enforceable milestone submittal date for the document is April 30, 1998, as established in the approved Remedial Action Work Plan for Operable Unit 1 (OU1). As you are aware, current litigation precludes the Department of Energy (DOE) from awarding any contracts for commercial waste disposal. Therefore, this document primarily addresses how the OU1 materials will be handled, staged, and packaged at the Fernald Environmental Management Project (FEMP) for eventual rail transportation and disposal at an off-site disposal facility.

If you should have any questions, please contact Dave Lojek at (513) 648-3118.

Sincerely,

**Johnny W. Reising  
Fernald Remedial Action  
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**Enclosure: As Stated**

**1417**

Page 2

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000002

**TRANSPORTATION AND DISPOSAL PLAN  
FOR OPERABLE UNIT 1**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT  
FERNALD, OHIO**



**APRIL 1998**

**U.S. DEPARTMENT OF ENERGY  
FERNALD FIELD OFFICE**

**10400-PL-0004**

**REVISION 1**

**000003**

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LIST OF ACRONYMS

|                     |   |
|---------------------|---|
| AAR                 | Association of American Railroads                                     |
| AEDO                | Assistant Emergency Deputy Officer                                    |
| ARASA               | Alternative Remedial Action Subcontracting Approach                   |
| CDF                 | Commercial Disposal Facility  |
| CERCLA              | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR                 | Code of Federal Regulations   |
| CSXT                | CSX Transportation  |
| DOE                 | U.S. Department of Energy   |
| DOT                 | U.S. Department of Transportation                                     |
| dpm/cm <sup>2</sup> | disintegrations per minute/squared centimeters                        |
| EOC                 | Emergency Operations Center   |
| EPA                 | Environmental Protection Agency                                       |
| FAT&LC              | Fernald Atomic Trades and Labor Council                               |
| FDF                 | Fluor Daniel Fernald, Inc.  |
| FEMP                | Fernald Environmental Management Project                              |
| FRA                 | Federal Railroad Administration                                       |
| IAFF                | International Association of Fire Fighters                            |
| IT                  | International Technology Corporation                                  |
| LSA, n.o.s.         | Low Specific Activity, not otherwise specified                        |
| OU                  | Operable Unit   |
| RAWP                | Remedial Action Work Plan   |
| RCT                 | Radiological Control Technician                                       |
| ROD                 | Record of Decision  |
| RWP                 | radiation work permits  |
| SMAC                | System Mobility and Accountability Collection                         |
| SPR                 | Safety Performance Requirements                                       |
| TEP                 | Transportation Emergency Plan   |
| UMLER               | Universal Machine Language Equipment Register                         |
| UPRR                | Union Pacific Railroad  |
| USEPA               | United States Environmental Protection Agency                         |
| WAC                 | waste acceptance criteria   |
| WPRAP               | Waste Pits Remedial Action Project                                    |

## 1.0 INTRODUCTION

### 1.1 PURPOSE AND SCOPE

The purpose of this *Transportation and Disposal Plan* is to describe how rail transportation and disposal operations will be conducted to ensure safe and successful transportation of Operable Unit 1 (OU1) wastes from the Fernald Environmental Management Project (FEMP) to a commercial disposal facility (CDF).

This plan serves to: (1) describe the logistics of rail transportation associated with OU1 waste, (2) identify objectives and criteria for the operational phase of waste transport, (3) describe operational aspects of waste transportation sufficiently to demonstrate that wastes can be transported to the designated disposal site safely and in accordance with all applicable regulations, and (4) serve as a transition between design (i.e., the *Operable Unit 1 Remedial Design, Transportation and Disposal Plan*) and implementation of rail operations.

Submittal of this *Transportation and Disposal Plan* complies with the *Operable Unit 1 Remedial Action Work Plan* (RAWP, as amended) and meets the enforceable milestone for submittal of the *Operable Unit 1 Transportation and Disposal Plan* to the United States Environmental Protection Agency (U.S. EPA) by April 30, 1998.

### 1.2 PROJECT APPROACH

The selected remedy presented in the Operable Unit 1 Record of Decision (ROD) consists of the following activities:

- (1) Excavation of wastes from the pits (along with any residual contaminated soils from beneath the pits)
- (2) Preparation of the wastes (e.g., sorting, crushing, shredding)
- (3) Treatment by thermal drying (as necessary to remove water and achieve optimum moisture content) to meet the waste acceptance criteria (WAC) of the disposal facility
- (4) Blending to achieve a uniform product and loadout into railcars (or boxes, as applicable)
- (5) Transportation from the FEMP
- (6) Off-site disposal at a CDF or the U.S. Department of Energy's (DOE) Nevada Test Site, as necessary, depending on the radiological levels in the waste product.

All on-site waste excavation, treatment, and loadout activities (items 1 through 4) will be performed by the Alternative Remedial Action Subcontracting Approach (ARASA) subcontractor. The ARASA

subcontract was awarded to International Technology (IT) Corporation on October 20, 1997. Hereafter in the plan, reference to the ARASA subcontractor means IT. The Waste Pits Remedial Action Project (WPRAP) of Fluor Daniel Fernald (FDF), DOE's prime contractor at the FEMP, will be responsible for transportation and disposal of the waste (items 5 and 6). Actions required to successfully address these components will be accomplished by DOE, WPRAP, and IT.

### 1.3 DOCUMENT ORGANIZATION

The *Transportation and Disposal Plan* consists of nine sections. The following is a summary of the plan's contents:

- Section 2.0 Off-Site Rail: Issues applicable to off-site rail transport of FEMP Low Specific Activity waste for disposal at a commercial disposal facility
- Section 3.0 On-Site Rail: Logistics of FEMP on-site rail operations, including railcar and locomotive movements, railcar storage, and unit train assembly
- Section 4.0 Inspection/Maintenance: Rail related maintenance and inspections
- Section 5.0 Health and Safety: provides basic information about safety performance requirements, radiological safety, and security
- Section 6.0 Emergency Response: Emergency response structure for off-site rail incidents and references to procedures for on-site occurrences
- Section 7.0 Training: Project training goals and objectives for all personnel including off-site emergency response training to municipalities along the rail route
- Section 8.0 Project Organization: Organizational structure and data management requirements of the project
- Section 9.0 Reference: In addition, source documents that form the basis for references cited during the preparation of the *Transportation and Disposal Plan*.

## 2.0 OFF-SITE RAIL TRANSPORTATION

### 2.1 INTRODUCTION

This section describes several entities that govern the off-site transport of OU1 waste. In developing this *Transportation and Disposal Plan*, FEMP Rail Operations focused its planning not only on agency requirements such as the U.S. Department of Transportation (DOT), railroad, and the DOE, but also addressed stakeholder concerns as well. The fundamental requirements for each of the entities are briefly discussed in this section.

### 2.2 ROUTE

The primary rail route identified by the railroad is discussed below. It will be utilized for both outbound and returning unit trains. Unit trains will be assembled and stored on-site as defined in Section 3.0 of this plan. The route starts at the Shandon Yard and proceeds northwest on a CSXT branch line to Cottage Grove, Indiana. Unit trains will not be stored at Shandon Yard. The branch line is approximately 24 miles long and the unit train will travel at the designated speed of (not greater than) 25 miles per hour. At Cottage Grove, the locomotive will be uncoupled and perform a run around to pull the unit train onto the CSXT Chicago-Cincinnati mainline. The unit train will then travel southeast to the Queensgate Yard, Cincinnati, Ohio. From Cincinnati, the unit train will travel to the commercial disposal facility.

