4439

IMPLEMENTATION PLAN FOR AREA 6 SOLID WASTE LANDFILL AND FIRE TRAINING FACILITY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

AUGUST 2002

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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LIST OF ACRONYMS AND ABBREVIATIONS

A1PI	Area 1, Phase I
A1PII	Area 1, Phase II
A2PI	Area 2, Phase I
A2PII	Area 2, Phase II
ACGIH	American Conference of Governmental and Industrial Hygienists
ALARA	As Low As Reasonably Achievable
ARAR	applicable or relevant and appropriate requirement
ASCOC	area-specific constituent of concern
AWWT	Advanced Wastewater Treatment (Facility)
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFC	Certified for Construction
CFR	Code of Federal Regulations
COC	constituent of concern
CT	Construction Traveler
dBA	decibels on A-weighted scale
DCN	Design Change Notice
DOE	U.S. Department of Energy
ECDC	Engineering/Construction Document Control
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FPA	Former Production Area
FRL	final remediation level
FTF	Fire Training Facility
FTL	Field Tracking Log
GC	gas chromatography
GIS	Geographical Information System
GMA	Great Miami Aquifer
HPGe	high-purity germanium (detector)
HWMU	hazardous waste management unit
IEMP	Integrated Environmental Monitoring Plan
IIMS	Integrated Information Management Systems
IRDP	Integrated Remedial Design Package
IROD	Interim Record of Decision
µg/kg	micrograms per kilogram
µg/L	micrograms per Liter
mg/kg	milligrams per kilogram
mg/L	milligrams per Liter
mph	miles per hour
msl	mean sea level
MTL	Material Tracking Location
NPDES	National Pollution Discharge Elimination System
NRRP	Natural Resource Restoration Plan
NRT	Natural Resource Trustee
OEPA	State of Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office

LIST OF ACRONYMS AND ABBREVIATIONS

OMTA	OSDF Material Transfer Area
OSDF	On-Site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU	operable unit
PAH	polyaromatic hydrocarbons
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PID	photoionization detector
ppm	parts per million
PSP	Project Specific Plan
PWID	Project Waste Identification and Disposition
QA/QC	Quality Assurance/Quality Control
RA	remedial action
RA28	Removal Action 28
RCI	Request for Clarification of Information
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RD	remedial design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSS	Radiation Scanning System
RTIMP	Real-Time Instrumentation Measurement Program
RTRAK	Radiation Tracking System
S&H	Safety and Health
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SDFP	Soil and Disposal Facility Project
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SMTA	Special Materials Transfer Area
SP-7	Soil Stockpile 7
SWIFTS	Sitewide Waste Information Forecasting and Tracking System
SWL	Solid Waste Landfill
SWMP	Storm Water Retention Basin
SWPPP	Storm Water Pollution Prevention Plan
SWRB	Storm Water Retention Basin
TBC	to be considered criterion
TCLP	toxicity characteristic leachate procedure
UST	underground storage tank
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization
WPRAP	Waste Pits Remedial Action Project
yd^3	cubic yards

EXECUTIVE SUMMARY

This Implementation Plan describes the remediation of soil, sediment, perched water, and at- and below-grade structures and debris in the Solid Waste Landfill (SWL) and Fire Training Facility (FTF) in Remediation Area 6 at the Fernald Environmental Management Project (FEMP), Fernald, Ohio. This Implementation Plan follows the appropriate remedial design/remedial action steps listed in the Sitewide Excavation Plan (SEP; DOE 1998a) (i.e., predesign investigations, remedial design, and remedial action activities). Post-remediation, precertification, certification and restoration will be addressed in future documents [e.g., the Certification Design Letter (CDL) and Natural Resources Restoration Plan (NRRP; DOE 2002a)].

As the integrating document for the Integrated Remedial Design Package (IRDP), the Implementation Plan addresses the predesign investigation, remedial design, remedial actions and precertification activities for both areas. The plan also discusses project-specific environmental controls and monitoring as well as the remedial action management strategy for the SWL and FTF. The Design Criteria Package, predesign characterization data, list of IRDP drawings and specifications, and stormwater calculations are attached to the Implementation Plan as appendices.

The SWL is an approximate 1-acre area mainly used as a sanitary landfill for non-burnable, non-radioactive solid wastes and construction rubble, and double-bagged non-radioactive asbestos between 1974 and 1986. The FTF served as training facility for the FEMP Fire Department and the surrounding community between 1966 and 1990. The area became contaminated with hazardous materials, low-level radioactive materials, and low levels of polychlorinated biphenyls (PCBs) during its operation from the flammable and combustible substances used to start fires.

The primary remedial actions addressed in this Implementation Plan include the following:

- SWL: Removal of approximately 34,500 cubic yards (yd^3) of impacted material including approximately 1,700 yd^3 of uranium above-waste acceptance criteria (WAC) material, and 14,500 yd^3 of debris.

- FTF: Removal of approximately 12,600 yd^3 of impacted material including approximately 2 yd^3 of uranium above-WAC material, 11 yd^3 of technetium-99 above-WAC material, 200 yd^3 of tetrachloroethene (PCE) above-WAC material, and 210 yd^3 of debris.

Following excavation, impacted material will be transported to either the On-Site Disposal Facility or staged for off-site shipment to a permitted disposal facility. The primary constituents of concern are radium-226, radium-228, thorium-228, and thorium-232, and total uranium.

The remedial action requirements shown on the construction drawings and described in the technical specifications were developed in accordance with the concepts described in this Implementation Plan, as guided by the OSDF WAC Attainment Plan for the OSDF (DOE 1998b) and the SEP.

1.0 INTRODUCTION

This Implementation Plan addresses the U.S. Department of Energy's (DOE's) remediation of soil, sediment, and at- and below-grade structures and debris in the Solid Waste Landfill (SWL) and the Fire Training Facility (FTF) at the Fernald Environmental Management Project (FEMP) in southwestern Ohio (Figure 1-1).

Remedial activities in the FTF will take place in accordance with the Operable Unit (OU) 3 Interim Record of Decision (IROD) for Remedial Actions and Responsiveness Summary (DOE 1994) and Record of Decision (ROD) for Remedial Actions at OU3 (DOE 1996a), which address at- and below-grade structures and debris, as well as the ROD for Remedial Actions at OU5 (DOE 1996b), which addresses remediation of soil, sediment and environmental media. Remedial activities in the SWL are planned in accordance with the ROD for Remedial Actions at OU2 (DOE 1995), which addresses the Southern Waste Units, Lime Sludge Ponds and the SWL.

This Implementation Plan and the Sitewide Excavation Plan (SEP; DOE 1998a) satisfy the Amended Consent Agreement [U.S. Environmental Protection Agency (EPA) 1991] requirement for a remedial action (RA) work plan. In addition, this Implementation Plan and the associated remedial design (RD) (construction drawings and technical specifications) constitute the Integrated Remedial Design Package (IRDP), as outlined in the Remedial Design Work Plan for Remedial Actions at OU5 (DOE 1996c). As the integrating document for the IRDP, this Implementation Plan is issued for regulatory agency review of the RD and summarizes the RA scope of work. RAs described in this plan are being conducted in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and corrective action requirements of the Resource Conservation and Recovery Act (RCRA). The Implementation Plan conforms to the general model outline for IRDPs provided in Section 7.0 of the SEP.

To expedite site cleanup, the FEMP was re-organized into nine remediation areas (Figure 1-1) based on the OU concept and including off-site locations adjacent to the FEMP property. The FEMP Sitewide Sequencing Plan, included as Appendix B of the FEMP SEP, provided a generic planning remediation schedule for each area. An updated remediation schedule for the SWL and the FTF are provided in Section 7.0 of this Implementation Plan.

Section 1.0 of this Implementation Plan describes the scope of work for SWL and FTF, including the remedial background and description, scope and general approach of the Implementation Plan, programmatic strategy, summary of regulatory drivers, components of the remedy, and lessons learned.

1.1 REMEDIATION AREA BACKGROUND AND DESCRIPTION

1.1.1 Solid Waste Landfill

The SWL is near the northeast corner of the Waste Storage Area. It covers a flat, rectangular area approximately one acre in size. From approximately 1974 until 1986, the SWL was used for disposal of various types of solid waste. The facility was planned as a sanitary landfill for non-burnable trash, and is reported to contain non-burnable and non-radioactive solid waste, construction-related rubble, and double bagged and bulk quantities of non-radioactive asbestos. Borings sampled as part of the Remedial Investigation/Feasibility Study (RI/FS) indicated that the depth of waste material over most of the landfill to be 10 feet or less below current ground level, although a few borings detected contamination at depths up to 20 feet deep in the southeastern corner. Section 2.0 presents a complete discussion of the SWL constituents of concern (COCs).

1.1.2 Fire Training Facility

The FTF is north of the OU1 Rail Yard near the North Construction Access Road (B Street). The FTF was constructed in 1966 and was used until 1990 as a training facility for the Fernald Site Fire Department and the surrounding community fire departments. As a result, the FTF site and components became contaminated with hazardous materials, low-level radioactive materials, and low levels of polychlorinated biphenyls (PCBs). The FTF was declared a hazardous waste management unit (HWMU) under RCRA in 1991. Removal Action 28 (RA28) was subsequently implemented in July 1994, but above-final remediation level (FRL) COCs are known to remain in the area. Section 3.0 presents a complete discussion of the FTF COCs.

1.2 SCOPE AND GENERAL APPROACH OF THE IMPLEMENTATION PLAN

The SWL/FTF Implementation Plan consists of the following sections:

- Section 1.0 - Introduction, which summarizes the purpose and scope of this Implementation Plan and describes programmatic strategies and requirements for this remedial action project.

- Section 2.0 - Predesign Investigations and Characterization Data for the Solid Waste Landfill, which describes the COCs for the SWL, the surface and subsurface conditions, the nature and extent of contamination, and the anticipated excavation boundaries based on RI/FS data and other data collected to fill data gaps.

- Section 3.0 - Predesign Investigations and Characterization Data for the Fire Training Facility, which describes the COCs for the FTF, the surface and subsurface conditions, the nature and extent of contamination, and the anticipated excavation boundaries based on RI/FS data and other data collected to fill data gaps.

- Section 4.0 - Remedial Action Approach, which presents the work associated with site preparation, above-waste acceptance criteria (WAC) and RCRA excavations, removal of at- and below-grade structures, general excavation to remove man-made structures and contaminated soil, real-time monitoring of the excavation surface, management of waste streams in accordance with final disposition requirements, management of surface and perched water in the excavation, and documentation that the soil in the area meets the final remediation levels (FRLs) for all COCs.

- Section 5.0 - Project-Specific Environmental Controls and Monitoring, which discusses environmental controls and associated monitoring established with respect to natural resources and air, surface water and groundwater pathways.

- Section 6.0 - Project-Specific Health and Safety, which summarizes project-specific health and safety requirements and procedures.

- Section 7.0 - Remedial Action Management Strategy, which discusses the strategy for managing remediation activities, project organization and responsibilities, waste management activities, data and records management, quality assurance/quality control (QA/QC), and integration of SWL/FTF remediation with other FEMP projects.

- Appendix A – Design Criteria Package, which summarizes design criteria, applicable or relevant and appropriate requirements (ARARs) and to be considered (TBC) items.

- Appendix B – Surface Water Calculations, which provides background for sizing culverts to be installed in support of FTF remediation.

- Appendix C – Characterization Data for the SWL, which tabulates all predesign characterization data used to develop the remedial design.

- Appendix D – Characterization Data for the FTF, which tabulates all predesign characterization data used to develop the remedial design.

- Appendix E – List of Drawings and Specifications issued with this Implementation Plan, which are components of the IRDP.

The area-specific RD/RA process at the FEMP is illustrated on Figure 1-1 of the SEP and involves the following steps:

- Predesign investigations
- Remedial design
- Remedial action
- Precertification of excavated areas
- Certification of excavated areas
- Post-remedial action.

1.3 PROGRAMMATIC STRATEGY

This Implementation Plan includes the first of four steps of the programmatic strategy.

Specific performance requirements to accomplish the scope of work presented in this plan are provided in the Design Criteria Package, technical specifications, construction drawings, and the Construction Traveler (CT). The CT will be reviewed and approved by the DOE and Fluor Fernald.

1.3.1 Predesign Investigation

Predesign activities began in the SWL/FTF in 1996. Sampling activities initially focused on material exceeding the On-Site Disposal Facility (OSDF) WAC within the SWL/FTF. The Project Specific Plan (PSP) for Predesign Investigation Sampling in the SWL and the FTF (DOE 2002b) was developed to bound above-WAC concentrations as well as to drive remediation to achieve FRLs. The only above-WAC COC in the SWL is total uranium. Above-WAC concentrations of total uranium, technetium-99 and tetrachloroethene (PCE) have been detected in the FTF. In addition to physical sampling, the SWL/FTF have been surveyed with real-time instruments to assess above-WAC radiological contamination associated with uranium. The remaining surfaces will be surveyed with the real-time instruments after the overlying material is removed to ensure all above-WAC uranium contamination was detected by physical sampling.

1.3.2 Remedial Design

The RD began in February 2002 and continued through completion of the Certified for Construction (CFC) package in June 2002. RD activities include the Advanced Conceptual Design and Title I/II design. Title I/II design for SWL/FTF began in February 2002, and the specifications and drawings submitted with this IRDP build upon the Area 3A/4A excavation designs.

The design-grade for excavation is depicted on the construction drawings and is based on:

- RI/FS data on the nature of COC concentrations in soil and perched groundwater
- Data collected during predesign investigations to delineate the extent of contamination for above-WAC, RCRA, and below-WAC zones
- Excavation slopes that capture building structures and all COC contamination above the FRLs
- Stable side slopes adjacent to the OU1 railroad spur located to the southeast of the SWL to assure safe OU1 waste shipping operations via this railroad spur. This stable side slope may not allow all COC contaminated soil to be excavated.

1.3.3 Remedial Action

The RA for the SWL and FTF will be performed in accordance with Section 4.0 and is scheduled as indicated in Table 7-3.

The final extent of excavation will be based on actual field conditions (e.g., previously unidentified debris), radiological field survey measurements (i.e., real-time surveys), and physical sampling results. In particular, real-time surveys will be used to minimize the excavation volume of above-WAC uranium contamination (Section 4.3) and to evaluate potential reduction of the below-FRL soil volume that is hauled to the OSDF. After the remediation and certification of the immediately surrounding area (Area 6 General Area), the excavation slopes will be reduced to 5:1 and seeded in accordance with the Natural Resource Restoration Plan (NRRP; DOE 2002a). Significant design changes will be documented through the Design Change Notice (DCN) process, and all DCNs will be distributed to EPA and Ohio Environmental Protection Agency (OEPA) for approval.

Impacted material is defined as soil with above-FRL contamination or man-made materials. Additionally, all sediment collected in ditches and retention basins and on erosion control structures (e.g., silt fencing) will be considered impacted. Impacted material will be hauled to the OSDF for disposal if WAC are met. Impacted material that meets the chemical/radiological WAC, but not the physical WAC, will be size-reduced to achieve the WAC and delivered to the OSDF. Items that are prohibited from disposal in the OSDF will be containerized and shipped off site to a permitted disposal facility.

1.3.4 Precertification

The precertification of SWL and FTF have not been performed but will be performed in accordance with Section 4.6.

1.3.5 Certification

As stated in the SEP, a Certification Design Letter (CDL) will be prepared and submitted to the regulatory agencies following completion of the precertification process that summarizes the area-specific remediation completed, results of the precertification activities, and design of the certification sampling and analysis program. Certification of the SWL and FTF will not be governed by this IRDP (refer to Table 7-3 for the submittal schedule).

1.3.6 Postremedial Action

Interim grading of the SWL to obtain long-term stable slopes will be completed after the precertification process. Final restoration and post remedial action will follow interim grading and be guided on a sitewide basis by the final version of the NRRP. FTF postremedial actions are not addressed by this IRDP.

1.4 SUMMARY OF THE REGULATORY DRIVERS

The regulatory requirements, criteria and legal obligations that constitute the drivers for FEMP remediation activities are presented in Section 1.3.1 of the SEP. Those regulatory drivers applicable to the SWL and FTF remediation are summarized in this section.

1.4.1 ARARs and TBCs

Appendix A includes the subset of ARARs and TBCs that will guide remedial actions in SWL/FTF.

1.4.2 Permits

The National Pollutant Discharge Elimination System (NPDES) permit (Permit No. 1IO00004*FD), for storm water and wastewater discharges to Paddys Run and the Great Miami River, is the only permit that is pertinent to SWL/FTF remediation. Storm water discharges from SWL/FTF are sent to the Storm Water Retention Basin (SWRB) or Biodenitrification Surge Lagoon, which are covered under the NPDES permit through the sitewide Storm Water Pollution Prevention Plan (SWPPP). All surface and perched water is treated at the Advanced Wastewater Treatment (AWWT) Facility prior to off-site

discharge, in accordance with protocols listed in Section 4.1.5. Thus, no modifications to the permit are required for SWL/FTF remediation activities.

1.4.3 Natural Resource Trusteeship and Related Natural and Cultural Resource Regulations

Two mechanisms drive protection of natural resources during remediation: the Natural Resource Trusteeship process and compliance with pertinent federal and state regulations. Both of these mechanisms have been incorporated into SWL/FTF remedial designs.

Conceptual restoration designs for the SWL/FTF areas have been presented to the Trustee Council as part of the NRRP. The proposed restoration, which consists of expanded prairie and wetland habitat, will be implemented after approval of the area specific Natural Resource Restoration Design Plan has been reviewed and approved by the Natural Resource Trustees (NRTs). Implementation of restoration activities will occur as close to the completion of required remediation activities as possible.

Regulatory drivers for the management of natural and cultural resources and associated surveys are grouped into three areas: threatened and endangered species protection, wetlands/floodplain protection, and the resolution of DOE's liability for injuries to natural resources.

1.4.3.1 Threatened and Endangered Species

Based on updated FEMP property surveys conducted in 1993 through 1994, DOE does not expect to encounter any federal- or state-listed threatened or endangered species or critical habitat in the areas to be addressed by the SWL/FTF remediation project. Therefore, no additional threatened or endangered species surveys are planned for the area.

1.4.3.2 Wetlands/Floodplains

The 1993 sitewide wetland delineation identified approximately 36 acres of jurisdictional wetlands and 8.9 acres of waters of the United States within the 1,050-acre property. The 1993 Wetland Delineation was approved by the U.S. Army Corps of Engineers, Louisville District Office, in August 1993. Since the 1993 delineation, DOE has identified an additional 1.9 acres of wetlands that have been formed as the result of construction activities at the FEMP. Although DOE plans to avoid or minimize impacts to these areas to the maximum extent practicable during remediation, approximately 10 acres of wetlands have been impacted or are planned to be impacted requiring mitigation. These planned impacts will occur as a

result of CERCLA remediation activities and have been identified in the appropriate OU RODs. Because dredge and/or fill activities will be carried out under CERCLA, notification to the Army Corps of Engineers is not required and EPA is the lead agency regarding wetland mitigation. On June 20, 1995, DOE met with representatives from EPA, OEPA, U.S. Fish and Wildlife Service and the Ohio Department of Natural Resources and determined that mitigation would occur on-property to the extent possible and a mitigation ratio of 1:1.5 would apply to wetlands impacted at the FEMP.

The NRRP includes DOE plans for conducting wetland mitigation activities at the FEMP. The NRRP currently includes plans to conduct two wetland mitigation projects to create the required 15 acres of new wetlands. Any additional wetland mitigation required from unanticipated impacts to wetland will be addressed through implementing the NRRP. Dredge and/or fill activities will be subject to the substantive requirements of Sections 404 and 401 of the Clean Water Act. A permit information summary will be prepared for any impact to wetlands at the FEMP and will be submitted to the appropriate regulatory agencies.

Remediation activities in the SWL will impact less than one acre of wetlands located in a drainage ditch immediately to the north. This impact was anticipated and is part of the 10 acres of planned impact addressed in the RODs. The impact to the wetland will be mitigated through implementation of the NRRP. A permit information summary will be developed to notify the appropriate regulatory agencies of the impact to this wetland.

1.4.3.3 Resolution of DOE's Liability for Injuries to Natural Resources

The NRTs are working to resolve liability that DOE faces for injuries to natural resources under CERCLA. In 1986, the State of Ohio filed a claim against DOE for injuries to natural resources. The claim has been in stay while negotiations are proceeding toward resolution. The State of Ohio has designated OEPA as their trustee representative in matters involving natural resource injuries. The Fernald NRTs have jointly developed the NRRP and have tentatively agreed that DOE, through implementation of the plan, will resolve natural resource liability at the FEMP, including the 1986 State of Ohio claim. The NRTs signed a Memorandum of Understanding in July 2001 formally agreeing to implementation of the NRRP. The NRTs are currently working on a final settlement agreement expected later in 2002.

1.4.3.4 Cultural Resource Management

The DOE, the Ohio Historic Preservation Office (OHPO), and the Advisory Council on Historic Preservation have entered into a "Programmatic Agreement Regarding Archaeological Investigations at the Fernald Environmental Management Project" (March 6, 1997), pursuant to 36 Code of Federal Regulations (CFR) Part 800.13. The SWL/FTF have been surveyed in accordance with this agreement, and all potential historic properties discovered have undergone data recovery after consultation with the OHPO and the Advisory Council on Historic Preservation. No additional archaeological surveys are planned for the SWL/FTF. However, a contingency plan is in place to ensure that any additional cultural resources discovered during remediation activities are recognized and protected (refer to Section 7.5.3).

1.5 COMPONENTS OF THE REMEDY

SWL/FTF remediation activities address specific components of the selected remedies set forth in the OU2, OU3, and OU5 RODs for debris and environmental media, including soil, sediment, perched water, storm water and wastewater. These activities are coordinated closely with OSDF construction (an OU2 ROD remedy component) and decontamination and dismantlement of above-grade structures (an OU3 IROD remedy component), which are being conducted under other FEMP RA plans. A summary of OU2, OU3, and OU5 remedy components (in italics) that are particularly relevant to this plan, and an indication of specific actions that will be taken in SWL/FTF, follows:

- OU2 ROD

  - *Excavation of the OU2 subunits to the required depth established by the RI and FS Reports to remove materials with COC concentrations above the cleanup levels. Excavation will be performed in such a way as to minimize possible dilution of waste and the concept of as low as reasonably achievable (ALARA) will be documented in the Remedial Action Work Plan and implemented during construction.* Based on predesign investigations (Sections 2.0 and 3.0), the material will be excavated as described in Section 4.0. Mitigation measures to minimize short term impacts will be taken with respect to natural and cultural resources (Sections 1.4.3 and 5.1), air pathway (Section 5.2), water pathways (Sections 5.3 and 5.4), and health and safety (Section 6.0).

  - *Verification sampling and testing in the excavated area to confirm that material with COC concentrations above the cleanup levels has been removed. If the results of the verification sampling and testing indicate that contamination above the cleanup levels remains, then additional excavation and verification sampling and testing will be performed until acceptable results are obtained.* Real-time scanning, along with sampling and analysis in the excavated areas, will be conducted to confirm that material with COC levels above FRLs has

been removed. As discussed in Section 7.2 of the SEP, a CDL will detail the proposed certification activities. If results of the certification sampling and analysis indicate that above-FRL contamination remains, supplemental excavation and certification sampling and analysis will be performed. The certification program is discussed in Section 3.4 of the SEP.

- *Segregation of debris (e.g., concrete, steel, pallets, etc.) from OU2 subunits and processing for size reduction, if required, before disposal in the OSDF.* Debris from SWL/FTF excavations will be segregated from soil and soil-like materials for size reduction prior to OSDF disposition (sections 4.3.3 and 4.4.2) in accordance with requirements stated in the WAC Attainment Plan and the Impacted Material Placement Plan.

- *Collection and treatment of the construction water from the OU2 subunits and disposal facility construction areas.* Excavation water generated during SWL/FTF remediation will be collected, and analyzed, if needed, prior to AWWT Phase I or Phase II treatment (Section 4.4.1).

- *Transportation and on-site disposal of excavated material with a concentration at or below 346 picoCuries per gram (pCi/g) of uranium-238, or 1,030 parts per million (ppm) of total uranium.* Material in SWL/FTF that is known to be above FRLs, and meets the OSDF WAC, will be hauled to and placed in the OSDF.

- *Transporation and off-site disposal of approximately 3,100 yd^3 of material with a concentration of uranium-238 above 346 pCi/g, or of total uranium above 1,030 ppm.* Material in SWL/FTF that do not meet the WAC for the OSDF will be handled so that they either meet the WAC of either the OSDF or an off-site facility (includes size reduction or washing).

- *Restoration of OU2 subunits after excavation and verification sampling and testing. Restoration of the OU2 subunits will include grading of the subunits to blend with the surrounding topography, seeding, fencing, and the installation of monitoring wells.* Restoration of SWL/FTF will be conducted in a manner consistent with the NRRP, and will include select backfilling of the excavation, grading areas disturbed by excavation as necessary to restore positive drainage, and establishing interim vegetation cover to prevent erosion.

- OU3 IROD and ROD

  - *Remove gross contamination from material in facilities and dismantle facilities.* Gross contamination will be detected by visual inspection and radiological monitoring during excavation activities. There are no former production facilities within SWL/FTF that contain gross materials to be removed. Contamination will be removed through the excavation of utilities, slabs, foundations, and impacted soils.

- *Release materials (unrestricted/restricted release), as economically feasible, for recycling, reuse, or disposal.* At- and below-grade structures to be excavated generally will be processed (e.g., size reduced), if necessary, and dispositioned in the OSDF. None of these materials are considered to be economically feasible for recycling or reuse.

- *Dispose of process residues, waste product materials, and process-related metals off site.* These materials will be managed in accordance with established protocols as described in Sections 4.4 and 7.5.

- *Treat materials to meet OSDF and/or off-site disposal facility WAC.* No material in SWL/FTF is expected to require treatment to meet OSDF WAC. Excavated materials that exceed OSDF chemical/radiological WAC will be handled as necessary by Fluor Fernald Waste Generator Services to meet the WAC of either the OSDF or an off-site facility, depending on the material.

- *Dispose of materials that exceed the OSDF WAC off site; dispose of remaining materials in the OSDF.* Sections 4.4 and 7.5 discuss material handling and treatment.

- *Establish administrative controls through deed restrictions and access controls.* Access controls will be maintained for SWL/FTF during and following remediation activities.

• OU5 ROD

- *Perform verification sampling to establish horizontal and vertical boundaries of excavation required to attain FRLs for soil and sediment.* Predesign investigations were performed to augment historical data and refine excavation limits, as discussed in Sections 2.0 and 3.0 for the SWL and FTF, respectively.

- *Excavate contaminated soil and sediment as necessary to meet FRLs; use mitigation measures as necessary to minimize potential short-term impacts to human health and the environment.* Based on predesign investigations (Sections 2.0 and 3.0), the material will be excavated as described in Section 4.0. Mitigation measures to minimize short term impacts will be taken with respect to natural and cultural resources (Sections 1.4.3 and 5.1), air pathway (Section 5.2), water pathways (Sections 5.3 and 5.4), and health and safety (Section 6.0).

- *Perform certification sampling following excavation of contaminated soil and sediment to demonstrate that FRLs have been attained.* Real-time scanning, along with sampling and analysis in the excavated areas, will be conducted to confirm that material with COC levels above FRLs has been removed. As discussed in Section 7.2 of the SEP, a CDL will detail the proposed certification activities. If results of the certification sampling and analysis indicate that above-FRL contamination remains, supplemental excavation and certification

sampling and analysis will be performed. The certification program is discussed in Section 3.4 of the SEP.

- *Apply DOE's ALARA principles by using hand-held instruments to support verification sampling and excavation processes and, to the extent economically practical and by using detection limits achievable with hand-held instruments, reduce the remediation level for on-property soil containing relatively nonleachable uranium from 80 ppm to 50 ppm.* Excavation limits were established using the uranium FRLs of 82 and 20 milligrams per kilogram (mg/kg) (Sections 2.1.3 and 3.1.3). Precertification (Section 4.6) and certification activities will be conducted to ensure that FRLs are achieved.

- *Dispose of contaminated soil and sediment that meets the on-site WAC in the OSDF. Where possible, treat soil and sediment that exceeds the OSDF WAC to meet the WAC or treat, if necessary, and dispose of such soil at an off-site facility.* Material in SWL/FTF that is known to be above FRLs, and meets the OSDF WAC, will be placed in the OSDF. Other materials that do not meet the WAC for the OSDF will be handled so that they either meet the WAC of either the OSDF or an off-site facility (includes size reduction or washing).

- *Excavate contaminated soil containing perched water that presents an unacceptable threat to the underlying aquifer through contaminant migration; dispose of this excavated soil in a manner consistent with methods indicated above for soil; treat the perched water and storm water collected during these excavation operations, as required (treatment in AWWT preceded, if necessary, by pretreatment to address any listed hazardous wastes).* Excavations will be pumped to collect and manage perched water appropriately. Water with volatile organic compounds (VOCs) will be routed to the AWWT Phase II system. Storm water will be collected and routed to the SWRB for treatment through the AWWT Phase I system.

- *Collect contaminated storm water, using the existing FEMP retention basin, as necessary to minimize discharge of contaminants to Paddys Run; dewater sludges from the basin and dispose of them in the OSDF or, if they exceed OSDF WAC, in an appropriate off-site facility. Collect and treat contaminated storm water and wastewater as necessary to attain FRLs in Paddys Run and the Great Miami River and mass-based limits for discharges to the Great Miami River.* Storm water will be pumped from excavations and routed to the SWRB for subsequent treatment through the AWWT Phase I system.

- *Continue to employ institutional controls, including access controls and monitoring, to ensure continued protectiveness.* Access to the SWL/FTF will be restricted using barriers, warning signs, and procedural controls for the duration of remedial activities. Similarly, monitoring will continue to be conducted in accordance with the Integrated Environmental Monitoring Plan (IEMP; DOE 2001a). Long-term institutional controls necessary to implement restoration goals under the site's selected remedy are presented in the NRRP.

- *Restore the site.* Restoration of SWL/FTF will be conducted in a manner consistent with the NRRP, and will include select backfilling of the excavation, grading areas disturbed by excavation as necessary to maintain long-term stable slopes, restore positive drainage, and establishing interim vegetation cover to prevent erosion.

1.6 LESSONS LEARNED

A lessons learned program has been implemented to apply knowledge accumulated during successive remedial efforts conducted under the SEP. Lessons learned from past remedial activities in Area 1, Phase I (A1PI), Area 1, Phase II (A1PII), and Area 2, Phase I (A2PI) and Area 3A/4A have been incorporated into the Area 6 SWL/FTF IRDP to ensure that remedial activities carried out under this plan meet all applicable requirements and achieve the highest quality level possible. Some of the most important lessons include:

- Establish a single project director that is responsible for the entire remedial effort in an area
- Obtain regulatory approval on PSPs prior to implementing the work
- Complete sampling and analysis activities before submitting IRDP (if possible), and include all data in the Implementation Plan
- Identify excavation depth and sample control points on figures
- Perform continuous visual observation of the excavation face to identify and segregate special material
- Design drawings and continuous visual observation of deep excavations will be used to identify the contact between the glacial overburden and Great Miami Aquifer (GMA) material (not relevant to this IRDP)
- *In situ* gamma spectroscopy will not be proposed as an analytical method for certification activities.

Because the general complexity of remedial activities varies from area to area, soil remediation approaches at the FEMP will continue to evolve with each successive remedial effort.