### 2.3 TRACK CONDITIONS

The Federal Railroad Administration (FRA) is the federal agency with jurisdiction over the condition of rail lines and associated matters. It is the responsibility of the railroad to ensure compliance with FRA regulations and to ensure that tracks and related structures, such as trestles, used by its trains are in good repair. It is also the responsibility of the railroad to maintain safe and sufficient road crossings, grades, and gates; to inspect the tracks; and to comply with applicable federal and state regulations. Controlling vegetation and other obstructions on or around the tracks are also the responsibility of the managing railroad.

#### 2.3.1 Track Classification

The branch line between the FEMP and Cottage Grove Yard is a Class 2 track, as defined by 49 Code of Federal Regulations (CFR) 213.9, which establishes a maximum allowable 25 miles per hour speed limit.

### 2.3.2 Track Upgrades

Due to the increased rail activity of the FEMP to Cottage Grove branch line, certain improvements were required. Upgrades to tracks in the local area were structural upgrades required to accommodate this increased activity and maintain safety. Specifically, upgrades to strengthen the Okeana Trestle, South Wynn Road Trestle, and Camp Run Trestle have been performed to accommodate unit train travel over these structures. Upgrades are underway for the Shandon Yard to enhance safe and efficient movement of unit train passage through the yard area. Figure 2-1 is a photograph of the Okeana Trestle as it appeared before the upgrade. Figure 2-2 is a photograph of the trestle depicting its current condition.

## 2.4 RISK AND SAFETY REQUIREMENTS

A transportation risk assessment comparing the risks of OU1 remedial alternatives is provided in Appendix D of the OU1 Feasibility Study. Direct radiation and the transportation risk impacts associated with transporting the waste were assessed. The results concluded that the estimated risks are well below the range considered to be acceptable by the U.S. EPA. The assessment also evaluated potential risks associated with accident-free waste transportation and the risks associated with an accident scenario. As documented in the feasibility study, the calculated excess cancer risk to members of the general public for the accident scenario is also within the range considered to be acceptable by U.S. EPA. Further detail on emergency response is provided in Section 6.0 of this plan.

## 2.5 RAIL SHIPPING REQUIREMENTS

Rail shipping requirements encompass three major areas: (1) DOT requirements, (2) railroad requirements, and (3) DOE requirements.

### 2.5.1 DOT Requirements

DOT requirements are divided into three major areas. These areas are: waste characterization, packaging, and shipping documentation.

Waste characterization is the determination that the waste being shipped meets the WAC of the disposal facility. From this determination, proper packaging requirements and shipping name are applied to the waste. The proper shipping name for OU1 waste will be Radioactive Material, LSA-I, n.o.s., UN2912.



FIGURE 2-1

000012

6600-101



FIGURE 2-2

000013

6349-1215

Packaging of this type of waste requires a strong, tight package for shipment (49 CFR 173.427). By definition, a strong, tight package prevents leakage of radioactive contents under normal transportation conditions. The FEMP gondola railcars will be designed to meet this requirement and will have an additional liner permanently applied to further reduce the chance of leakage. The railcars will be stenciled on both sides as follows: "FOR RADIOACTIVE USE ONLY".

Information to be included on the shipping documentation is identified in 49 CFR 172.200-202 and 172.203(d) and (g). The shipping documentation will be completed in accordance with a yet to be developed procedure for assembling the unit train paperwork package for off-site shipments. This procedure will be developed.

#### 2.5.2 Railroad Requirements

For the purposes of this project, railroad requirements for shipping cover the following areas: design of railcars, unit trains, documentation, inspections, and bad order cars.

The FEMP gondola cars will be designed in accordance with the Association of American Railroads (AAR), FRA, and other federal regulations effective at the time of contract award. The car manufacturer will provide documentation demonstrating that the car design is in compliance with current AAR standards and recommended practices. These gondola cars will be stenciled in accordance with *AAR Manual of Standards and Recommended Practices*, latest revision. The owner's reporting marks and numbers will be painted on the gondola body and steel stenciled on the center sill. The DOE-FEMP owned gondola car reporting numbers will be sequential eight-digit alphanumeric beginning with FFOX0001 through FFOX0135, based on current estimates of the number of gondolas required. The DOE-FEMP reporting marks (FFOX) will be registered with the AAR Universal Machine Language Equipment Register (UMLER). The UMLER file is the official source of acceptable railcars for interchange service and will provide specific details about each car, such as dimensions and maintenance records.

FEMP railcars will be shipped in unit train configuration. A unit train runs directly from the point of origin to its destination, without adding or deleting cars en route, and carries a single commodity. The FEMP unit train is expected to consist of approximately 40-60 cars, including two buffer cars, one each at the front and rear of the train.

Initial rail-related documentation begins with a bill of lading for each shipment. The bill of lading provides general information needed by the railroads including: proper shipping name, shipment type, billing code, train weight, capacity utilized, exclusive use instructions, emergency communications information, and return/delivery notes. A consist, which is a listing of railcars by car number in the order the cars are placed in the train, is also provided.

The railroad will also require pre-departure and en route inspections in accordance with 49 CFR 215.13. These inspections will eliminate "bad order cars", or cars deemed not in a condition to be transported. If a bad order car is identified prior to departing from the FEMP, it will be removed from the unit train and returned to site, and all paperwork will be adjusted accordingly.

Any bad order car identified en route will be the responsibility of the railroad company in possession of the car at the time it is discovered. If the car can be moved, maintenance will be performed in a repair shop accepted by the railroad, per 49 CFR 215.9. If the car cannot be safely moved to a repair facility, a mobile repair crew will be dispatched to the car location. The railroad company will notify the FEMP of any bad order cars identified en route and consult on repairs made to the cars.

There are two general categories of bad order cars. The first is a leaking car. If a leaking car is discovered, the extent of the condition will be assessed to determine if the leaking bad order car can be removed from the train or if the train must be held until the damaged car is repaired. DOE will take an active role in any loss-of-containment repairs. The second is a mechanical defect. This category consists of overheated (failed) roller bearings, missing or broken safety devices, etc. The railroad will make these repairs (without jeopardizing the contents of the railcars) and will place the car back into service.

### 2.5.3 DOE Requirements

The primary DOE requirements are contained in DOE Orders 460.1A, *Packaging and Transportation Safety*, and 460.2, *Departmental Materials Transportation and Packaging Management*, which cover DOT requirements that regulate the operations and activities associated with the transportation and packaging of hazardous materials in interstate and intrastate commerce.

Prior to the first shipment, FEMP Rail Operations will contact state emergency response organizations along the rail route. Until the shipment is received and disposed of at a CDF, DOE-FEMP retains

ownership of the waste and takes responsibility for providing technical support and oversight in the event of an incident to ensure the material is safely handled. FEMP Rail Operations will track each unit train from the time it departs until it (i.e. empty railcars) returns to the FEMP by utilizing communications software packages designed by the railroad companies and provided free of charge to its customers.

The railroad will assign a unit train number for each shipment that will be the reference number for each shipment paperwork package. The same information provided on the DOE/Nuclear Regulatory Commission Form 741, Nuclear Material Transaction Report, is entered in a DOE system mobility and accountability collection (SMAC) database. The SMAC system is a centralized collection point for transportation information from around the DOE complex. The following information must be available to DOE to prepare the shipment paperwork package:

- Radiological assay for the waste
- Gondola car paperwork, car number, volume, weight, and date filled
- Radiological survey for each full gondola car including surface and three meter readings
- Bill of lading, with continuation sheets
- CDF Radioactive Waste Shipment and Disposal Record
- Nuclear Materials Shipping Order (form FS-F-558) .