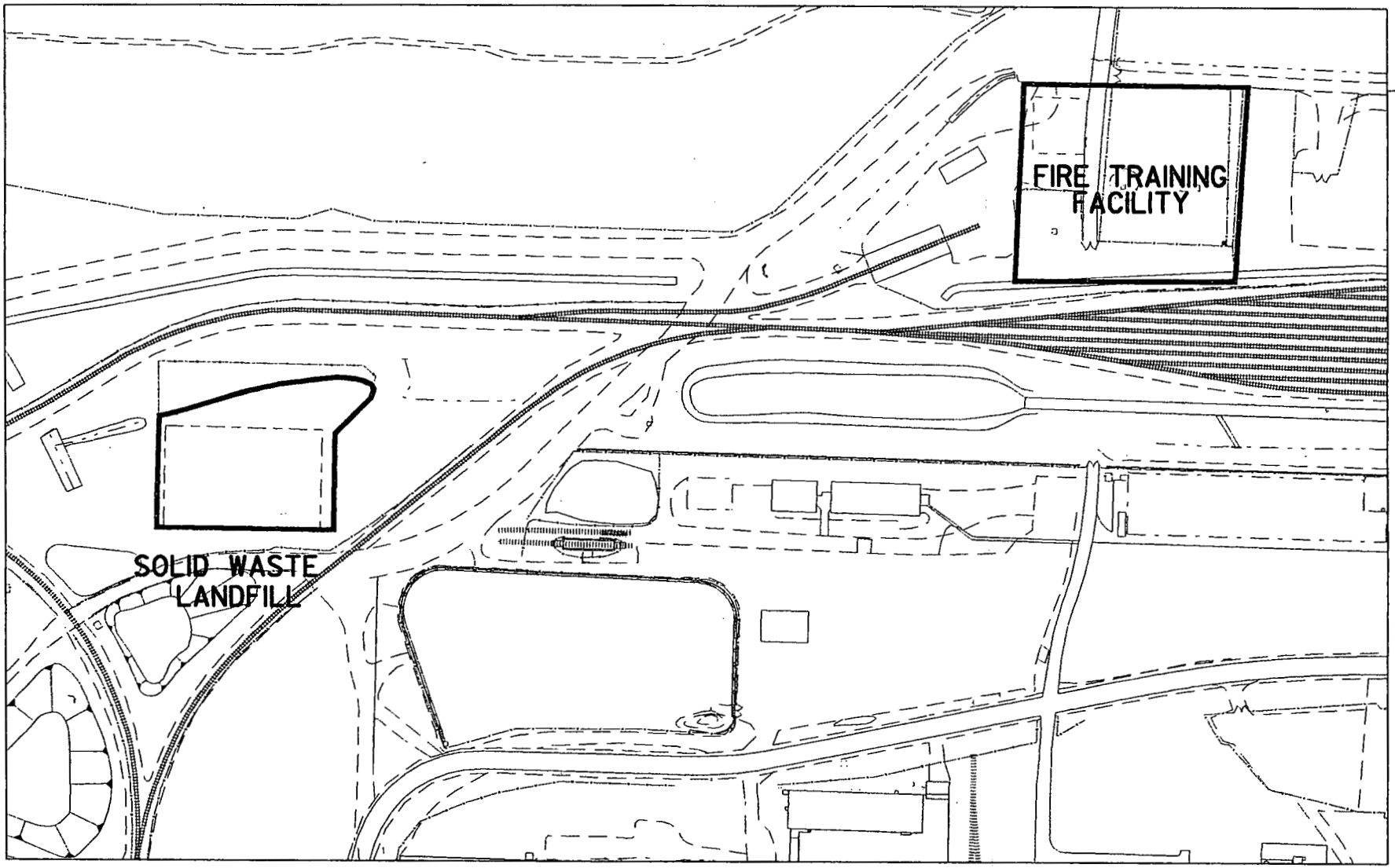

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FIGURE 1-1. LOCATION MAP FOR THE SOLID WASTE LANDFILL AND THE FIRE TRAINING FACILITY

2.0 PREDESIGN INVESTIGATIONS AND CHARACTERIZATION DATA FOR THE SOLID WASTE LANDFILL

2.1 SUMMARY OF THE RI/FS INVESTIGATION

Extensive soil sampling was performed at the FEMP in the late 1980s and early 1990s as part of the RI/FS to characterize the nature and extent of contamination resulting from decades of uranium-metal production. Figure 2-1 shows RI/FS soil boring locations in the SWL. Most locations shown on the figure represent multiple samples collected at depths ranging from 0.5 to 26 feet below the surface (i.e., each boring location was used to collect multiple samples).

2.1.1 Preliminary Constituents of Concern

Based on results of the RI/FS investigation, the SEP presented a preliminary list of area-specific constituents of concern (ASCOCs) for Remediation Area 6 (Table 2-1) and stated that a more thorough screening of ASCOCs would be performed for each remediation area during the design phase. Section 2.5 discusses the additional screening for the SWL.

2.1.2 OSDF Waste Acceptance Criteria

The OSDF WAC were established in the OU2 and OU5 RODs (Table 2-2). Soil excavated from the SWL must meet these concentration-based WAC to be eligible for disposal in the OSDF. Soil exceeding OSDF radiological WAC will have to be segregated for off-site disposal. The RI/FS data were used to identify areas that exceed the OSDF WAC and to determine the areas that require additional data to delineate the extent of the above-WAC contamination. Section 2.3 describes the sampling performed to further delineate above-WAC contamination.

2.1.3 Final Remediation Levels for Soil

The OU5 ROD established the FRLs for soil remediation (Table 2-3). FRLs are the cleanup goals for the FEMP and are defined as the average concentration of a constituent that can remain in the soil and be considered protective of human health and the environment. Remediation in the SWL will remove contaminated soil until the residual concentration of constituents is at or below the respective FRL. The FRL for total uranium is 38.6 mg/kg in the SWL per the ALARA philosophy. The ALARA goal of 38.6 mg/kg will be reached if soil exceeding 38.6 mg/kg is within one lift thickness (i.e., 3 feet ±1 foot) of soil exceeding the uranium FRL of 82 mg/kg.

RI/FS data were searched to identify all areas containing above-FRL concentrations for the preliminary COCs in the SWL. The search results were used to establish the areas where additional data were needed to delineate the extent of above-FRL contamination. Section 2.3 discusses the sampling performed to further delineate the above-FRL contamination.

2.1.4 Hazardous Waste Management Units

There are no HWMUs associated with the SWL.

2.1.5 Underground Storage Tanks

There are no underground storage tanks (USTs) located in the SWL area.

2.1.6 Identification of Potentially Characteristic Areas

Based on historical process knowledge and soil contaminant concentration levels identified through the OU2 RI/FS investigation, the SWL had a reasonable potential for containing RCRA characteristic waste that provided an opportunity for treatment. Additional testing was conducted to make the determination. Section 2.3.1 summarizes the results of this testing.

2.2 SUMMARY OF SURFACE AND SUBSURFACE PHYSICAL CONDITIONS

The SWL covers a flat, rectangular area approximately one acre in size and has been inactive since 1986. Although its operational history is not well documented, limited existing records indicate that dumping commenced in mid-1974. The facility was planned as a sanitary landfill for non-burnable trash. Materials reportedly buried include non-burnable and non-radioactive solid wastes (cafeteria waste, rubbish, etc.), non-radioactive construction-related rubble, medical wastes, and double-bagged, bulk quantities of non-radioactive asbestos.

RI/FS borings indicated the depth of waste material over most of the landfill to be 10 feet or less below the current ground level, although a few borings detected waste material at depths up to 20 feet in the southeastern corner. The total volume of waste material is calculated to be approximately 14,425 yd^3. During a 1992 trenching investigation, burnable wastes (bagged trash and wood), possible burnable trash (respirator cartridges, asphalt roofing materials, autoclaved medical wastes, fire hoses, and rubber hoses/belts), and non-burnable wastes (unidentified high activity radioactive waste, medicine vials,

bagged asbestos, ceramic tiles, possible magnesium fluoride, glass acid bottles, steel cables/cans, paint cans and copper tubing) were encountered.

During the RI/FS, 23 COCs were identified for the SWL, with maximum concentrations in the southeastern corner. As stated in the OU2 ROD, the number of COCs detected in the surface water, sediment and perched groundwater are fewer than those detected in the surface and subsurface soils.

2.3 SUMMARY OF PREDESIGN INVESTIGATIONS

The specific predesign investigation goals included filling RI/FS data gaps on the nature and extent of contamination in the SWL, confirming questionable analytical results, bounding above-WAC or above-FRL areas, investigating potential RCRA characteristic areas, and confirming the location of above-WAC areas through real-time scanning. Two predesign investigations were completed to meet these goals:

- *PSP for Sampling of Miscellaneous Areas for OSDF WAC Attainment (DOE 2001b)*

  This PSP was developed to investigate WAC uncertainties in three locations, one of which was the SWL. A small area in the southeastern quadrant of the SWL was sampled to confirm/bound above-WAC uranium contamination that was initially identified during the RI/FS investigation. One of the sample locations was also tested for RCRA-characteristic lead. These sample locations are shown on Figure 2-2.

- *PSP for Predesign Sampling in the SWL and FTF (DOE 2002b)*

  This PSP was developed to conduct predesign sampling and real-time data collection in the SWL and FTF. This sampling activity was conducted to further bound above-WAC material, to fill data gaps, to support the remedial excavation design, and to determine the appropriate disposal method for SWL material.

Sections 2.3.1 and 2.3.2 summarize and discuss the sampling and analysis performed under each of these investigations. Appendix C includes analytical results from the predesign investigation.

2.3.1 Potentially Characteristic Areas

RI/FS data indicated that the lead concentration at one SWL location exceeded the 20-times toxicity characteristic leachate procedure (TCLP) regulatory limit. A second boring was established alongside this location and sampled for lead using TCLP under the Miscellaneous Areas PSP. The result indicated

that lead levels were below the 20-times rule threshold; therefore, lead was eliminated from the list of ASCOCs in the SWL and it is not considered a potentially characteristic area.

2.3.2 Surface and Subsurface Investigations

Predesign sampling focused on identifying soil that exceeded the OSDF WAC so that it could be segregated for off-site disposal and on supporting the excavation design. Real-time scanning and physical sampling were used to vertically bound the contamination.

2.3.2.1 Real-Time Scanning

The Real-Time Radiation Tracking System (RTRAK) is used for larger flat areas that are readily accessible. The Radiation Scanning System (RSS) is used for smaller areas, gradual slopes, or areas not accessible by the RTRAK. The high-purity germanium (HPGe) detector is used for areas that are inaccessible to both the RTRAK and the RSS. A walkdown of the area by Characterization and/or Real-Time Implementation Measurement Program (RTIMP) representatives may be required to determine the appropriate type of *in situ* gamma spectroscopy equipment needed. The decision to use any of these evaluation techniques will be made by the Characterization Manager and RTIMP Field Manager or their designees.

Real-time scanning was performed on all accessible soil in the SWL. Figure 2-3 shows RTRAK and RSS traverses as patterns composed of small squares. The scanning was completed under the PSP for Predesign Sampling in the SWL and FTF.

Based on the real-time scanning results, above-FRL trigger levels were identified in the southeastern to south central portion of the SWL, where above-WAC concentrations of total uranium were known to have existed based on sampling conducted under the Miscellaneous Areas PSP. These areas were re-sampled under the Predesign PSP and the above-WAC contamination was bounded.

2.3.2.2 Physical Sampling

A search of the Sitewide Environmental Database (SED) for data from all SWL borings indicated that total uranium was the only constituent that exceeded OSDF WAC. These above-WAC locations were sampled under the Miscellaneous Areas PSP. The results indicated that above-WAC concentrations of total uranium were confined to the southeastern portion of the SWL. Seven adjacent borings were

established under the Miscellaneous Areas PSP and sampled to confirm these results. Table 2-4 lists the above-WAC results identified in this sampling activity.

The Predesign PSP sampling strategy involved establishing borings to determine if any additional above-WAC locations were present within the SWL as well as to fill any gaps in the data set. A base interval to assess FRL status was also collected to conservatively bound all above-FRL material. The WAC COCs were total uranium, identified as the only above-WAC constituent in the SWL based on Miscellaneous Areas PSP sampling, and technetium-99, which was retained due to the variety of the material that was dispositioned into the SWL as well as the high concentrations of technetium-99 across the site. All primary and secondary COCs for Area 6, as specified in the SEP, were analyzed during this investigation for FRL attainment.

Predesign borings were advanced to a depth of at least 3 feet below the detected above-FRL contamination zone for investigation. For example, since above-FRL contamination had been identified at the 22-foot interval in the middle section of the SWL, the predesign boring at that location was advanced to depths of 24 to 26 feet. This sampling method was used to support the planned SWL excavation design. Historical data indicated above-FRL concentrations of thorium-228, thorium-232, uranium and arsenic; however, due to the variety of material placed in the SWL, all primary and secondary Area 6 COCs were analyzed for FRL attainment under the Predesign PSP. Twenty-two borings and 145 associated analyses (Appendix C) have been completed under the Predesign Sampling PSP. Figure 2-4 shows all Predesign PSP boring locations in the SWL.

Extent of Contamination

The sample results obtained under the OSDF Miscellaneous Areas and Predesign PSPs indicated that all above-FRL contamination has been bound at depth for the entire SWL footprint, and this region of the FEMP should be ready for certification design following the completion of remedial activities. Tables 2-4 through 2-6 list the above-WAC and above-FRL analytical results.

2.4 HIGH-LEACHABILITY ZONES

The SWL is not considered a high-leachability area. The FRLs for this portion of the FEMP were established in the OU2 ROD.

2.5 IDENTIFICATION OF AREA-SPECIFIC CONSTITUENTS OF CONCERN

Table 2-1 identifies the preliminary list of COCs for Area 6, which was based on the results of sampling and analysis performed during the RI/FS investigation. Based on the results of predesign sampling and analysis, Table 2-7 presents the revised list of COCs that will be used for the SWL. The list of primary COCs has remained the same since these are sitewide COCs, while some of the secondary COCs have been eliminated. The COCs were chosen based on either of the following two criteria:

- The constituent is widespread in the SWL and is commonly found at above-FRL concentrations (i.e., the primary COCs)
- The constituent is present at above-FRL concentrations at depths that drive the design excavation contours in those areas.

2.6 ANTICIPATED EXCAVATION BOUNDARIES

Excavation boundaries for the SWL are established based on the following information:

- Above-WAC and above-FRL areas which are established based on physical sampling results
- Constructability and safe-slope configurations necessary to effectively excavate the material.

All of this information is combined to form a complete picture of the volume of material that should be excavated from the SWL. Table 2-8 summarizes the soil volumes associated with the excavation driver (in this instance, above-WAC total uranium concentrations). Additional discussion on the above-WAC and above-FRL excavation boundaries is provided below. Section 4.0 provides the excavation volumes for soil and debris.

2.6.1 Above-WAC Material

Total uranium is known to be the only above-WAC constituent in the SWL. Therefore, the excavation volume was determined based on a straight wall excavation at bounding points. The above-WAC design excavation depths are shown on the SWL and FTF Grading/Drainage Plan (SWL) drawing included with this IRDP.

2.6.2 Above-FRL Material

The amount of excavation necessary to capture all above-FRL soil and debris is determined by manually plotting the location of the contamination, drawing an excavation shape around the contamination, establishing the depths of excavation and fitting safe slopes to the indicated depths. The fitted safe slopes correspond to the design excavation depths, as shown on Figure 2-5.

To verify that above-FRL soil has been captured by the excavation profiles shown on Figure 2-5, the depth of each above-FRL sample result was compared to the design excavation depth at the same location. If the sample depth was deeper than the excavation depth, the excavation contours were adjusted to capture the additional above-FRL material. The depths are plotted relative to mean sea level (msl) (i.e., 580 is deeper than 590), as shown on Figure 2-6, and the diagonal line corresponds to a slope of 1:1 where excavation depths equal above-FRL depths. This figure demonstrates that all above-FRL sample points fall below the line and are therefore captured by the designed excavation (i.e., the sample depth is shallower than the excavation depth at that location).

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TABLE 2-1
PRELIMINARY AREA-SPECIFIC CONSTITUENTS OF CONCERN

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Aroclor-1260
Thorium-228	Arsenic
Thorium-232	Benzo(a)pyrene
Total Uranium	Benzo(b)fluoranthene
	Beryllium
	Bromodichloromethane[a]
	Cesium-137
	Dibenzo(a,h)anthracene
	1,1-Dichloroethene
	Dieldrin
	Fluoride
	Heptachloradibenzo-p-dioxins
	Indeno(1,2,3-cd)pyrene
	Octachlorodibenzo-p-dioxin
	Technetium-99
	Tetrachloroethene
	Thorium-230
	Ecological COCs
	Silver
	Antimony
	Cadmium
	PAHs[b]

a Not detected above the FRL in the remediation area, but the non-detect value is greater than the FRL

b Polyaromatic hydrocarbons (PAHs) include benco(a)anthracene, benco(B)fluoranthene, benco(G,H)perlene, benco(K)fluoranthene, fluoranthene, chrysene, dibenco(A,H)anthracene, Indeno(1,2,3-Co)pyrene, phenantrene, pyrene

TABLE 2-2
OSDF WASTE ACCEPTANCE CRITERIA

WAC Constituent	Maximum Concentration
Neptunium-237	3.12×10^{9} pCi/g
Strontium-90	5.67×10^{10} pCi/g
Technetium-99	29.1 pCi/g
Total Uranium	1030 mg/kg
Alpha-chlordane	2.89 mg/kg
Bis(2-chloroisopropyl)ether	2.44×10^{-2} mg/kg
Bromodichloromethane	9.03×10^{-1} mg/kg
Carbazole	7.27×10^{4} mg/kg
Chloroethane	3.92×10^{5} mg/kg
1,1-Dichloroethene	11.4 mg/kg
1,2-Dichloroethene	11.4 mg/kg
4-Nitroaniline	4.42×10^{-2} mg/kg
Tetrachloroethene	128 mg/kg
Toxaphene	1.06×10^{5} mg/kg
Trichloroethene	128 mg/kg
Vinyl chloride	1.51 mg/kg
Boron	1.04×10^{3} mg/kg
Mercury	5.66×10^{4} mg/kg

TABLE 2-3
ROD SOIL FINAL REMEDIATION LEVELS

Constituent	Final Remediation Level
Radionuclides	
Cesium-137	1.4 pCi/g
Neptunium-237	3.2 pCi/g
Plutonium-238	78 pCi/g
Radium-226	1.8 pCi/g
Radium-228	2.0 pCi/g
Strontium-90	14 pCi/g
Technetium-99	30 pCi/g
Thorium-228	1.8 pCi/g
Thorium-230	280 pCi/g
Thorium-232	1.5 pCi/g
Uranium, Total (outside a high-leachability area)	38.6 mg/kg
Inorganics	
Arsenic	12 mg/kg
Beryllium	1.5 mg/kg
Fluoride	78,000 mg/kg
Lead	400 mg/kg
Organics	
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzo(a)anthracene	20 mg/kg
Benzo(a)pyrene	2 mg/kg
Benzo(b)fluoranthene	20 mg/kg
Bromodichloromethane	4 mg/kg
Carbazole	12,000 µg/kg
Dibenzo(a,h)anthracene	2 mg/kg
1,1-Dichloroethene	0.41 mg/kg
Dieldrin	0.015 mg/kg
Heptachlorodibenzo-p-dioxins	800 ng/kg
Indeno(1,2,3-cd)pyrene	20 mg/kg
Octachlorodibenzo-p-dioxin	8800 ng/kg
Tetrachloroethene	3.6 mg/kg
Trichloroethene	25 mg/kg

TABLE 2-4
TOTAL URANIUM ABOVE-WAC DATA SUMMARY

Boring ID	Depth (feet)	Above-WAC Value	WAC Limit
		Current Data	
A6-SWL-20	5	1325 mg/kg	1030 mg/kg
A6-SWL-5	4	8719 mg/kg	1030 mg/kg
A6-SWL-5	5	36950 mg/kg	1030 mg/kg
		Historical Data	
SWL-6	6.5	1200 mg/kg	1030 mg/kg
1722	4.5	1260 mg/kg	1030 mg/kg
1986	2.5	1280 mg/kg	1030 mg/kg
SWL-7	3.5	1580 mg/kg	1030 mg/kg
SWL-6	5.5	1720 mg/kg	1030 mg/kg
11036	5	1730 mg/kg	1030 mg/kg

TABLE 2-5
URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-FRL Value	FRL Limit
		Current Data		
A6-SWL-12	1	Total Uranium	42.3 mg/kg	38.6 mg/kg
A6-SWL-15	1	Total Uranium	44.6 mg/kg	38.6 mg/kg
A6-SWL-17	1	Total Uranium	45.9 mg/kg	38.6 mg/kg
A6-SWL-18	1	Total Uranium	47.7 mg/kg	38.6 mg/kg
A6-SWL-11	1	Total Uranium	55.4 mg/kg	38.6 mg/kg
A6-SWL-8	6	Total Uranium	62.2 mg/kg	38.6 mg/kg
A6-SWL-10	1	Total Uranium	64.5 mg/kg	38.6 mg/kg
A6-SWL-13	1	Total Uranium	76.7 mg/kg	38.6 mg/kg
A6-SWL-14	1	Total Uranium	95.6 mg/kg	38.6 mg/kg
A6-SWL-12	6	Total Uranium	106 mg/kg	38.6 mg/kg
A6-SWL-13	6	Total Uranium	116 mg/kg	38.6 mg/kg
A6-SWL-9	3	Total Uranium	118 mg/kg	38.6 mg/kg
A6-SWL-5	3	Total Uranium	192 mg/kg	38.6 mg/kg
A6-SWL-9	5	Total Uranium	240 mg/kg	38.6 mg/kg
A6-SWL-5	6	Total Uranium	293 mg/kg	38.6 mg/kg
A6-SWL-9	4	Total Uranium	335 mg/kg	38.6 mg/kg
A6-SWL-20	5	Total Uranium	1325 mg/kg	38.6 mg/kg
A6-SWL-5	4	Total Uranium	8719 mg/kg	38.6 mg/kg
A6-SWL-5	5	Total Uranium	36950 mg/kg	38.6 mg/kg
		Historical Data		
CIS_SYSGEN_826	0.5	Uranium-238	13.5 pCi/g	12.8 pCi/g*
SWL-SS-01	0.5	Uranium-238	13.6 pCi/g	12.8 pCi/g*
1993	5	Uranium-238	15.3 pCi/g	12.8 pCi/g*
SWL-SS-02	0.5	Uranium-238	34.6 pCi/g	12.8 pCi/g*
1722	14	Uranium-238	37.7 pCi/g	12.8 pCi/g*
CIS_SYSGEN_807	0.5	Uranium-238	37.8 pCi/g	12.8 pCi/g*
SWL-1	3	Total Uranium	46.6 mg/kg	38.6 mg/kg
SWL-2	2	Total Uranium	51.7 mg/kg	38.6 mg/kg
1808	3	Total Uranium	52.0325 mg/kg	38.6 mg/kg
SWL-6	8	Total Uranium	52.1 mg/kg	38.6 mg/kg
1035	22.5	Total Uranium	52.273 mg/kg	38.6 mg/kg
SWL-1	7	Total Uranium	53 mg/kg	38.6 mg/kg
1035	22.5	Total Uranium	54.274 mg/kg	38.6 mg/kg
11078	0.5	Total Uranium	59 mg/kg	38.6 mg/kg
1985	4	Total Uranium	59.156 mg/kg	38.6 mg/kg
SWL-2	3	Total Uranium	60.7 mg/kg	38.6 mg/kg
1808	12	Total Uranium	60.78 mg/kg	38.6 mg/kg
1982	2.5	Total Uranium	60.87 mg/kg	38.6 mg/kg
1808	12	Total Uranium	62.78 mg/kg	38.6 mg/kg
1985	2	Total Uranium	64 mg/kg	38.6 mg/kg
SWL-5	1	Total Uranium	65.5 mg/kg	38.6 mg/kg
1718	3	Total Uranium	66.54 mg/kg	38.6 mg/kg
SWL-5	2	Total Uranium	67.6 mg/kg	38.6 mg/kg

TABLE 2-5
URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-FRL Value	FRL Limit
SWL-1	2	Total Uranium	72.7 mg/kg	38.6 mg/kg
1985	2	Total Uranium	74 mg/kg	38.6 mg/kg
SWL-7	3	Total Uranium	76.1 mg/kg	38.6 mg/kg
SWL-SS-08	0.5	Total Uranium	80.436 mg/kg	38.6 mg/kg
CIS_SYSGEN_814	0.5	Total Uranium	83.959 mg/kg	38.6 mg/kg
SWL-2	1.0	Total Uranium	84.3 mg/kg	38.6 mg/kg
SWL-6	8.5	Total Uranium	87.7 mg/kg	38.6 mg/kg
SWL-SS-04	0.5	Total Uranium	88.087 mg/kg	38.6 mg/kg
CIS_SYSGEN_815	0.2	Total Uranium	90.256 mg/kg	38.6 mg/kg
1983	2.5	Total Uranium	90.952 mg/kg	38.6 mg/kg
1986	7.5	Total Uranium	94 mg/kg	38.6 mg/kg
SWL-7	4	Total Uranium	98.2 mg/kg	38.6 mg/kg
SWL-SS-02	0.5	Total Uranium	103.356 mg/kg	38.6 mg/kg
SWL-3	1	Total Uranium	106 mg/kg	38.6 mg/kg
1985	2	Total Uranium	113 mg/kg	38.6 mg/kg
1988	5	Total Uranium	113.166 mg/kg	38.6 mg/kg
CIS_SYSGEN_804	0.5	Total Uranium	113.345 mg/kg	38.6 mg/kg
1718	10.5	Total Uranium	121.953 mg/kg	38.6 mg/kg
1991	10	Total Uranium	133 mg/kg	38.6 mg/kg
1720	3	Total Uranium	135.114 mg/kg	38.6 mg/kg
Trench 1	7	Total Uranium	140.505 mg/kg	38.6 mg/kg
1722	14	Total Uranium	143.112 mg/kg	38.6 mg/kg
1986	7.5	Total Uranium	146 mg/kg	38.6 mg/kg
SWL-SS-05	0.5	Total Uranium	148.573 mg/kg	38.6 mg/kg
CIS_SYSGEN_812	0.2	Total Uranium	164.620 mg/kg	38.6 mg/kg
SWL-6	6	Total Uranium	165 mg/kg	38.6 mg/kg
1992	10	Total Uranium	180.292 mg/kg	38.6 mg/kg
SWL-SS-03	0.5	Total Uranium	190.775 mg/kg	38.6 mg/kg
11038	2.5	Total Uranium	234.068 mg/kg	38.6 mg/kg
CIS_SYSGEN_804	0.5	Total Uranium	255.176 mg/kg	38.6 mg/kg
SWL-6	7.5	Total Uranium	289 mg/kg	38.6 mg/kg
CIS_SYSGEN_807	1	Total Uranium	298.655 mg/kg	38.6 mg/kg
CIS_SYSGEN_807	1.5	Total Uranium	320.844 mg/kg	38.6 mg/kg
11039	5	Total Uranium	356.830 mg/kg	38.6 mg/kg
SWL-6	5	Total Uranium	508 mg/kg	38.6 mg/kg
1990	9	Total Uranium	509.686 mg/kg	38.6 mg/kg
SWL-6	7	Total Uranium	652 mg/kg	38.6 mg/kg
Trench	5.5	Total Uranium	724 mg/kg	38.6 mg/kg
SWL-6	4	Total Uranium	747 mg/kg	38.6 mg/kg
SWL-1	4	Total Uranium	972 mg/kg	38.6 mg/kg
CIS_SYSGEN_804	1	Total Uranium	989.889 mg/kg	38.6 mg/kg
SWL-6	6.5	Total Uranium	1200 mg/kg	38.6 mg/kg
1722	4.5	Total Uranium	1260 mg/kg	38.6 mg/kg
1986	2.5	Total Uranium	1280 mg/kg	38.6 mg/kg

TABLE 2-5
URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-FRL Value	FRL Limit
SWL-7	3.5	Total Uranium	1580 mg/kg	38.6 mg/kg
SWL-6	5.5	Total Uranium	1720 mg/kg	38.6 mg/kg
11036	5	Total Uranium	1730 mg/kg	38.6 mg/kg

* The FRL for uranium is based on the total uranium concentration in mass units. This value is the conversion of the FRL into the activity concentration based on uranium-238 being 99 percent of all uranium present.

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TABLE 2-6
NON-URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-FRL Value	FRL Limit
		Current Data		
A6-SWL-03	15	Radium-226	1.93 pCi/g	1.8 pCi/g
A6-SWL-20	1	Thorium-228	2.3 pCi/g	1.8 pCi/g
A6-SWL-20	2	Thorium-228	2.3 pCi/g	1.8 pCi/g
A6-SWL-20	3	Thorium-228	2.5 pCi/g	1.8 pCi/g
A6-SWL-20	4	Thorium-228	3.0 pCi/g	1.8 pCi/g
A6-SWL-20	5	Thorium-228	2.8 pCi/g	1.8 pCi/g
A6-SWL-20	1	Thorium-232	2.1 pCi/g	1.5 pCi/g
A6-SWL-20	2	Thorium-232	2.4 pCi/g	1.5 pCi/g
A6-SWL-20	3	Thorium-232	2.4 pCi/g	1.5 pCi/g
A6-SWL-20	4	Thorium-232	2.7 pCi/g	1.5 pCi/g
A6-SWL-20	5	Thorium-232	2.7 pCi/g	1.5 pCi/g
A6-SWL-03	15	Arsenic	12.5 mg/kg	12 mg/kg
A6-SWL-03	15	Beryllium	1.54 mg/kg	1.5 mg/kg
A6-SWL-11	18	Benzo(a)pyrene	3.5 mg/kg	2 mg/kg
		Historical Data		
1985	4	Radium-226	1.87 pCi/g	1.8 pCi/g
SWL-SS-09	0.5	Radium-226	2.26 pCi/g	1.8 pCi/g
CIS_SYSGEN_807	1.5	Radium-226	2.3 pCi/g	1.8 pCi/g
11036	5	Radium-226	113 pCi/g	1.8 pCi/g
SWL-SS-12	0.5	Radium-228	2.07 pCi/g	2.0 pCi/g
11041	2.5	Radium-228	2.14 pCi/g	2.0 pCi/g
1983	2.5	Radium-228	2.39 pCi/g	2.0 pCi/g
1988	5	Radium-228	2.56 pCi/g	2.0 pCi/g
SWL-SS-04	0.5	Radium-228	2.99 pCi/g	2.0 pCi/g
1718	3	Radium-228	3.15 pCi/g	2.0 pCi/g
Trench 1	7	Radium-228	3.74 pCi/g	2.0 pCi/g
11036	5	Radium-228	6.65 pCi/g	2.0 pCi/g
1988	5	Thorium-228	1.92 pCi/g	1.8 pCi/g
1720	3	Thorium-228	2.1 pCi/g	1.8 pCi/g
1720	10.5	Thorium-228	2.02 pCi/g	1.8 pCi/g
11041	2.5	Thorium-228	2.09 pCi/g	1.8 pCi/g
1718	3	Thorium-228	3.39 pCi/g	1.8 pCi/g
1718	10.5	Thorium-228	2.29 pCi/g	1.8 pCi/g
SWL-SS-04	0.5	Thorium-228	2.33 pCi/g	1.8 pCi/g
11041	15	Thorium-228	2.37 pCi/g	1.8 pCi/g
Trench 1	7	Thorium-228	2.55 pCi/g	1.8 pCi/g
1983	2.5	Thorium-228	2.69 pCi/g	1.8 pCi/g
11039	14	Thorium-228	2.98 pCi/g	1.8 pCi/g
1808	3	Thorium-228	4.01 pCi/g	1.8 pCi/g
11036	5	Thorium-228	9.36 pCi/g	1.8 pCi/g
11036	5	Thorium-230	720 pCi/g	280 pCi/g
1888	7.5	Thorium-232	1.58 pCi/g	1.5 pCi/g