Each waste shipment paperwork package will be maintained on file at the FEMP for the duration of the project.

### 3.0 ON-SITE RAIL OPERATIONS

#### 3.1 INTRODUCTION

This section provides a general description of the on-site facilities that will be utilized for the successful completion of this project. It focuses on on-site rail related activities including railcar movements and unit train assembly, departure, return, and receipt.

#### 3.2 FACILITIES

The following facilities either have been or will be installed to accomplish the on-site rail operations portion of the WPRAP Project. Figure 3-1, FEMP Rail Operations Area, shows the location of each facility and provides a view of the entire on-site rail infrastructure.

##### 3.2.1 Location #1: North Rail Yard

The North Rail Yard consists of 11 individual tracks plus switches and crossovers and has the capacity to store 165 railcars. Both loaded and empty railcars will be stored in this area, which is located in the northeast area of the site.

##### 3.2.2 Location #2: Railcar Loadout and Scale Facility

The loadout facility will be designed, constructed, and maintained by IT. The facility will accommodate four railcars at a time and will also contain the rail scale. At this facility the railcar covers will be removed, liners installed, cars loaded, liners sealed, and railcar covers replaced. The cars will then be radiologically surveyed (and decontaminated if necessary), prior to being delivered to FEMP Rail Operations for storage in the North Rail Yard awaiting unit train staging and shipment.

##### 3.2.3 Location #3: Railcar Maintenance/Inspection Pit

A Railcar Maintenance/Inspection Pit located at the south end of Track 12 will be utilized as needed for railcar inspection and maintenance.

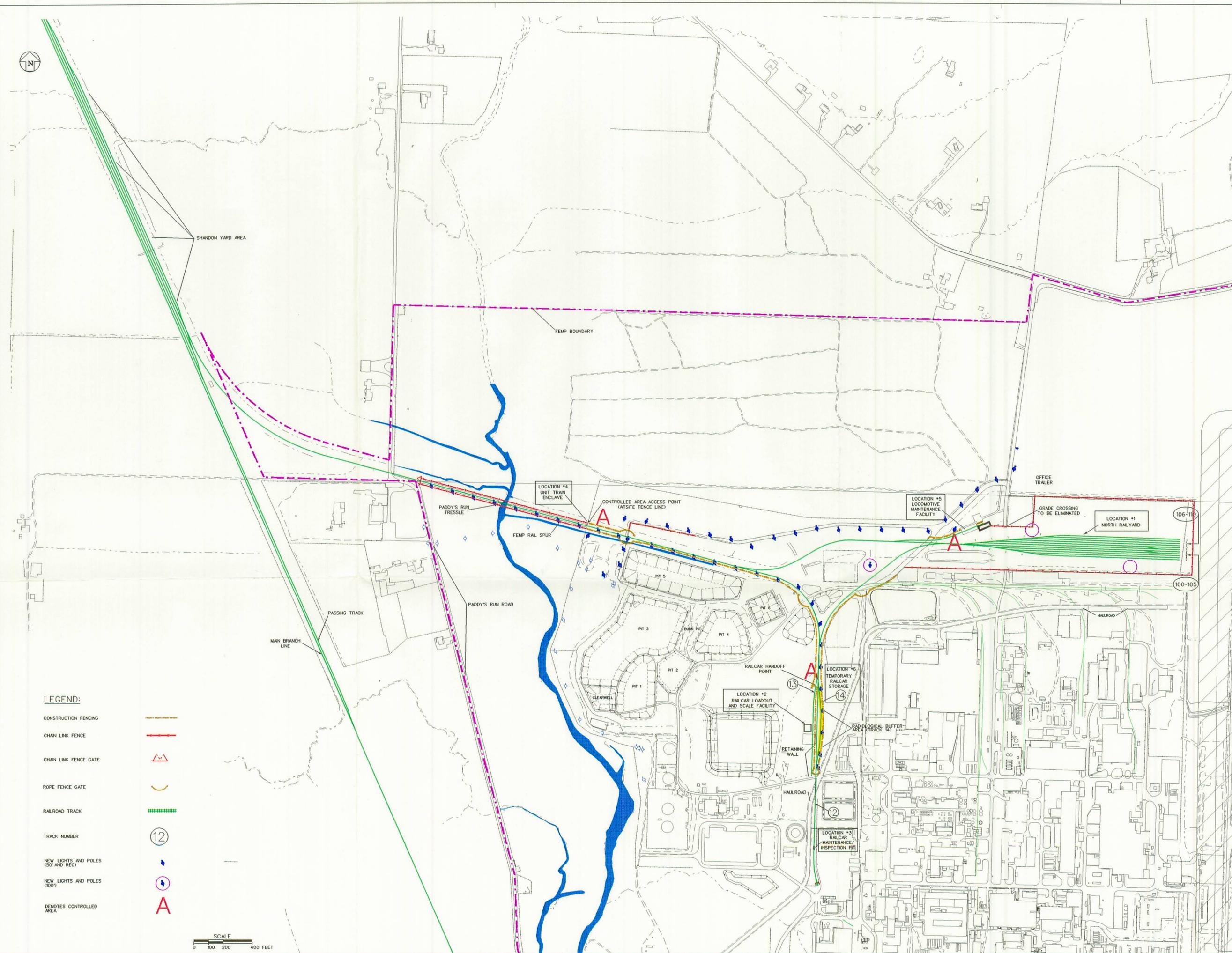
##### 3.2.4 Location #4: Unit Train Enclave

The enclave is comprised of a 7 feet high chain link fence installed along the track, approximately 15 feet from the centerline of the track in both directions. This enclave starts approximately 180 feet east of Paddys Run Road and extends to the site's west perimeter fence. There are gates at both ends of the enclave to control access to the unit train while it is staged in this area.

# FEMP RAIL OPERATIONS AREA

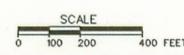
FIGURE 3-1

1417



**LEGEND:**

- CONSTRUCTION FENCING
- CHAIN LINK FENCE
- CHAIN LINK FENCE GATE
- ROPE FENCE GATE
- RAILROAD TRACK
- TRACK NUMBER 12
- NEW LIGHTS AND POLES (50' AND REG)
- NEW LIGHTS AND POLES (100')
- DENOTES CONTROLLED AREA A



000018  
246072-1

### 3.2.5 Location #5: Locomotive Maintenance Facility

A locomotive maintenance facility is under construction for this project. Facility dimensions will be 40 feet wide by 110 feet long. There will be one track entering this facility, which will pass through the northeast end of the building and continue approximately 50 feet. An inspection pit measuring 50 feet by 5 feet by 4 feet will be located in the northeast end of the facility. This facility will be equipped with electricity, heat, potable water, a fire alarm system, and a louvered fan for ventilation.

### 3.2.6 Location #6: Temporary Railcar Storage Area

Tracks 13 and 14 may be used to temporarily store railcars while daily activities such as railcar delivery and pick up, loading and decontamination are being performed.

## 3.3 RAILCAR MOVEMENTS

### 3.3.1 Daily Movements

At the start of the shift, the FEMP Rail Operations supervisor will conduct a daily safety meeting and brief the train crew on the rail activities to be performed. A clear understanding of the daily activities will be communicated prior to initiating operations. All rail activities will only be performed by trained FEMP personnel in accordance with yet to be developed procedures.

Before accepting loaded railcars from IT, the exterior of each railcar will be surveyed by Radiological Control for compliance with DOT regulations. Train crew personnel will use the locomotive to pick up the loaded railcars, along with documentation indicating compliance with the WAC, and place the railcars in the North Rail Yard. The train crew will then pick up empty cars from the North Rail Yard and deliver them to the loadout facility.

### 3.3.2 Unit Train Assembly/Departure

To minimize shipment delays, the FEMP will perform a preliminary inspection of every railcar before loading and while assembling the unit train. The inspection will be conducted to verify physical integrity, and to ensure that the car is properly placarded so that no conditions exist which may contribute to or cause a delay while en route to the destination (for example, discovery of a bad order car).

Unit trains are planned to be assembled approximately every other week and will be scheduled for departure with a 7 day notice provided to CSXT. The FEMP train crew will pick up loaded railcars from the North Rail Yard and move them to the unit train enclave where they will await CSXT arrival.

The FEMP locomotive will have the capability of moving 6-10 loaded railcars at a time. The unit train will be staged in the enclave for a period of less than 48-hours.

A pre departure inspection (lasting approximately one hour) will be performed by CSXT to ensure that no condition exists which may cause an accident while en route. At the FEMP unit train enclave, the CSXT crew will couple to the FEMP train and inspect cars that are staged outside the FEMP radiological controlled area. Once these cars are accepted, the CSXT locomotive will pull the entire train out to a point where the last car clears Paddys Run Road. At this point, the train will be stopped and the remaining cars will be inspected, the End of Train device will be emplaced, and a terminal brake test will be performed. After successful inspection, CSXT will accept the train, and the responsibility for safe transport. During this activity, any bad order cars identified will be separated and moved back on site and the paperwork will be adjusted accordingly.

### 3.3.3 Unit Train Return/Receipt

The CDF will decontaminate the railcars to DOT limits and send a facsimile of their radiological surveys for each train to the FEMP prior to the return of the FEMP unit train. A 24-hour advance notice of the train's arrival at the FEMP will be obtained on the basis of car tracking information and/or receipt of notice from CSXT. FEMP Rail Operations will then notify the appropriate personnel as to the unit train's estimated time of arrival at the FEMP.

After the FEMP receives sufficient notice from CSXT of the train's imminent arrival, the unit train will be met by FEMP personnel at Shandon Yard. The unit train will be inspected for physical damage, and to verify that only DOE/FEMP owned cars are received. Major damage will be investigated to determine the circumstances associated with the damage. The accepted cars will be pushed onto the main FEMP spur and into the site by CSXT's locomotive, to the controlled area (unit train enclave) where the cars will be uncoupled and CSXT's locomotive will depart.

FEMP personnel will then conduct a radiological survey to verify that the cars are uncontaminated. Uncontaminated cars will be moved to the North Rail Yard. If a car is contaminated, segregation and decontamination of that car will be initiated by moving the car to the ARASA decontamination area. Any contamination or physical damage found will be documented and corrected, and notifications will be made accordingly.

### 3.4 INTEGRATION WITH ON-SITE GROUPS

FEMP Rail Operations and IT will interface daily to ensure safe and efficient operations. IT will notify the FEMP Rail Operations supervisor of the railcar requirements for each operating shift, provide the required documentation for the acceptance of loaded railcars, and address any other routine activities as needed.

On the day of unit train assembly, FEMP Rail Operations will coordinate with other on-site groups such as Radiological Control, Health & Safety, Quality Assurance, and Security to ensure that the train is assembled in time for the scheduled CSXT pickup.

### 3.5 TRACK ACCESS CONTROL

All areas where railcars will be loaded and placed on-site pending assembly of a unit train will be provided with an appropriate level of security and lighting. Personnel access will be restricted to trained personnel for safety and security reasons.

### 3.6 RUNOFF/DRAINAGE CONTROL

DOE is committed to ensuring that no material is released from railcars during transportation. To achieve this, the FEMP railcars will be prepared in a manner which meets the DOT requirements for shipping low level radioactive waste. The FEMP railcars will be designed to include a permanent, impermeable polyurethane liner which will ensure the tightness of the gondola car against leaks. This polyurethane liner will be applied to the inside surface of the gondolas. Each gondola car will also have a rigid cover that will remain in place except for loading and unloading. In addition to the permanent railcar liner, a disposable liner will be installed prior to loading each car. This liner will aid in removing waste from the car at the disposal facility by minimizing hold-up material and contamination.

Potential releases of material are further reduced by minimizing the travel time between the FEMP and the disposal facility. The FEMP will ship waste in unit trains that receive priority switching and right-of-way which expedites the trains travel time. The FEMP anticipates the trip to the disposal facility will require less time for unit train service compared to regular train service. DOE has committed to place cars in the unit train enclave no longer than necessary prior to the unit train departure. DOE anticipates this time to be approximately 48-hours. Likewise, it is the intention that empty railcars returned to the FEMP from a CDF will be moved from the Shandon Yard into the FEMP- controlled area within approximately two hours of arrival.

## 4.0 INSPECTIONS/MAINTENANCE

### 4.1 INTRODUCTION

This section provides a general overview of the anticipated rail-related maintenance activities and associated inspections for this project. Equipment service intervals and maintenance activities are based upon the manufacturer's recommendations and industry standards. All project site rail components which are integral to this project will be tested and evaluated. Any deficiencies noted will be corrected prior to project startup. On-site maintenance activities related to this plan will receive radiological support as necessary.

### 4.2 MAINTENANCE PERSONNEL

#### 4.2.1 Train Crew

The FEMP train crew will consist of members of the Fernald Atomic Trades & Labor Council (FAT&LC) work force who will perform daily pre-operational inspections and subsequent daily servicing activities for locomotive startup, inspection, and operation. Members of the FEMP train crew will also participate in on-site track and switch inspections and will work under the direction of the FEMP Rail Operations supervisor.

#### 4.2.2 Maintenance Crew

FAT&LC maintenance personnel will be trained to perform maintenance, such as replacing brake shoes and changing oil, on the locomotives as needed. These activities will comply with manufacturer-recommended service intervals and will be performed under the direction of the FEMP Rail Operations supervisor.

### 4.3 ON-SITE EQUIPMENT MAINTENANCE

A complete and adequate maintenance program will be implemented to keep the on-site equipment in good mechanical condition. It will include all the periodic and progressive maintenance necessary to obtain maximum trouble-free service. This will enable maintenance operations to be performed when they are needed and in the proper sequence. Current FEMP maintenance procedures will be followed, where applicable, in the performance of these activities.

#### 4.3.1 Locomotives

Utilizing the Defense Reutilization Marketing Service, DOE located two Baldwin-Lima Hamilton 60-Ton locomotives. Figure 4-1 is a photograph of one of the locomotives. These units were procured through the Government Excess Surplus Program. The locomotives were completely remanufactured in 1990 and 1991 and are considered to be in excellent condition. The locomotives will be alternated each day to ensure ample time to complete daily pre-operational inspections and routine daily service, such as checking engine lubrication, battery readings, fuel, and sand.

Routine service of the locomotives is based upon operating hours and fuel consumption. Routine service includes activities such as inspecting traction motors, coupler alignment, wheel condition, air brakes, and mechanical parts.

Train crew and maintenance personnel will utilize and be trained to the manufacturer's Locomotive Operation and Maintenance Manual. The manual contains a troubleshooting chart and other pertinent information which will aid in the performance of maintenance activities.