TABLE 2-6
NON-URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-FRL Value	FRL Limit
CIS_SYSGEN_817	0.5	Thorium-232	1.7 pCi/g	1.5 pCi/g
11041	2.5	Thorium-232	1.75 pCi/g	1.5 pCi/g
CIS_SYSGEN_813	0.5	Thorium-232	1.8 pCi/g	1.5 pCi/g
1988	5	Thorium-232	1.957 pCi/g	1.5 pCi/g
CIS_SYSGEN_826	2	Thorium-232	2.0 pCi/g	1.5 pCi/g
1983	2.5	Thorium-232	2.07 pCi/g	1.5 pCi/g
CIS_SYSGEN_807	0.5	Thorium-232	2.2 pCi/g	1.5 pCi/g
1718	3	Thorium-232	2.22 pCi/g	1.5 pCi/g
SWL-SS-04	0.5	Thorium-232	2.5 pCi/g	1.5 pCi/g
Trench 1	7	Thorium-232	3.176 pCi/g	1.5 pCi/g
1808	3	Thorium-232	3.59 pCi/g	1.5 pCi/g
CIS_SYSGEN_807	1	Thorium-232	3.8 pCi/g	1.5 pCi/g
CIS_SYSGEN_807	1.5	Thorium-232	4.4 pCi/g	1.5 pCi/g
11041	15	Thorium-232	4.71 pCi/g	1.5 pCi/g
11039	14	Thorium-232	5.16 pCi/g	1.5 pCi/g
11036	5	Thorium-232	8.221 pCi/g	1.5 pCi/g
Trench 2	6	Total Thorium	3540 mg/kg	13.6 mg/kg**
1888	6	Arsenic	12.5 mg/kg	12 mg/kg
1721	15	Arsenic	13.8 mg/kg	12 mg/kg
1991	10	Arsenic	13.9 mg/kg	12 mg/kg
1720	10.5	Arsenic	15.4 mg/kg	12 mg/kg
1888	1.5	Beryllium	1.6 mg/kg	1.5 mg/kg
1888	6	Beryllium	1.6 mg/kg	1.5 mg/kg
1986	2.5	Beryllium	1.6 mg/kg	1.5 mg/kg
1983	2.5	Beryllium	1.7 mg/kg	1.5 mg/kg
1983	5	Beryllium	1.8 mg/kg	1.5 mg/kg
Trench 1	2	Aroclor-1254	170 µg/kg	130 µg/kg
11038	2.5	Aroclor-1260	170 µg/kg	130 µg/kg
1721	10.5	Aroclor-1260	610 µg/kg	130 µg/kg
11039	5	Benzo(a)anthracene	310,000 µg/kg	20,000 µg/kg
11041	2.5	Benzo(a)pyrene	13,000 µg/kg	2000 µg/kg
11039	5	Benzo(a)pyrene	260,000 µg/kg	2000 µg/kg
11039	5	Benzo(b)fluoranthene	220,000 µg/kg	20,000 µg/kg
11036	5	Carbazole	89,000 µg/kg	12,000 µg/kg
11039	5	Dibenzo(a,h)anthracene	79,000 µg/kg	2000 µg/kg
11041	2.5	Dibenzo(a,h)anthracene	3000 µg/kg	2000 µg/kg
1808	9	Heptachlorodibenzo-p-dioxins	990 ng/kg	800 ng/kg
11039	5	Indeno(1,2,3-cd)pyrene	150,000 µg/kg	20,000 µg/kg
1718	4.5	Octachlorodibenzo-p-dioxin	13,700 ng/kg	8800 ng/kg

µg/kg – micrograms per kilogram

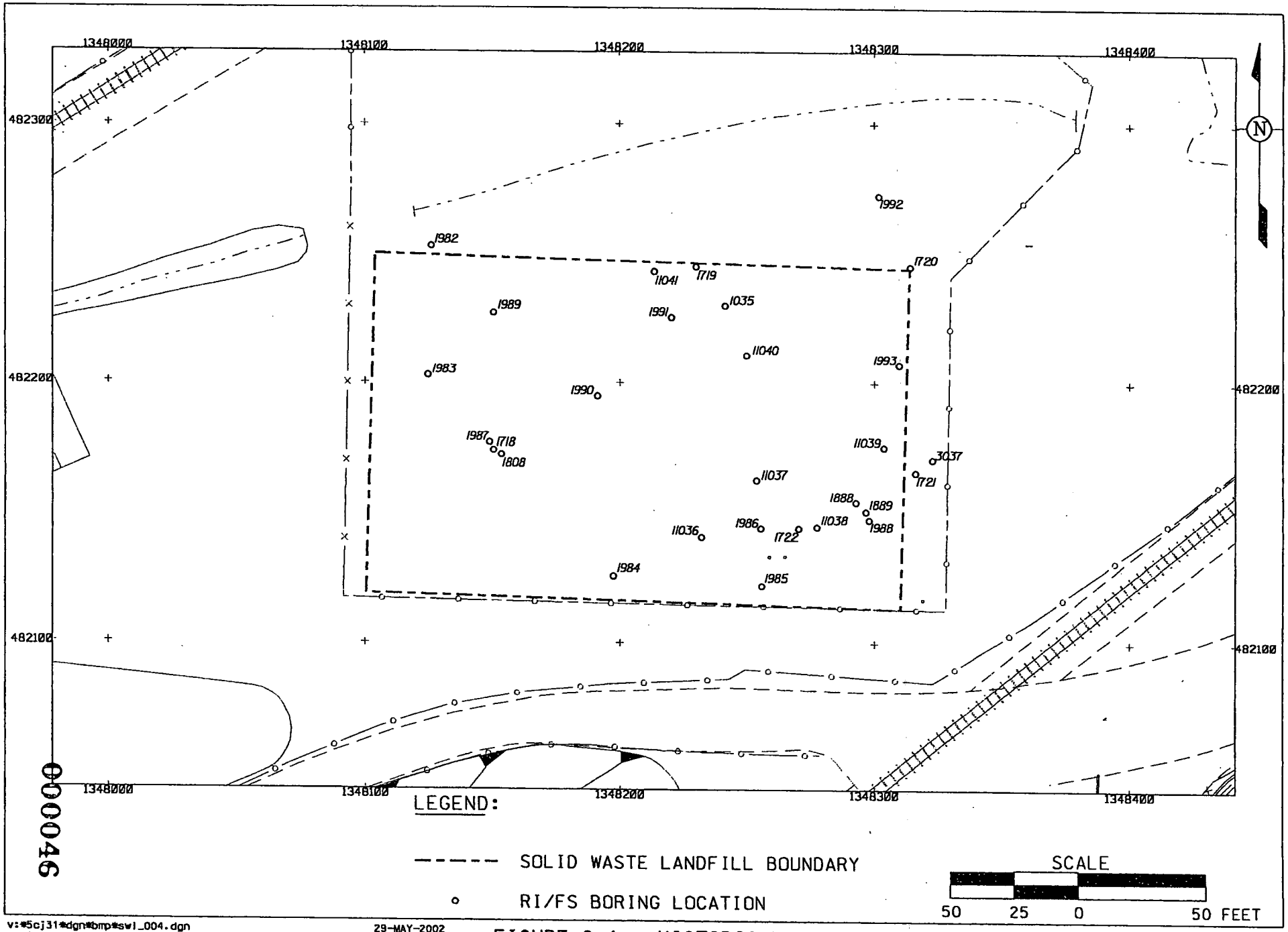
** The FRL for the thorium-232 concentration is in activity units. This value is the conversion of the FRL into mass concentration units based on thorium-232 being over 99 percent of all thorium by mass.

TABLE 2-7
SWL REVISED LIST OF ASCOCs

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Aroclor-1260
Thorium-228	Benzo(a)anthracene
Thorium-232	Benzo(a)pyrene
Total Uranium	Benzo(b)fluoranthene
	Arsenic
	Beryllium
	Carbazole
	Dibenzo(a,h)anthracene
	Fluoride
	Heptachlorodibenzo-p-dioxins
	Indeno(1,2,3-cd)pyrene
	Neptunium-237
	Octachlorodibenzo-p-dioxin
	Technetium-99

TABLE 2-8
NOMINAL SIZE AND VOLUME OF ABOVE-WAC AREA

Location	Contaminant	Size	Depth	Volume of Material
SWL	Total Uranium	5,100 ft^2	9 ft	1,700 yd^3



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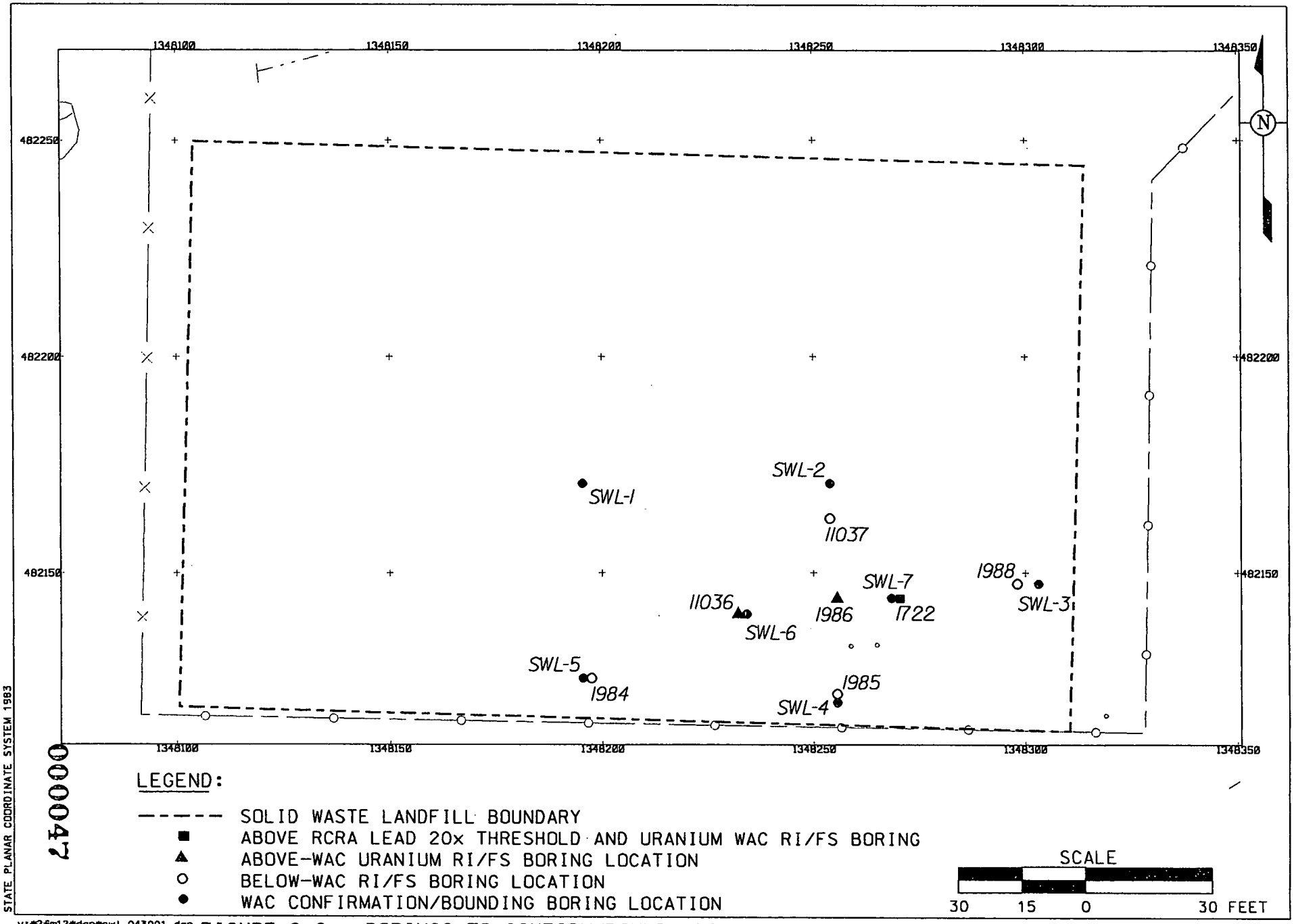
STATE PLANAR COORDINATE SYSTEM 1983

29-MAY-2002

FIGURE 2-1. HISTORICAL BORINGS IN SOLID WASTE LANDFILL AREA

000046

-4439



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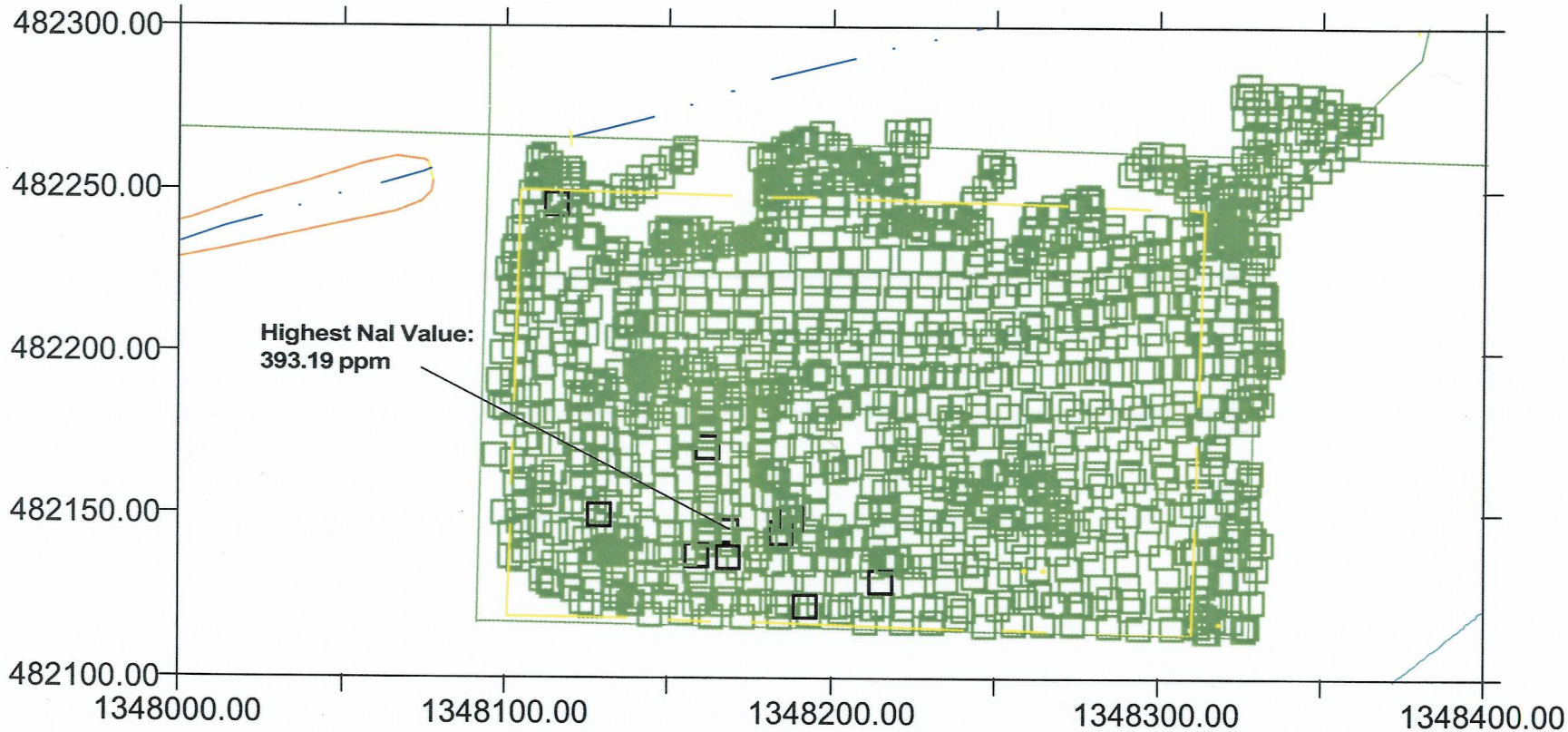
15-AUG-2002

FIGURE 2-2. BORINGS TO CONFIRM/BOUND ABOVE-WAC TOTAL URANIUM AREA

Figure 2-3
Area 6 Solid Waste Landfill, WAC Surface Scan

N

Moisture Corrected Total Uranium
Field of View to Scale
NaI Batch#: RSS2, 325
Measurement Date: 07/11/02



NaI
Total U (ppm)

- -174.26 to 246.00
- 246.00 to 721.00
- 721.00 to 9999.00

RTIMP DWG Title: A6_SWL_SF_TU.srf
Project Name: PreDesign in the Solid Waste Landfill
Project #: 20600-PSP-0002
Prepared By: B. McDaniel/11058
Date Prepared: 07/11/02
Support Data: 0325rss2.xls