#### 4.3.2 Gondola Railcars

Present plans call for the DOE purchase of 135 gondola railcars. Considering the limited number of trips each car will make to and from a CDF, it is anticipated that minimal routine maintenance will be required to be performed at the FEMP, other than brake shoe and hose replacements. Railcars will be inspected primarily for physical damage and availability for service by FEMP train crew personnel.

#### 4.3.3 Trackage and Switches

The FEMP Rail Operations supervisor and a member of the train crew will perform regularly scheduled inspections of on-site trackage and switches as required. Rail Operations personnel will be instructed to recognize unsafe track conditions and to report such in a timely manner. Unsafe track conditions may include loose ties or damaged rails.

Periodically, subcontractor personnel will perform an independent on-site track inspection to verify that the tracks are safe and operational. They will document their inspection and provide a written report as to their findings and any possible recommendations and corrective actions.



FIGURE 4-1

#### 4.4 LUBRICANTS AND FLUIDS

All lubricants and fluids required for maintenance activities will be maintained at the FEMP locomotive maintenance facility. A satellite accumulation area will be established at the locomotive maintenance facility for all liquid wastes generated from maintenance activities. The wastes will be accumulated and managed in accordance with FEMP procedure EW-0004, *Satellite Accumulation Areas for Hazardous Waste*.

## 5.0 HEALTH AND SAFETY

### 5.1 INTRODUCTION

The focus of this section will be on the on-site rail operations related activities. The overall on-site project Health and Safety responsibility lies directly with the DOE and its contractors. The primary areas of concern addressed in this section are: Safety Performance Requirements (SPR), radiological safety, and security.

### 5.2 SAFETY PERFORMANCE REQUIREMENTS

The SPR Manual specifies the Occupational Safety and Health Program that applies to all activities at the FEMP. SPRs implement requirements established by federal, state, and local regulations (e.g., Occupational Safety and Health Administration, American Conference of Governmental Industrial Hygienists, and National Fire Code; DOE Orders; and Best Management Practices established by Fluor Daniel Fernald through experience, lessons learned, and employee input. SPRs identify safety and health standards for assessing and planning work at the FEMP. They contain specific information on what must be done to safely execute work and are not intended to specify how to execute work. DOE will implement the SPRs by incorporating their requirements into all procedures that will be developed to guide the performance of transportation and maintenance activities.

It is anticipated that specific SPRs may need to be developed as the details of the project unfold. For planning purposes, however, existing SPRs are being used as the basis for Health and Safety on this project.

### 5.3 SAFETY PRECAUTIONS

Due to the unique hazards associated with rail yard activities, such as coupling and uncoupling, re-railing, chocking, and movement of the railcars; FEMP Rail Operations will emphasize extreme caution and safety in procedures which will be developed for daily operations. DOE will continually stress the potential hazards associated with rail activities to all project personnel through daily briefings and work practices.

#### 5.4 RADIOLOGICAL SAFETY

Figure 3-1, illustrates the FEMP Rail Operations Area which is anticipated to contain five sub-areas subject to specific controls regarding the requirements and conditions of personnel access and activity. The Rail Operations Area will be delineated by fencing with gates available at designated crossing points and posted as a radiologically controlled area. The DOE defines a "controlled area" as any area to which access is managed in order to protect individuals from exposure to radiation and/or radioactive materials. Individuals who enter only the controlled area without entering radiological areas are not expected to receive a total effective dose equivalent of more than 100 millirem in a year. FEMP radiological control technicians (RCT) will conduct frequent radiological surveys to track the effectiveness of implemented radiological controls.

Locomotive and railcar maintenance activities may take place anywhere within the Rail Operations Area based on the location of the equipment at the time of malfunction. For these maintenance activities, the area subject to maintenance/physical contact will be surveyed for loose alpha contamination to a level of 20 disintegrations per minute per 100 square centimeters (20dpm/100cm<sup>2</sup>).

If the equipment in this area exceeds this activity level, a smaller contamination area will be established at the site of work. A "contamination area" is defined by the DOE as any area where contamination levels are greater than 20 dpm/100cm<sup>2</sup> for removable contamination, and 500 dpm/100cm<sup>2</sup> for total (fixed and removable) contamination, but less than or equal to 100 times those values. This type of work will be performed under a radiological work permit (RWP) with the FEMP train crew wearing anti-contamination clothing and receiving continuous coverage (observation and radiological monitoring) from an RCT for the duration of the work activity. An RWP is a document that identifies radiological conditions, establishes worker protection and monitoring requirements, and contains specific approvals for radiological work activities. The RWP serves as an administrative process for planning and controlling radiological work and informing the worker of the radiological conditions. Alternatively, if decontamination is feasible, decontaminating the work surface to a level of below 20 dpm/100cm<sup>2</sup> loose alpha contamination will eliminate the need for the RWP, the continuous RCT monitoring, and the anti-contamination clothing.

If/when contamination areas are established, the RCT will survey the workers out of the area, and immediately following the completion of work, survey the work area for the purpose of down-posting.

Railcar coupling/uncoupling activities may occur anywhere in the Rail Operations Area as well. For coupling/uncoupling activities, work will be performed in disposable anti-contamination gloves worn over the standard work glove. All work will be performed under continuous RCT coverage (observation and radiological monitoring) and the RCT will collect the anti-contamination gloves in a radiological waste bag after use. Survey of the work gloves for re-use will be attempted in an effort to minimize waste. The RCT will also survey the workers' hands after removal of gloves.

The required level of protection for activities such as coupling/uncoupling will be evaluated as an on-going activity throughout the project. Protection from contamination will be such that anti-contamination clothing or some other barrier will be placed between the surface of the equipment and the bodies of the workers performing the activities.

FEMP Radiological Control will periodically perform surveys of the rail lines in the Rail Operations Area to provide contamination control data and to justify the mode of operation.

#### 5.5 ACCESS OF RAIL OPERATIONS PERSONNEL

Only necessary personnel with the appropriate training will be given access to the radiologically controlled areas of the Rail Operations Area. The FEMP train crew will ingress/egress the Rail Operations Area through a radiological control point located at the southern boundary of the controlled area and will be subject to personal contamination monitoring upon exit. All incidents of personal contamination will be addressed per existing, approved site procedures.

Administrative support and oversight personnel may ingress/egress through a radiological control point from an uncontrolled area located in the northeast section of the rail yard. Monitoring equipment will be provided at this location to accommodate ingress/egress of this area.

### 5.6 NON-FEMP PERSONNEL/VENDORS

Appropriate railroad personnel and vendors will be given entrance only on an escorted basis, and only to the extent necessary to perform their intended function (e.g., CSXT pickup or delivery, locomotive fuel delivery for locomotives, subcontracted services on railcars and locomotives).

### 5.7 ARASA SUBCONTRACTOR/FEMP RAIL OPERATIONS BOUNDARY

The boundary between the FEMP Rail Operations Area and the IT work area will be fenced by IT with access to the rail lines controlled. This boundary line will be located somewhere on track 13 (the loadout facility track). This will prevent contamination from being tracked from the high contamination area in the loadout facility to the FEMP Rail Operations Area. A "high contamination area" is defined by the DOE as any area where contamination levels are greater than 100 times the values specified in section 5.4 for a contamination area. It is anticipated that the IT work area will be posted as a high contamination area.

Before accepting loaded railcars from IT, the exterior of each railcar will be surveyed by FEMP Radiological Control for compliance with DOT regulations. Exterior non-fixed contamination levels will be determined per 49 CFR 173.443, *Contamination Control*. Once the railcars have been surveyed and are ready for release, IT will notify FEMP Rail Operations and provide the necessary documentation.

### 5.8 SECURITY

All areas where railcars will be loaded and stored in the Rail Operations Area pending the completion of a unit train will be fenced and provided with the appropriate levels of security and lighting. FEMP security will monitor site access by utilizing stationary posts, conducting walking, driving, and perimeter patrols on a 24-hour basis.

The North Rail Yard and unit train enclave will be fenced in by a 7 foot high perimeter fence and will be lighted. Also, surveillance cameras will be placed in the Rail Operations Area and monitored by FEMP security as part of their routine patrol and by the FEMP Communications Center on a 24-hour basis.

## 6.0 EMERGENCY RESPONSE

### 6.1 INTRODUCTION

The purpose of this section is to document the emergency response procedures that are in place to respond to transportation accidents involving shipments of OU1 waste. The scope of this discussion focuses on off-site occurrences and references procedures for on-site occurrences.

DOE Order 151.1, *Comprehensive Emergency Management*, provides for a DOE Emergency Management System (EMS). Pursuant to this order, DOE must maintain a transportation emergency preparedness program that enhances and integrates transportation emergency preparedness capabilities within the EMS. The Transportation Emergency Preparedness Program has been established at DOE headquarters. The FEMP has a similar program. The Transportation Emergency Preparedness Program ensures that an adequate DOE response to transportation incidents involving DOE materials is performed and that DOE's responsibilities under the National Contingency Plan and the Federal Radiological Emergency Response Plan are adequate. The Transportation Emergency Preparedness Program also provides technical advice and assistance as required for transportation incidents involving radioactive wastes.

### 6.2 FEMP EMERGENCY RESPONSE PREPAREDNESS PLANS

The *FEMP Transportation Emergency Plan (TEP)*, PL-3043, is part of the DOE-FEMP Transportation Emergency Preparedness Program. The FEMP TEP provides a centralized program approach to all off-site transportation emergency response including products, samples, waste, and FEMP rail shipments. The unique aspects of FEMP rail operations have been incorporated into the FEMP TEP to ensure that it addresses rail transportation.

The FEMP TEP describes the overall DOE/FEMP process developed for the coordination of response efforts to off-site transportation incidents. This assistance planning is accomplished by adherence to all applicable federal, state, and local rail transportation related emergency response requirements, plus utilizing existing DOE programs designed to protect the well being of citizens and the environment from accidental releases of transported materials.

Procedures for on-site emergencies are addressed in the *FEMP Emergency Plan*. The *FEMP Emergency Plan* details the procedures to be followed at the FEMP in the event of an accident or emergency,

highlights FEMP safety features, and governs the spill response actions. The *FEMP Emergency Plan* is distributed to participating mutual aid organizations, such as local fire departments and hospitals, in the general vicinity of the FEMP. Additionally, the *FEMP Spill Prevention Control and Countermeasure Plan* will be implemented accordingly for incidents on or in close proximity to the FEMP.

### 6.3 EMERGENCY RESPONSE FOR THE FEMP RAIL OPERATIONS

#### 6.3.1 FEMP Off-Site Emergency Response Support

An OUI shipment becomes an off-site shipment at the point when the last railcar crosses the facility boundary. When the shipment is off site, the rail carrier becomes responsible for providing emergency response support to the local authorities in proximity of any incident. The rail carrier also has contractors available for containment and cleanup as necessary. DOE will advise and provide support as requested by the local response authority (49 CFR 174.750). Local response personnel including police, firefighters, and emergency responders, typically are the first to arrive on the scene of an incident. They must be provided with as much information about the nature of the material involved as possible. Shipping papers provide the technical information needed by first responders to accurately identify the hazards involved in the incident. Information contained in the shipping papers includes source terms, health and safety concerns, and recommended protective actions. This information is consistent with the DOT, Research and Special Programs Administration publication, *North American Emergency Response Guidebook*, Guide 162.

The following is an overview of the emergency response responsibilities of the train crews, railroad companies, DOE, individual states and Fernald to support local authorities at an accident scene.

1. Railroad Train Crew
  - Trained in accordance with DOT *Emergency Response Guidebook*
  - Stabilize situation
  - Provide notification of incident to railroad company
2. Railroad Company Emergency Response Organization
  - Make appropriate additional notifications (local authorities, DOE, etc.)
  - Dispatch Emergency Response Personnel to the scene to support On-Scene Commander
  - Mobilize strategically positioned emergency response subcontractors if necessary
3. Local Authorities

- Typically functions as the On-Scene Commander
4. State Emergency Response Organizations
    - Each state possesses an Emergency Response Organization capable of responding to radiological emergencies
  5. DOE Regional Radiological Assistance Teams
    - Eight Radiological Assistance Teams across the United States
    - Provide On-Scene Commanders with support in terms of radiological monitoring, communications and information coordination during an emergency
    - Consist of DOE and contracted personnel possessing expertise in health physics, public information and communications
  6. Fernald Emergency Operations Center
    - Staff Fernald Communication Center 24-hours per day
    - Activate Fernald Emergency Operations Center if warranted
    - Provide technical and communications personnel to accident scene as required to mitigate accident conditions and support cleanup efforts.

The FEMP TEP is activated when the railroad or the local response organization contacts the FEMP to notify DOE that an incident has occurred. The 24-hour emergency phone number provided on the bill of lading, as required by 49 CFR 172.604, is a direct telephone line to the FEMP Communications Center.

The FEMP Communications Center provides communication capability for the FEMP, monitors conditions, provides technical guidance, and makes notifications as required. The FEMP Communications Center establishes and maintains direct communication with the on scene Incident Commander and the FEMP Assistant Emergency Duty Officer (AEDO) until the Emergency Operations Center (EOC) is activated.

The FEMP EOC is activated at the direction of the AEDO for all events categorized at the emergency level, including transportation events. The EOC officially becomes operational when the Emergency Director or Deputy Emergency Director arrives on scene. The combined efforts of all EOC staff members provide support, guidance, and direction to the Incident Commander in the field. The EOC staff assumes responsibilities such as making protective action recommendations, providing notifications, and obtaining necessary resources as required by the specific circumstances of the event.

### 6.3.2 CSXT Track Segment

CSXT maintains a *Hazardous Materials Emergency Response Guide*, which outlines the procedures employees must take in the event of an incident. The plan includes notification responsibilities, emergency response procedures for personnel first on the scene, procedures for handling leaking cars in rail yards, environmental considerations, and additional precautions to take in the event of an incident. DOE, as shipper, will be notified by CSXT immediately should an incident occur. Both CSXT and DOE will initiate emergency procedures simultaneously upon notification.

The primary off-site proposed rail route starts at the Shandon Yard and proceeds northwest to Cottage Grove, Indiana. At Cottage Grove, the train enters the CSXT Chicago-Cincinnati mainline and travels southeast to the Queensgate Yard, Cincinnati, Ohio before proceeding to the CDF. CSXT is responsible for response and remediation of any rail transportation incidents along this route. The FEMP EOC will be prepared to provide CSXT with technical support if requested. If assistance is required beyond technical support, DOE maintains eight regional coordinating offices for radiological assistance for transportation incidents involving radioactive materials. Each DOE regional office can provide assistance and radiological advice or personnel and equipment, if requested to protect public health and ensure safety.