000048

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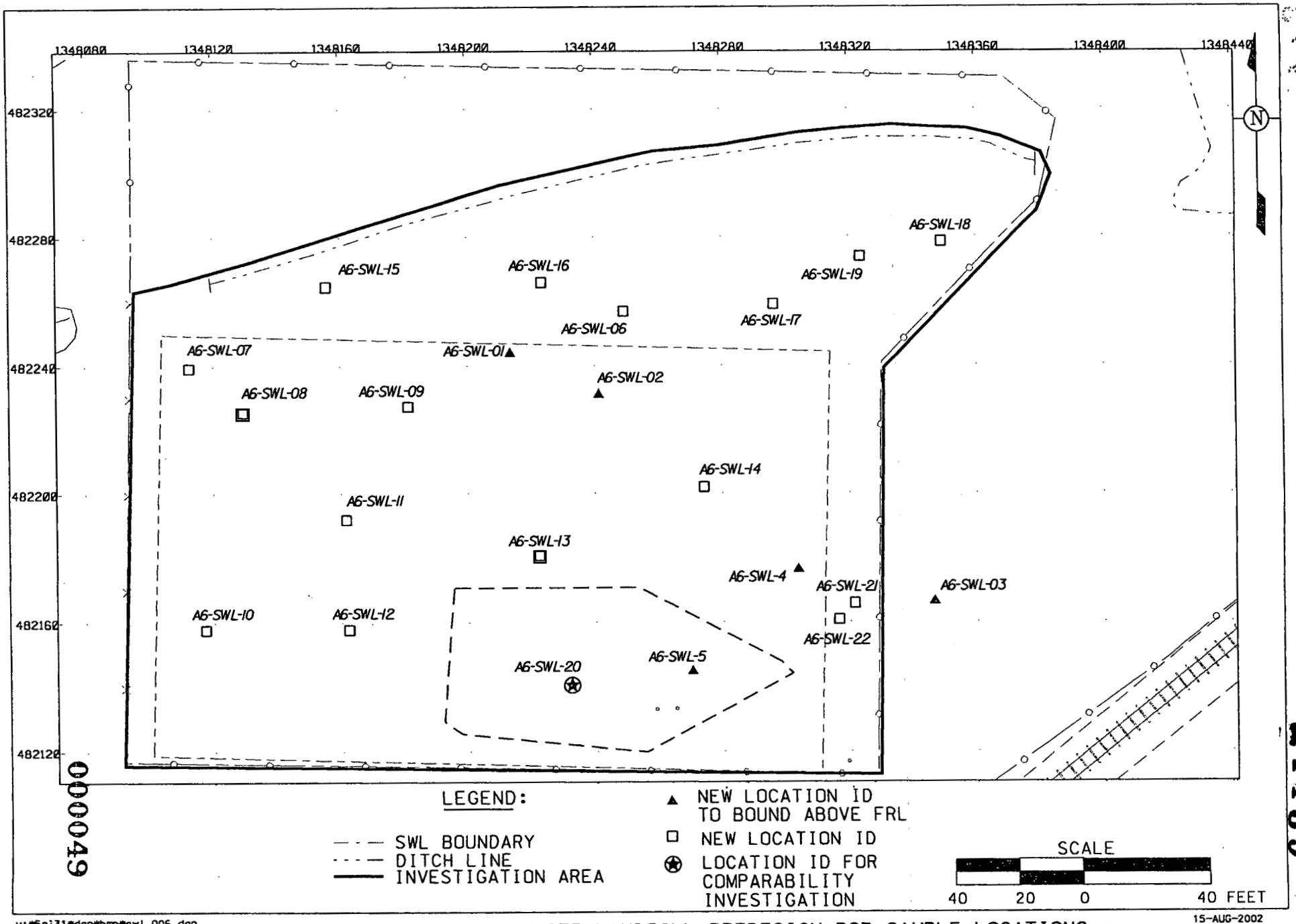

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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-4. SOLID WASTE LANDFILL PREDESIGN PSP SAMPLE LOCATIONS

15-AUG-2002

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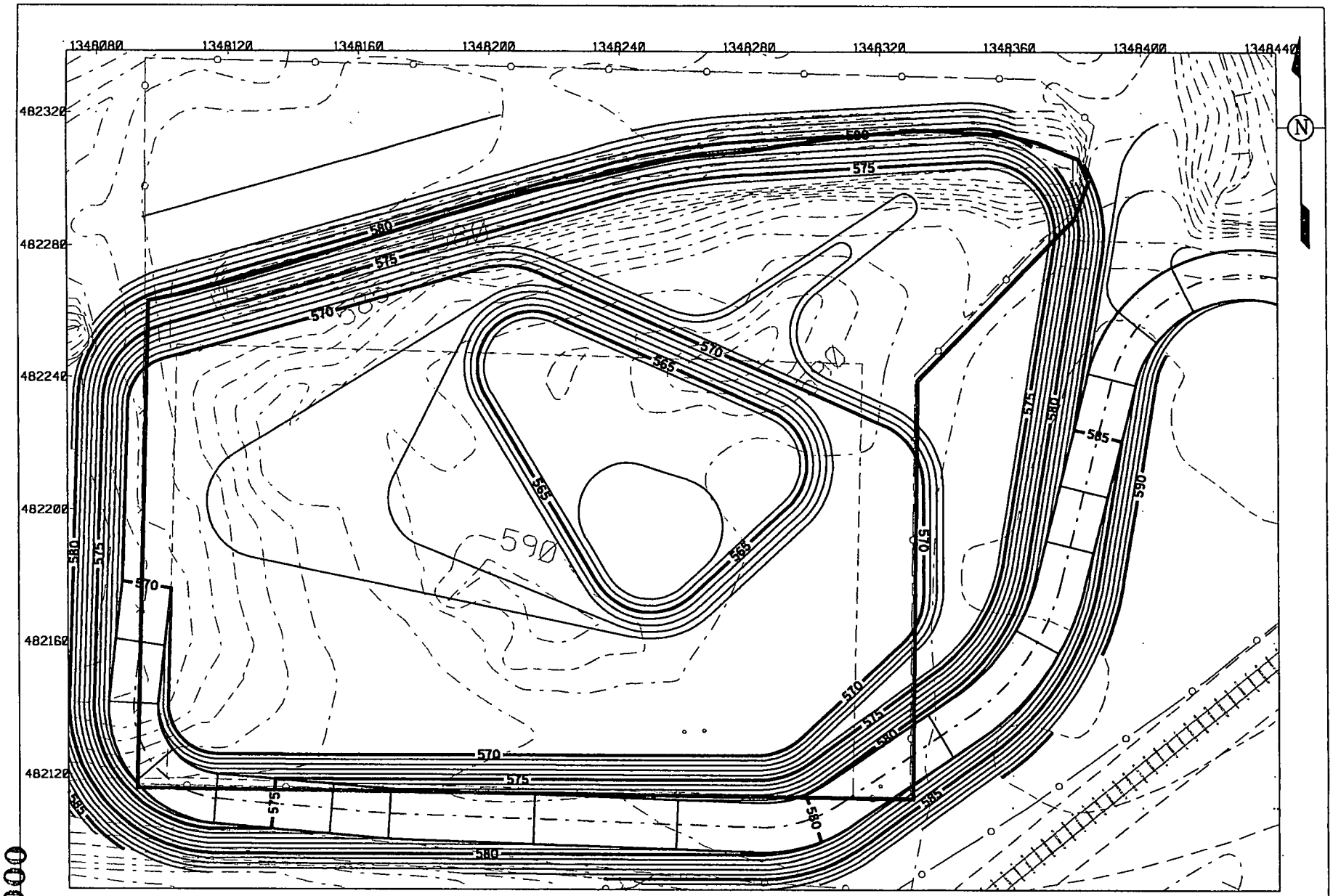


FIGURE 2-5. SOLID WASTE L[illegible]FILL ABOVE-ERL EXCAVATION DESIGN DEPTHS

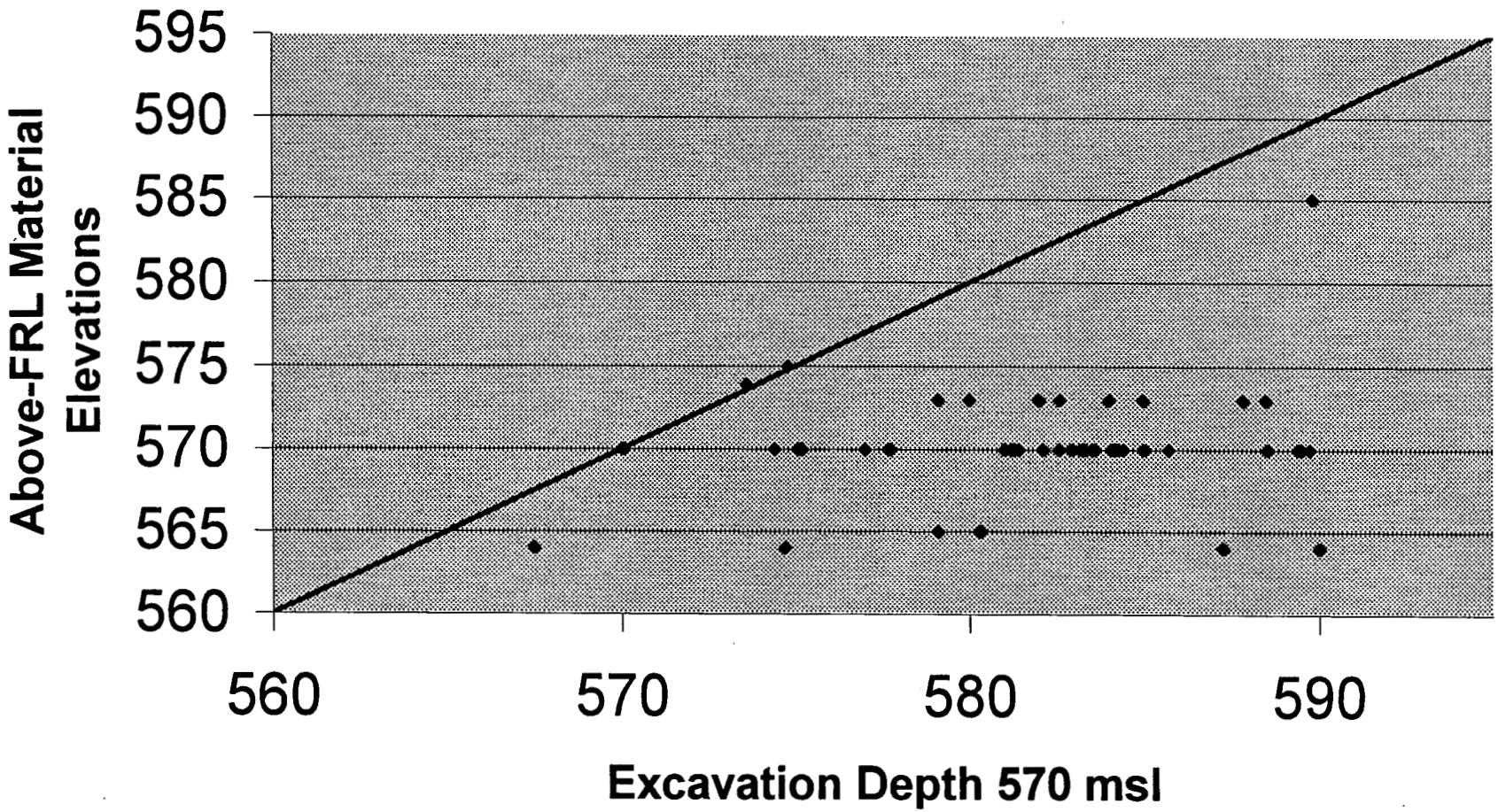
v:\5oj31[illegible]mp\swl_010.dgn
STATE P[illegible] COORDINATE SYSTEM 1983

15-[illegible]2

000050

-4439

Figure 2-6
Excavation Depth Comparison



3.0 PREDESIGN INVESTIGATIONS AND CHARACTERIZATION DATA FOR THE FIRE TRAINING FACILITY

3.1 SUMMARY OF THE RI/FS INVESTIGATION

Extensive soil sampling was performed at the FEMP in the late 1980s and early 1990s as part of the RI/FS to characterize the nature and extent of contamination resulting from decades of uranium-metal production. Figure 3-1 shows RI/FS soil boring locations in the FTF. Most locations shown on the figure represent multiple samples collected at depths ranging from 0.5 to 26 feet below the surface (i.e., each boring location was used to collect multiple samples).

3.1.1 Preliminary Constituents of Concern

Based on results of the RI/FS investigation, the SEP presented a preliminary list of ASCOCs for Remediation Area 6 (Table 3-1) and stated that a more thorough screening of ASCOCs would be performed for each remediation area during the design phase. Section 3.5 discusses the additional COC screening for the FTF.

3.1.2 OSDF Waste Acceptance Criteria

The OSDF WAC were established in the OU2 and OU5 RODs (Table 3-2). Soil excavated from the FTF must meet these concentration-based WAC to be eligible for disposal in the OSDF. If soil exceeds the OSDF radiological WAC, it will have to be segregated for off-site disposal. For the special case of soil with above-WAC organic or metal COCs, disposal at the OSDF is permitted if the soil is treated to bring the COC levels below the established WAC. The RI/FS data were used to identify areas that exceed the OSDF WAC and to determine the areas that require additional data to delineate the extent of the above-WAC contamination. Section 3.3.2.2 discusses the sampling performed to further delineate the above-WAC contamination.

3.1.3 Final Remediation Levels for Soil

Like the OSDF WAC, the OU5 ROD established the FRLs for soil remediation (Table 3-3). FRLs are the cleanup goals for the FEMP and are defined as the average concentration of a constituent that can remain in the soil and be considered protective of human health and the environment. Remediation in the FTF will remove contaminated soil until the residual concentration of constituents is at or below the FRL. The FRL for total uranium is 82 mg/kg. However, there is a goal of meeting 50 mg/kg for total uranium (outside of the high-leachability areas) that is driven by the ALARA philosophy. The ALARA

goal of 50 mg/kg will be reached if soil exceeding 50 mg/kg is within one lift thickness (i.e., 3 feet ±1 foot) of soil exceeding the uranium FRL of 82 mg/kg.

RI/FS data were searched to identify all areas containing above-FRL concentrations for the preliminary COCs in the FTF (Table 3-1). The search results were used to establish the areas where additional data were needed to delineate the extent of above-FRL contamination. Section 3.3 discusses the sampling performed to further delineate the above-FRL contamination.

3.1.4 Hazardous Waste Management Units

A HWMU is defined as a contiguous area of land in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. There are 14 HWMUs at the FEMP that will be closed during site excavation under the RCRA/CERCLA integrated remedial response. The FTF was designated HWMU No. 1 because hazardous materials were utilized at the FTF. COCs for the HWMU are 1,1,1-trichloroethane and toluene. These constituents are not listed as COCs for Remediation Area 6 but have been included in the predesign investigation to ensure that all HWMU constituents have been identified for removal. Section 3.3.2.4 provides additional information on this HWMU.

The FTF was also identified as requiring a removal action subject to the regulations associated with CERCLA. RA28 was initiated in July 1994 and concluded in April 1995. The removal action included removing each structure in the FTF, excavating each area of contamination in the FTF, collecting pre- and post-excavation samples of each area, and back-filling each area. Back-fill soil came from stockpiles from RA17. Four stockpiles from the RA still remain at the FTF.

3.1.5 Underground Storage Tanks

There are no USTs located in the FTF area.

3.1.6 Identification of Potentially Characteristic Areas

Based on historical process knowledge and soil contaminant concentration levels identified through the OU5 RI/FS investigation, six geographic areas of the FEMP have reasonable potential for containing RCRA characteristic waste that provides an opportunity for treatment. None of these six potentially characteristic areas are located in the FTF boundary.

3.2 SUMMARY OF SURFACE AND SUBSURFACE PHYSICAL CONDITIONS

The FTF is located in Area 6 along the northern fence-line of the Former Production Area (FPA), just north of the rail yard. The FTF was constructed in 1966 as a training facility for the FEMP Fire Department and the surrounding community fire departments. It operated from 1966 to 1990 and contained a block building, skid tank, open top tank, horizontal pressure vessel, metal burn areas, and a former drum storage area. The flammable and combustible substances used to start the fires at the FTF were determined to have contained hazardous and radiological materials. As a result, the FTF site and components became contaminated with hazardous materials, low level radioactive materials, and low levels of PCBs.