### 6.4 COMMUNITY RELATIONS

In 1995, the International Association of Fire Fighters (IAFF) contracted with the FEMP for assessment of emergency response capabilities both at DOE locations as well as in communities lying along transportation routes, should a mishap occur involving shipments of contaminated wastes. After assessing emergency response capabilities along both truck and rail routes, the IAFF developed special training programs and guidance materials directed towards radioactive materials emergency response. IAFF offered and is currently conducting direct training and "train the trainer" training programs at specific sites and locales along the DOE transportation routes. Additional training along the rail routes will be provided if necessary. Section 7.0 of this document provides a general description of the IAFF training program.

## 7.0 TRAINING

### 7.1 INTRODUCTION

This section will discuss the WPRAP training and qualification program and identify requirements for personnel assigned to the WPRAP Operations Project. These requirements will be established in accordance with Chapters I and IV of DOE Order 5480.20A and 49 CFR 172.700. The training and qualification program will also establish criteria for operator qualifications and incorporate requirements described in RM-0002, *Training Department Program Manual*. In addition, this section will also address off-site emergency response training provided by the IAFF, in conjunction with DOE.

### 7.2 GOALS AND OBJECTIVES

The goals for the training and qualification program include: (1) clearly identifying objective, written performance standards for personnel assigned to the project; (2) prescribing measures which ensure management, technical support staff, and FEMP train crew personnel are knowledgeable of project purpose and objectives; and (3) establishing on-the-job training criteria to ensure train crew personnel remain adept at performing rail-related activities.

### 7.3 PROGRAM REQUIREMENTS

The training and qualification program will apply to all FEMP rail operations personnel. Any revisions to the training and qualification program must be approved by the WPRAP Operations Manager.

WPRAP project personnel qualifications established in the program will be effective for a maximum of two years. Requalification will be accomplished by either repeating the WPRAP training and qualification program requirements, or by completing an approved refresher course.

All training activities will be documented on the appropriate forms. All training documentation and training records will be maintained in the FEMP Training Records Management System.

### 7.4 TRAINING REQUIREMENTS

#### 7.4.1 On-Site Training Requirements

All personnel performing work at the FEMP are required to participate in periodic training. FEMP training is performance based; each employee will demonstrate a satisfactory level of training comprehension for each course attended. All project personnel will complete the minimum FEMP site access requirements.

#### 7.4.2 Operations Training

An operable scale model of the entire FEMP rail infrastructure will be utilized to simulate rail activities and provide basic instruction to all project personnel. This model will also be used in the development of procedures and other project documents.

WPRAP has identified four major areas of training; these are: (1) rail; (2) locomotive; (3) railcars; and (4) operations. FEMP train crew personnel will be trained to all four categories and will be required to complete on-the-job training prior to performing rail activities.

##### 7.4.2.1 Rail Related Training Subjects

Rail related training subjects will include, but not be limited to, the following.

- Track inspections
- Switch inspections
- Switch maintenance

##### 7.4.2.2 Locomotive Related Training Subjects

Locomotive related training subjects will include, but not be limited to, the following.

- Pre-start checklist
- Operation
- Locomotive service
- Preventative maintenance

##### 7.4.2.3 Railcar Related Training Subjects

Railcar related training subjects will include, but not be limited to, the following.

- Railcar inspection and maintenance
- Re-railing
- Railcar chocking and securement
- Hand brake usage

##### 7.4.2.4 Operation Training Subjects

Operation related training subjects will include, but not be limited to, the following.

- Railcar movements
- Rail switch control
- Hand brake usage

All of these training subjects will be proceduralized prior to operations start up.

### 7.4.3 Off-Site Emergency Response Training

A survey was conducted by the IAFF to ascertain the current status of emergency response in townships, municipalities, and cities in proximity to primary DOE transportation routes. The survey sought to identify fire departments or other emergency response groups along these routes, their size and makeup, jurisdictional and planning roles in emergency response, extent of training in hazardous materials response, and equipment and resources.

In addition to emergency response procedures required by law, DOE has developed special training programs and guidance material, and is offering direct training in emergency response to locales that require it based on the results of the survey. This training, a cooperative effort between DOE and the Hazardous Materials Departments of the IAFF, will provide refresher operations training, as well as in-depth training in radiation, to fire fighters along the transportation routes who are currently trained to the *National Fire Protection Association Standard for Professional Competence of Responders to Hazardous Materials*, 472. These fire fighters are very probably the first responders in any off-site accident. This additional training will help provide to the fire fighters the skills they need to protect their health and safety when responding to hazardous material emergencies, and specifically to accidents involving radioactive materials.

Respective training program subject matter includes:

- Hazardous Material Review (Health and Safety)
- Recognition and Identification (placards, labels, and markings)
- Basic Chemistry
- Radioactive Materials (packaging, transportation, and storage)
- Radiation Emergencies (detection, response, and reporting)
- Personal Protective Equipment (respiratory equipment and decontamination)
- Scene Management
- Pre-Incident Planning

### 7.5 CSXT's Train Crew

CSXT train crew personnel will be entering the unit train enclave where they will perform railcar inspections, and pick up or delivery of unit trains. Since CSXT personnel will be limited to the enclave, they will not be required to take FEMP site access training. However, upon arrival, CSXT personnel will require security escorts to accompany them until their unit train transfer activities are complete and they depart the enclave.

## 8.0 PROJECT ORGANIZATION

### 8.1 INTRODUCTION

This section provides a brief description of the overall WPRAP organizational structure and associated responsibilities. WPRAP management is responsible for management and oversight of ARASA and non-ARASA portions of this project.

### 8.2 WPRAP

Figure 8-1 presents the FDF WPRAP organizational structure that is currently planned to support ARASA oversight, transportation, and disposal activities. WPRAP is divided into the following four sections: (1) WPRAP Administration; (2) ARASA Support Operations; (3) WPRAP Shipment/Disposal; and (4) WPRAP Program Support. Specific responsibilities assigned to each WPRAP section are outlined below and are directly overseen by DOE.

#### 8.2.1 WPRAP Administration

This section provides project administrative support including clerical assistance, document control functions, and information management, including both data and records management.

#### 8.2.2 ARASA Support Operations

This section provides operations support to IT. Responsibilities include: (1) on-site operations labor (waste excavation, blending/separation, treatment, loadout, waste traceability, and FAT&LC coordination); (2) operations implementation support (environmental compliance, waste acceptance, radiological control, and emergency response); and (3) administrative support.

#### 8.2.3 WPRAP Shipment/Disposal

This section is responsible for on-site rail movements, rail transport coordination, and waste disposal activities. Specific areas of responsibility include: (1) on-site rail operations (operations coordination, rail operations supervision, train crew and maintenance crew management, security); (2) off-site rail operations (traffic coordination, railroad liaison, emergency response, route community relations); and (3) OU1 waste disposal (CDF, Nevada Test Site/on-site disposal facility, materials control and accountability liaison).

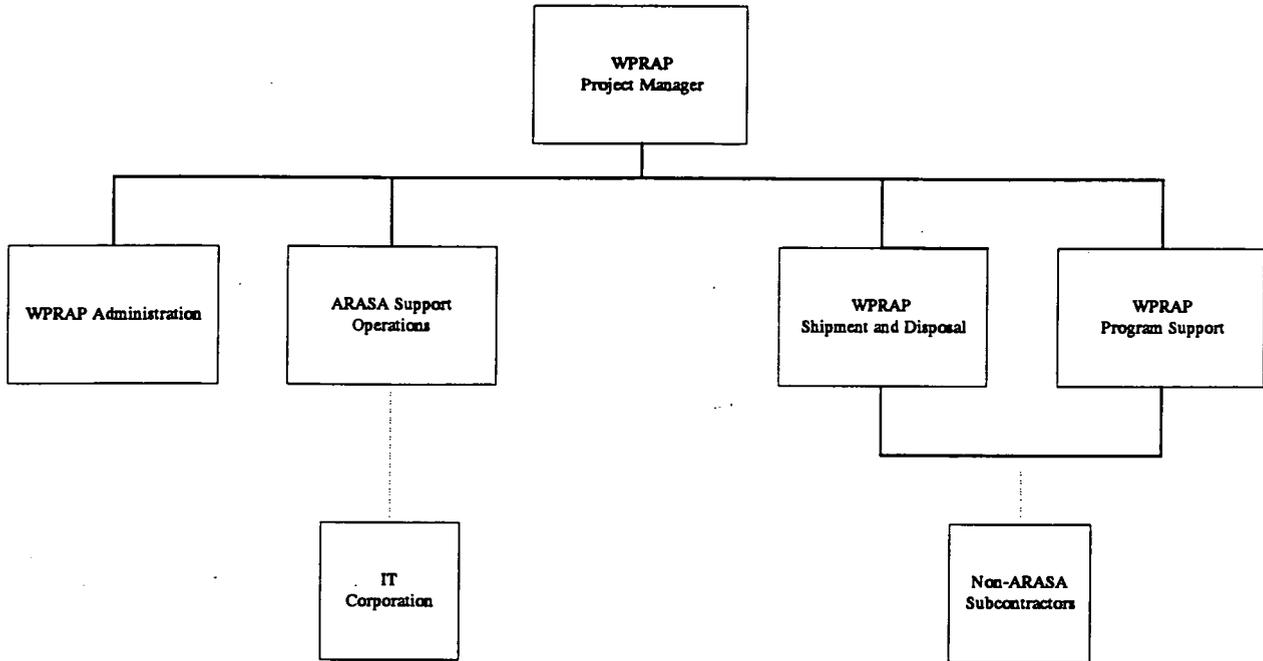
#### 8.2.4 WPRAP Program Support

This section is responsible for the following support duties: (1) engineering (process engineering, radiological engineering, safety analysis, utility coordination), (2) estimating, (3) radiological controls (radiological program management, dosimetry, in vivo monitoring, documentation), (4) cost/schedule support; (5) contracts administration, (6) health and safety program management, (7) conduct of operations program management, (8) matrix support (public affairs, human resources, industrial relations, legal, medical), and (9) training (WPRAP training coordinator, trainers).

#### 8.3 DATA MANAGEMENT AND DOCUMENTATION

Data management procedures are designed to ensure that data generated throughout the life of the project will be initiated, recorded, and maintained efficiently, accurately, and in a manner that can be reproduced. Project documents will be kept to provide a written record of all significant project activities such as maintenance and inspections, waste shipping, and acceptance of railcars. These records will be maintained by Engineering/Construction Document Control in accordance with FEMP procedure, ED-12-5001, *Project Document Control*.

**FIGURE 8-1**  
**ORGANIZATION CHART OF THE WPRAP SECTIONS**



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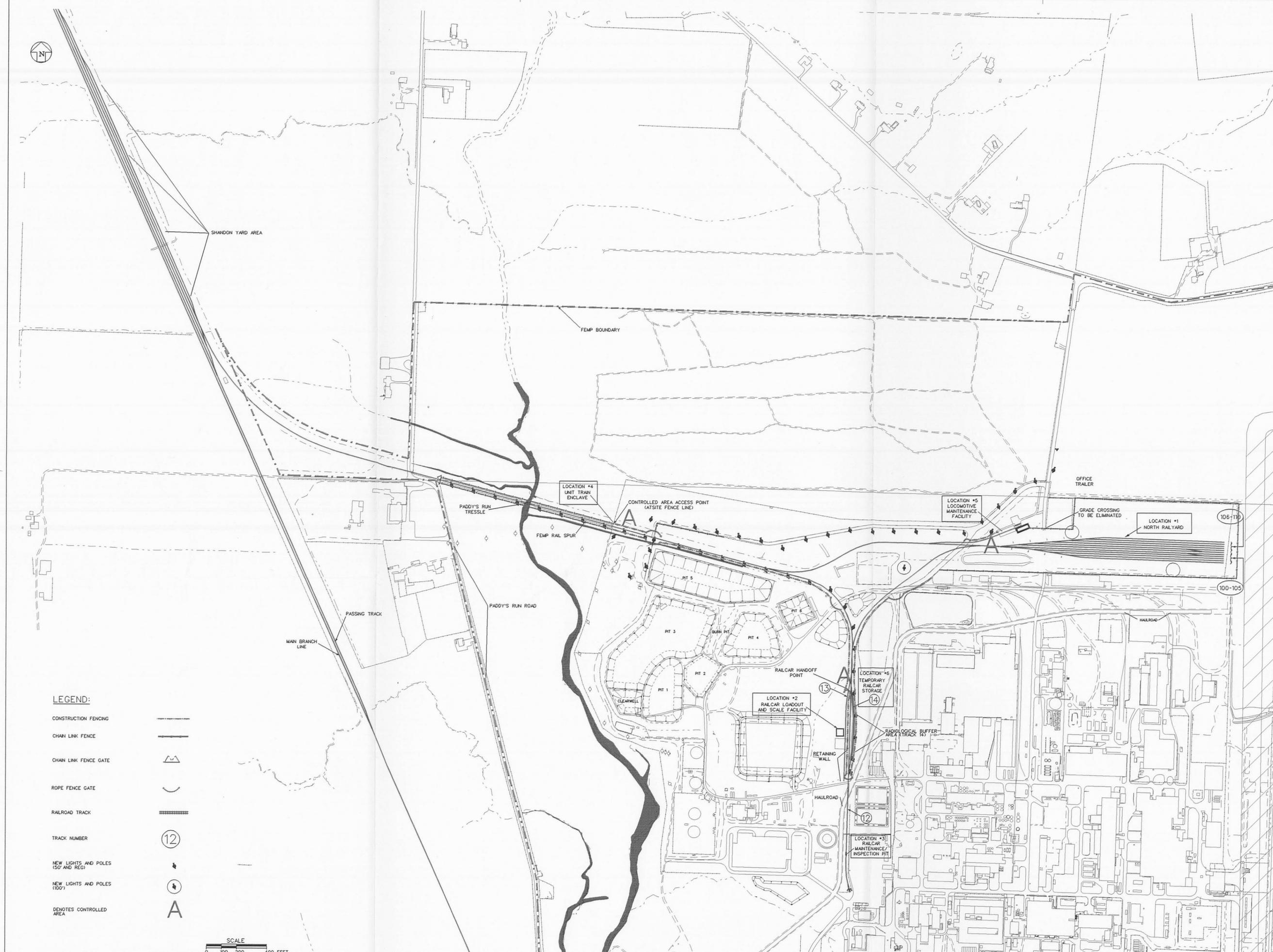
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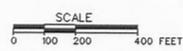
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LEGEND:

- CONSTRUCTION FENCING
- CHAIN LINK FENCE
- CHAIN LINK FENCE GATE
- ROPE FENCE GATE
- RAILROAD TRACK
- TRACK NUMBER
- NEW LIGHTS AND POLES (50' AND REG)
- NEW LIGHTS AND POLES (100')
- DENOTES CONTROLLED AREA



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