The FTF building was demolished in 1995 and the surrounding area was excavated under RA28. The RA28 excavation took place before FRL values were established, which occurred in 1996, after the RI/FS was completed. Therefore, only highly and visibly contaminated soils were removed during the RA28 excavation. A review of the historical data (from both before and after RA28) indicates that above-FRL levels for the COCs exist in the soil. In addition, there were above-WAC levels for total uranium at one sample location in the east field area of the FTF. Most of these concentrations exist at a depth of 0 to 0.5 feet and 2.0 to 2.5 feet, but the RA28 excavation did not exceed 6 inches in most of the area. Therefore, COCs at the above-FRL and WAC concentrations may still be present in the soil.

A review of verification data obtained after RA28 indicated that there are still above-FRL concentrations present for the following COCs: aroclor-1260, aroclor-1254, total uranium, arsenic, beryllium, tetrachloroethene, and thorium-232. One above-FRL result for radium-226 was obtained from an area south of the asphalt pad, near the magnesium burn area. Figure 3-2 identifies these locations.

3.3 SUMMARY OF PREDESIGN INVESTIGATIONS

Two predesign investigations have been completed to supplement RI/FS information on the nature and extent of contamination in the FTF. The specific goals included filling data gaps, confirming questionable analytical results, bounding above-WAC or above-FRL areas, investigating potentially characteristic areas, and confirming the location of surface above-WAC areas through real-time scanning. The following predesign investigations were completed to meet these goals:

- *PSP for Sampling of Miscellaneous Areas for OSDF WAC Attainment*

  Sampling under this PSP was performed to bound known above-WAC conditions in the FTF based on RI/FS and RA28 data sets, which indicated that there was an above-WAC location of 4-nitroanaline.

- *PSP for Predesign Sampling in the SWL and FTF*

  Sampling under this PSP was performed to bound known above-FRL and above-WAC conditions in the FTF based on RI/FS and RA28 data sets. Several new locations were identified as above WAC or potentially characteristic and were delineated as well.

Sections 3.3.1 and 3.3.2 summarize and discuss the sampling and analysis performed under each of these investigations. Appendix D includes analytical results from the predesign investigations.

3.3.1 Real Time Scanning

The RTRAK is utilized for larger flat areas that are readily accessible. The RSS is utilized for smaller areas, gradual slopes, or areas not accessible by the RTRAK. The HPGe detector is utilized for areas that are inaccessible to both the RTRAK and the RSS. A walkdown of the area by Characterization and/or RTIMP representatives may be required to determine the appropriate type of *in situ* gamma spectroscopy equipment needed. The decision to use any of these evaluation techniques will be made by the Characterization Manager and RTIMP Field Manager or their designees.

Real-time scanning was performed on all accessible soil in the FTF. Figures 3-3 through 3-9 show RTRAK and RSS traverses as patterns composed of small squares and HPGe shots as circles. The scanning was completed under the PSP for Predesign Sampling in the SWL and FTF.

Based on the real-time scanning, results above-FRL levels were identified for radium-226, thorium-232, and total uranium in the center and southeast corner of the FTF east field area. Although above-WAC concentrations of uranium were identified in the southeastern corner area during previous sampling events, real-time scanning could not confirm this. These particular areas were re-sampled under the predesign PSP.

3.3.2 Physical Sampling

The Predesign PSP sampling strategy involved establishing borings to identify and bound any known or additional above-WAC locations within the FTF as well as to bound the known or additional above-FRL

conditions. Most of the borings were advanced to 4 or 6 feet below grade to bound the depth of the above-FRL values. In the area of the skid tank and pond, borings were advanced as far as 14 feet below grade. It was the intent of the sampling strategy of the Predesign PSP to bound non-total uranium/thorium contamination that was above FRL that would drive remediation beyond the extent of total uranium/thorium contamination. Figure 3-10 shows the locations of all predesign sampling that were conducted under the PSP for Predesign Sampling in the SWL and FTF.

3.3.2.1 Potentially Characteristic Areas

A review of the historical data collected during verification sampling following RA28 revealed elevated levels of tetrachloroethene (PCE) at sample point RA28-SP-3 (SP-3) (86 mg/kg) which exceeded the 20 times rule for comparison to the TCLP limit. SP-3 falls within the area of the skid tank pond that was excavated to a depth of 5 feet below grade. Re-sampling and analysis of soil for PCE by the TCLP method at that location (A6-FTF-53) was conducted during predesign sampling. Results of this analysis [0.508 milligrams per Liter (mg/L)] indicated that levels of tetrachloroethene are below the TCLP limit and meet OSDF WAC.

3.3.2.2 Above OSDF WAC Areas

A review of the historical data set identified total uranium present at the surface at above-WAC levels (1,044 ppm) at one RI/FS sample location (Zone 3-456) in the southeast corner of the east field of the FTF. This sample was investigated with five borings surrounding it. Borings A6-FTF-13 through A6-FTF-17 bound the above-WAC condition at the RI/FS location. Boring A6-FTF-15 was located directly at the Zone 3-456 location and did not confirm the above-WAC condition, however, the area is still considered to be above WAC and will be excluded from placement in the OSDF (Figure 3-10).

During sampling of location A6-FTF-55 at a depth of 2 feet the samplers obtained an elevated frisker reading and subsequently submitted a biased sample at the respective interval for the analysis of total uranium and technetium-99. The results of this analysis demonstrated that uranium was not above WAC but technetium-99 (210 pCi/g) was above WAC. This boring was designed to collect samples at the 1-foot and the 3-foot interval, both of which are below WAC for technetium-99. The planned borings of A6-FTF-54, A6-FTF-56, and A6-FTF-58 also demonstrated below-WAC values of technetium-99 at the 1-foot and 3-foot intervals, bounding the above WAC to the north, northeast, and east. Boring A6-FTF-59, southwest of the above-WAC location, originally was not sampled for technetium-99 at the

1-foot and 3-foot interval. A variance was written to add technetium-99 analysis at this boring at the 1-foot, 2-foot, and 3-foot intervals. The results bound the above-WAC material to the southwest. No other result for tecnetium-99 in the FTF area was above the OSDF WAC (Figure 3-10).

During sampling of location A6-FTF-52 at a depth of 11 feet the samplers obtained an elevated photoionization detector (PID) reading and subsequently submitted a biased sample at the respective interval for the analysis of volatile organic compounds. The results of this analysis (271 mg/kg) indicated that PCE was above the OSDF WAC of 128 mg/kg. Additional sampling was performed at this location and bound the above-WAC vertically at 12 feet. Locations were established surrounding this interval and sampled to laterally bound this above-WAC area. Borings A6-FTF-53 and A6-FTF-49 bound PCE to the north and south respectively. Borings A6-FTF-51 and A6-FTF-69 bound the above-WAC PCE to the west and east respectively. This area is similar in nature to the above-WAC conditions exhibited at the incinerator pad in Area 3A (Figure 3-10).

An above-WAC data summary is provided in Table 3-4.

3.3.2.3 Location of HWMU

As stated in Section 3.1.4, the FTF is a HWMU. The HWMU is divided into two areas (separated by the old North Access Road). The smaller, western portion encompasses the asphalt pad and building. The eastern portion is located within the old North Access Road, the gravel construction road and the southern and eastern fences.

The biased sampling conducted to investigate the above-WAC PCE at location A6-FTF-52 and the subsequent PCE bounding locations of A6-FTF-49, A6-FTF-51, A6-FTF-53, and A6-FTF-69 revealed elevated levels of 1,1,1-trichloroethane. 1,1,1-trichloroethane and toluene are the COCs for this HWMU. Toluene has not been detected above the its FRL. Although 1,1,1-trichloroethane does not have an associated FRL, 1,1,2-trichloroethane does have an FRL of 4.3 mg/kg. The 1,1,2-trichloroethane FRL was used as the basis of evaluation to determine whether or not 1,1,1-trichloroethane was elevated. The levels of 1,1,1-trichloroethane ranged from 16.2 mg/kg to 110 mg/kg and were located between the 11-foot depth and the 12-foot depth. This 1,1,1-trichloroethane is co-located with the above-WAC PCE and has been bound to the north and south with borings A6-FTF-53 and A6-FTF-49, respectively and to the west and east with borings A6-FTF-70 and A6-FTF-71, respectively. It has been bound at depth with

all of these borings. The removal of all of the elevated 1,1,1-trichloroethane will be accomplished with the removal of the above-WAC PCE by extending the above-WAC PCE zone to encompass the elevated 1,1,1-trichloroethane.

3.3.2.4 Above FRL

Historical data indicated above-FRL concentrations of aroclor-1260, aroclor-1254, arsenic, beryllium, radium-226, radium-228, tetrachloroethene, thorium-228, thorium-232, total thorium, and total uranium throughout the entire FTF area. The above-FRL results are summarized in Tables 3-5 and 3-6 and are depicted in Figure 3-11. The Predesign PSP focused on the primary radiological constituents of concern (uranium, radium-226, radium-228, thorium-228 and thorium-232) as these were the constituents that were the deepest in most of the area. It also included total thorium. The borings were strategically placed in a manner that would support the planned excavation design in the FTF. Borings were advanced to below the anticipated excavation depth and samples collected at intervals to determine where below-FRL soil was encountered.

In an attempt to bound the above-WAC total uranium at Zone 3-456, location A6-FTF-17 south of the original location was identified as being above FRL at the 1-foot interval with a result of 83.4 mg/kg. An additional location, A6-FTF-68, was added further south 10 feet and bound both aforementioned locations (Figures 3-10 and 3-11).

A6-FTF-23 had an aroclor-1260 result of 0.52 mg/kg, which is above FRL (Figure 3-11). This location is bound by A6-FTF-5, A6-FTF-47, A6-FTF-59, and A6-FTF-22. It is not currently bound at depth but it will be further investigated during excavation control/precertification by taking physical samples to confirm that the contamination has been removed (see Section 4.3).

A6-FTF-19 had an aroclor-1260 result of 0.19 mg/kg, which is above its FRL of 0.13 mg/kg, at the 3-foot interval (Figure 3-11). This location is bound at depth (6 feet) and is also bound by A6-FTF-18 and 19. At this time it will not be bound to the southeast because the excavation boundaries extend well beyond this location. This location will be further investigated during excavation control/precertification by taking physical samples to confirm that the contamination has been removed (see Section 4-3).

A6-FTF-47 had an arsenic result of 20 mg/kg, which is above its FRL of 12 mg/kg, at the 4-foot depth interval (Figure 3-11). This location is bound to by A6-FTF-35, A6-FTF-42, and A6-FTF-23. It is not bound at depth but this boring location will be further investigated during excavation control/precertification by taking physical samples to confirm that the contamination has been removed (see Section 4.3).

As stated in Section 3.3.2.2, biased sampling was conducted to investigate the above-WAC PCE at location A6-FTF-52. The above-WAC PCE was bound at locations A6-FTF-49, A6-FTF-51, A6-FTF-53, and A6-FTF-69. But there were still above-FRL results at A6-FTF-51 and A6-FTF-69 for PCE and elevated results for 1,1,1-trichloroethane, which does not have an FRL so the FRL for 1,1,2-trichloroethane (4.3 mg/kg) was used as the basis for evaluation to determine whether or not 1,1,1-trichlorethane was elevated. Additional samples, A6-FTF-70 and A6-FTF-71, were taken to bound the above-FRL results 5 feet west of A6-FTF-51 and 5 feet east of A6-FTF-69 (Figure 3-11). Both PCE and 1,1,1-trichloroethane were bound at depth and to the north and south with borings A6-FTF-53 and A6-FTF-49, respectively and at depth and to the west and east with borings A6-FTF-70 and A6-FTF-71, respectively. The above-WAC PCE zone will be extended to encompass the elevated 1,1,1-trichloroethane and above-FRL PCE.

All other RI/FS locations that were above-FRL have been bound with the predesign sampling.

3.3.2.5 Extent of Contamination

The predesign PSP was designed to encompass all of the above-FRL material in one pocket, thus minimizing the effort to bound each location separately and creating one pocket for excavation of above-FRL material instead of many. This PSP also targeted bounding the above-WAC total uranium using a 5-point pattern to minimize the amount of soil that would not be able to go to the OSDF. The outer boundaries of the sampling strategy for the above-FRL material in the FTF are described below (Figure 3-11).

The boundary starts at the northwest corner and goes south until it is south of the Former Asphalt Pad and north of the piles, then it moves east until it is southwest of the Former Skid Tank and east of the asphalt roadway. The boundary then turns south again and continues to the fence line and at the fence line it turns east and continues to the eastern fence line. The boundary then turns north and goes to just

above the Former Open Top Tank location and then turns west again. It runs northwest above the Former Skid Pond and up the east side of the Former Asphalt Pad. Finally, it turns west above the northern boundary of the Former Asphalt Pad and continues west until it connects in the northwest corner. The north field of the FTF has been excluded from the boundary because the 10 boring locations in this field demonstrate no above-FRL contamination, therefore this area will not require excavation.

The sample results obtained under the OSDF Miscellaneous Areas and Predesign PSPs indicated that all above-FRL contamination would be removed from the FTF during excavation.

3.4 HIGH-LEACHABILITY ZONES

The FTF is not considered a high-leachability area. The FRLs for this portion of the FEMP were established in the OU3 ROD.

3.5 IDENTIFICATION OF AREA-SPECIFIC CONSTITUENTS OF CONCERN

Table 3-1 shows the preliminary list of COCs for Area 6 that was based on the results of sampling and analysis performed during the RI/FS investigation. Based on the results of predesign sampling and analysis, Table 3-7 presents the revised list of COCs that will be used for the FTF. In addition, HWMU COCs toluene and 1,1,1-trichloroethane were added for confirmation purposes. The list of primary COCs has remained the same because these are sitewide COCs. 1,2-dichloroethene and trichloroethene were added as secondary COCs. The COCs were chosen based the following criteria:

- The constituent is widespread in the FTF and is commonly found at above-FRL concentrations (i.e., the primary COCs)
- The constituent is present at above-FRL concentrations at depths that drive the design excavation contours in those areas
- The constituent is identified as a HWMU COC.

3.6 EXCAVATION BOUNDARIES

Excavation boundaries for the FTF are established based on the following information:

- Above-WAC and above-FRL areas which are manually established based on real-time scanning results and bounding physical sampling results
- Location of building foundations, support structures, and utilities

- Constructability and safe-slope configurations necessary to effectively excavate the material.

All of this information is combined to form a complete picture of the volume of material that should be excavated from the SWL and FTF. Section 4.0 provides excavation volumes for soil and debris. Table 3-8 summarizes the soil volumes associated with the excavation drivers (i.e., above WAC, above FRL). To verify that above-FRL soil has been captured by the excavation profiles shown on Figure 3-12, the depth of each above-FRL sample result was compared to the design excavation depth at the same location. If the sample depth was deeper than the excavation depth, the excavation contours were adjusted to capture the additional above-FRL material. The results of these comparisons have been graphically represented for all COCs (Figure 3-12). When reading these graphs, note that depths are plotted relative to msl (i.e., 580 is deeper than 590), and the diagonal line corresponds to a slope of 1:1 to represent the case where the excavation and sample depth are equal. Above-FRL sample points that fall below the line are captured by the designed excavation (i.e., the sample depth is shallower than the excavation depth at that location). Above-FRL sample points that fall above the line are not captured by the designed excavation (i.e., the sample depth is deeper than the excavation depth at that location).

TABLE 3-1
PRELIMINARY AREA-SPECIFIC CONSTITUENTS OF CONCERN

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Aroclor-1260
Thorium-228	Arsenic
Thorium-232	Benzo(a)pyrene
Total Uranium	Benzo(b)fluoranthene
	Beryllium
	Bromodichloromethane[a]
	Cesium-137
	Dibenzo(a,h)anthracene
	1,1-Dichloroethene
	Dieldrin
	Fluoride
	Heptachlorodibenzo-p-dioxins
	Indeno(1,2,3-cd)pyrene
	Octachlorodibenzo-p-dioxin
	Technetium-99
	Tetrachloroethene
	Thorium-230
	Ecological COCs
	Silver
	Antimony
	Cadmium
	PAHs[b]

a Not detected above the FRL in the remediation area, but the non-detect value is greater than the FRL

b Polyaromatic hydrocarbons (PAHs) include benco(a)anthracene, benco(B)fluoranthene, benco(G,H)perlene, benco(K)fluoranthene, fluoranthene, chrysene, dibenco(A,H)anthracene, Indeno(1,2,3-Co)pyrene, phenantrene, pyrene

TABLE 3-2
OSDF WASTE ACCEPTANCE CRITERIA

WAC Constituent	Maximum Concentration
Neptunium-237	3.12×10^{9} pCi/g
Strontium-90	5.67×10^{10} pCi/g
Technetium-99	29.1 pCi/g
Total Uranium	1030 mg/kg
Alpha-chlordane	2.89 mg/kg
Bis(2-chloroisopropyl)ether	2.44×10^{-2} mg/kg
Bromodichloromethane	9.03×10^{-1} mg/kg
Carbazole	7.27×10^{4} mg/kg
Chloroethane	3.92×10^{5} mg/kg
1,1-Dichloroethene	11.4 mg/kg
1,2-Dichloroethene	11.4 mg/kg
4-Nitroaniline	4.42×10^{-2} mg/kg
Tetrachloroethene	128 mg/kg
Toxaphene	1.06×10^{5} mg/kg
Trichloroethene	128 mg/kg
Vinyl chloride	1.51 mg/kg
Boron	1.04×10^{3} mg/kg
Mercury	5.66×10^{4} mg/kg

TABLE 3-3
SOIL FINAL REMEDIATION LEVELS

Constituent	Final Remediation Level
Radionuclides	
Cesium-137	1.4 pCi/g
Plutonium-238	78 pCi/g
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Strontium-90	14 pCi/g
Technetium-99	30 pCi/g
Thorium-228	1.7 pCi/g
Thorium-230	280 pCi/g
Thorium-232	1.5 pCi/g
Uranium, Total (outside a high-leachability area)	82 mg/kg
Uranium, Total (inside a high-leachability area)	20 mg/kg
Inorganics	
Arsenic	12 mg/kg
Beryllium	1.5 mg/kg
Fluoride	78,000 mg/kg
Lead	400 mg/kg
Organics	
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzo(a)anthracene	20 mg/kg
Benzo(a)pyrene	2 mg/kg
Benzo(b)fluoranthene	20 mg/kg
Bromodichloromethane	4 mg/kg
Dibenzo(a,h)anthracene	2 mg/kg
1,1-Dichloroethene	0.41 mg/kg
Dieldrin	0.015 mg/kg
Indeno(1,2,3-cd)pyrene	20 mg/kg
Tetrachloroethene	3.6 mg/kg
Trichloroethene	25 mg/kg

TABLE 3-4
ABOVE-WAC DATA SUMMARY

Boring ID	Depth (feet)	Analyte	Above-WAC Value	WAC Limit
A6-FTF-52	9	Tetrachloroethene	187mg/kg	128 mg/kg
A6-FTF-52	10	Tetrachloroethene	252 mg/kg	128 mg/kg
A6-FTF-52	11	Tetrachloroethene	271 mg/kg	128 mg/kg
A6-FTF-55	2	Technetium-99	210 pCi/g	29.1 pCi/g
Zone 3-435	0.166	Total Uranium	1,044 mg/kg	1,030 mg/kg

TABLE 3-5
NON-URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Parameter	Above-FRL Value	FRL Limit
		Current Data		
A6-FTF-19	3	Aroclor-1260	0.19 mg/kg	0.130 mg/kg
A6-FTF-23	1	Aroclor-1260	0.52 mg/kg	0.130 mg/kg
A6-FTF-69	11	1,1-Dichloroethene	0.61 mg/kg	0.410 mg/kg
A6-FTF-52	10	1,1-Dichloroethene	0.87 mg/kg	0.410 mg/kg
A6-FTF-52	9	1,1-Dichloroethene	1.5 mg/kg	0.410 mg/kg
A6-FTF-69	11	Tetrachloroethene	6 mg/kg	3.600 mg/kg
A6-FTF-52	11	1,1-Dichloroethene	6.7 mg/kg	0.410 mg/kg
A6-FTF-69	11	1,1,1 Trichloroethane	16.2 mg/kg	4.300 mg/kg **
A6-FTF-47	4	Arsenic	20 mg/kg	12.000 mg/kg
A6-FTF-51	11	1,1,1 Trichloroethane	20.6 mg/kg	4.300 mg/kg **
A6-FTF-51	12	1,1,1 Trichloroethane	25.7 mg/kg	4.300 mg/kg **
A6-FTF-52	11	Tetrachloroethene	35.8 mg/kg	3.600 mg/kg
A6-FTF-51	12	Tetrachloroethene	36.9 mg/kg	3.600 mg/kg
A6-FTF-51	11	Tetrachloroethene	49.6 mg/kg	3.600 mg/kg
A6-FTF-52	9	Tetrachloroethene	85.7 mg/kg	3.600 mg/kg
A6-FTF-52	10	1,1,1 Trichloroethane	110 mg/kg	4.300 mg/kg **
A6-FTF-52	10	Tetrachloroethene	252 mg/kg	3.600 mg/kg
		Historical Data		
044703-013	0.5 *	Beryllium	1.6 mg/kg	1.5 mg/kg
044703-020	0.5 *	Beryllium	1.6 mg/kg	1.5 mg/kg
044703-018	0.5 *	Beryllium	1.9 mg/kg	1.5 mg/kg
ZONE 3-435	0.5	Radium-228	2 pCi/g	1.8 pCi/g
ZONE 3-435	0.3333333	Thorium-228	2.4 pCi/g	1.7 pCi/g
ZONE 3-435	0.1666667	Thorium-232	5.2 pCi/g	1.5 pCi/g
ZONE 3-435	0.1666667	Radium-228	5.8 pCi/g	1.8 pCi/g
ZONE 3-435	0.1666667	Thorium-228	6.2 pCi/g	1.7 pCi/g
RA28-SP-2	5 *	Arsenic	12.5 mg/kg	12 mg/kg
RA28-SP-8	5 *	Arsenic	13.3 mg/kg	12 mg/kg
1508	3.5	Thorium, Total	14 mg/kg	13.6 mg/kg
1509	10.5	Thorium, Total	16 mg/kg	13.6 mg/kg
1511	10.5	Thorium, Total	17 mg/kg	13.6 mg/kg
11229	0.5 *	Thorium, Total	18.9 ug/g	13.6 ug/g
044703-009	0.5 *	Radium-226	23 pCi/g	1.7 pCi/g
1511	3	Thorium, Total	48 mg/kg	13.6 mg/kg
1511	6.5	Thorium, Total	78 mg/kg	13.6 mg/kg
1511	0.5	Thorium, Total	82 mg/kg	13.6 mg/kg
1512	3	Thorium, Total	136 mg/kg	13.6 mg/kg

TABLE 3-5
NON-URANIUM ABOVE-FRL DATA SUMMARY
(Continued)

Boring ID	Depth (feet)	Parameter	Above-FRL Value	FRL Limit
RA28-SP-6	5 *	Aroclor-1254	140 ug/kg	130 ug/kg
044703-049	0.5 *	Aroclor-1260	140 ug/kg	130 ug/kg
RA28-SP-1	5 *	Aroclor-1260	140 ug/kg	130 ug/kg
044703-012	0.5 *	Aroclor-1260	220 ug/kg	130 ug/kg
044703-019	0.5 *	Aroclor-1260	220 ug/kg	130 ug/kg
044703-019	0.5 *	Aroclor-1260	220 ug/kg	130 ug/kg
1508	2.5	Aroclor-1260	240 ug/kg	130 ug/kg
044703-015	0.5 *	Aroclor-1260	260 ug/kg	130 ug/kg
RA28-LINE-1	6 *	Aroclor-1260	260 ug/kg	130 ug/kg
RA28-SP-3	5 *	Aroclor-1260	340 ug/kg	130 ug/kg
044703-026	0.5 *	Aroclor-1260	560 ug/kg	130 ug/kg
RA28-SP-8	5 *	Aroclor-1260	610 ug/kg	130 ug/kg
044703-050	0.5 *	Aroclor-1260	630 ug/kg	130 ug/kg
RA28-LINE-2	6 *	Aroclor-1260	740 ug/kg	130 ug/kg
044703-048	0.5 *	Aroclor-1260	800 ug/kg	130 ug/kg
044703-013	0.5 *	Aroclor-1260	810 ug/kg	130 ug/kg
RA28-LINE-2	6 *	Aroclor-1260	1000 ug/kg	130 ug/kg
044703-014	0.5 *	Aroclor-1260	1100 ug/kg	130 ug/kg
FT-5	0.5	Aroclor-1260	1300 ug/kg	130 ug/kg
044703-025	0.5 *	Aroclor-1260	1700 ug/kg	130 ug/kg
FT-5	2.58	Aroclor-1260	1700 ug/kg	130 ug/kg
RA28-SP-5	5 *	Aroclor-1260	1900 ug/kg	130 ug/kg
RA28-LINE-3	6 *	Aroclor-1260	2000 ug/kg	130 ug/kg
1512	2.5	Aroclor-1260	2700 ug/kg	130 ug/kg
044703-051	0.5 *	Aroclor-1260	3500 ug/kg	130 ug/kg
044703-051	0.5 *	Aroclor-1260	3500 ug/kg	130 ug/kg
044703-011	0.5 *	Aroclor-1260	3800 ug/kg	130 ug/kg
RA28-LINE-4	6 *	Aroclor-1260	3900 ug/kg	130 ug/kg
RA28-LINE-5	6 *	Aroclor-1260	4600 ug/kg	130 ug/kg
044703-011	0.5 *	Aroclor-1260	6800 ug/kg	130 ug/kg
RA28-SP-3	5 *	Tetrachloroethene	86000 ug/kg	3600 ug/kg

* Assumed depth from current surface. Samples were collected from the surface of the excavated area.
The Open Top Tank Area (RA28-LINE) was excavated approximately 6 feet.
The Skid Tank and Pond Area (RA28-SP) was excavated 3-5 feet.
The east field and other areas were excavated at suface (6 inches).

** There is not an FRL for 1,1,1 Trichloroethane, therefore the FRL for 1,1,2 Trichloroethane, which is 4.3 mg/kg, will be used.

TABLE 3-6
URANIUM ABOVE-FRL DATA SUMMARY

Boring ID	Depth (feet)	Parameter	Above-FRL Value	FRL Limit
		Current Data		
A6-FTF-17	1	Uranium, Total	83.4 mg/kg	50 mg/kg
A6-FTF-15	2	Uranium, Total	135 mg/kg	50 mg/kg
A6-FTF-55	2	Uranium, Total	446 mg/kg	50 mg/kg
		Historical Data		
ZONE 3-435	0.1666667	Uranium, Total	1001.958343 mg/kg	50 mg/kg
ZONE 3-435	0.3333333	Uranium, Total	883.571939 mg/kg	50 mg/kg
RA28-SP-3	5 *	Uranium, Total	310 mg/kg	50 mg/kg
ZONE 3-435	0.5	Uranium, Total	243.2857388 mg/kg	50 mg/kg
ZONE 3-456	0.5	Uranium, Total	136.0058316 mg/kg	50 mg/kg
ZONE 3-456	0.3333333	Uranium, Total	112.2879036 mg/kg	50 mg/kg
1672	0.5	Uranium, Total	108 mg/kg	50 mg/kg
RA28-SP-2	5 *	Uranium, Total	100 mg/kg	50 mg/kg
FT-5	0.5	Uranium, Total	89.69221754 mg/kg	50 mg/kg

* Assumed depth from current surface. Samples were collected from the surface of the excavated area. The Skid Tank and Pond Area (RA28-SP) was excavated 3-5 feet.

TABLE 3-7
FTF REVISED LIST OF ASCOCs

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Beryllium
Thorium-228	1,1-Dichloroethene
Thorium-232	1,2-Dichloroethene
Total Uranium	1,1,1-Trichloroethane
	Technetium-99
	Tetrachloroethene
	Trichloroethene
	Toluene

TABLE 3-8
NOMINAL SIZE AND VOLUME OF ABOVE-WAC AREAS

Location	Constituent	Size	Depth	Volume of Material
FTF	Total Uranium	707 ft^2	1 ft	30 yd^3
FTF	Technetium-99		3 ft	
FTF	Tetrachloroethene		15 ft	

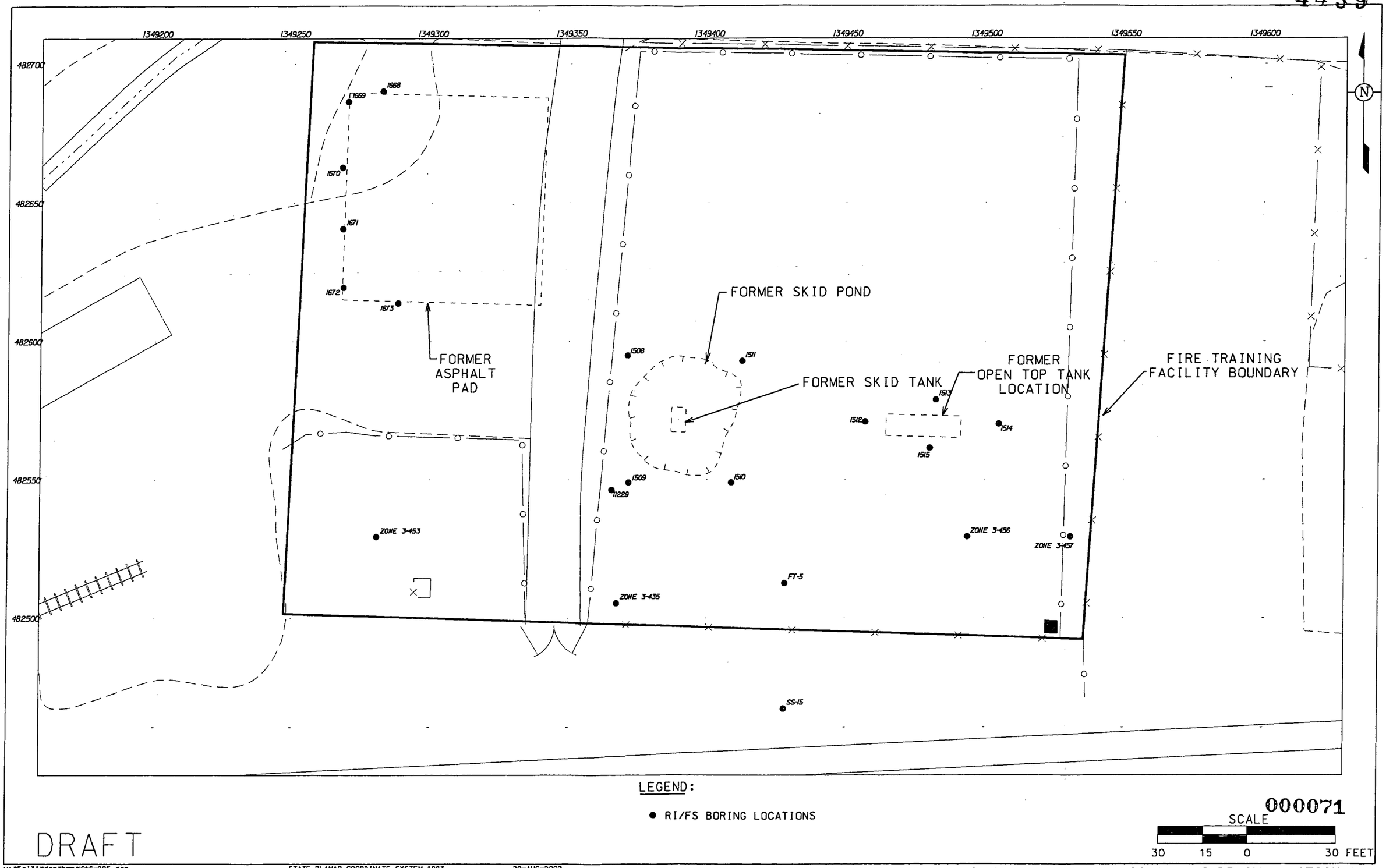


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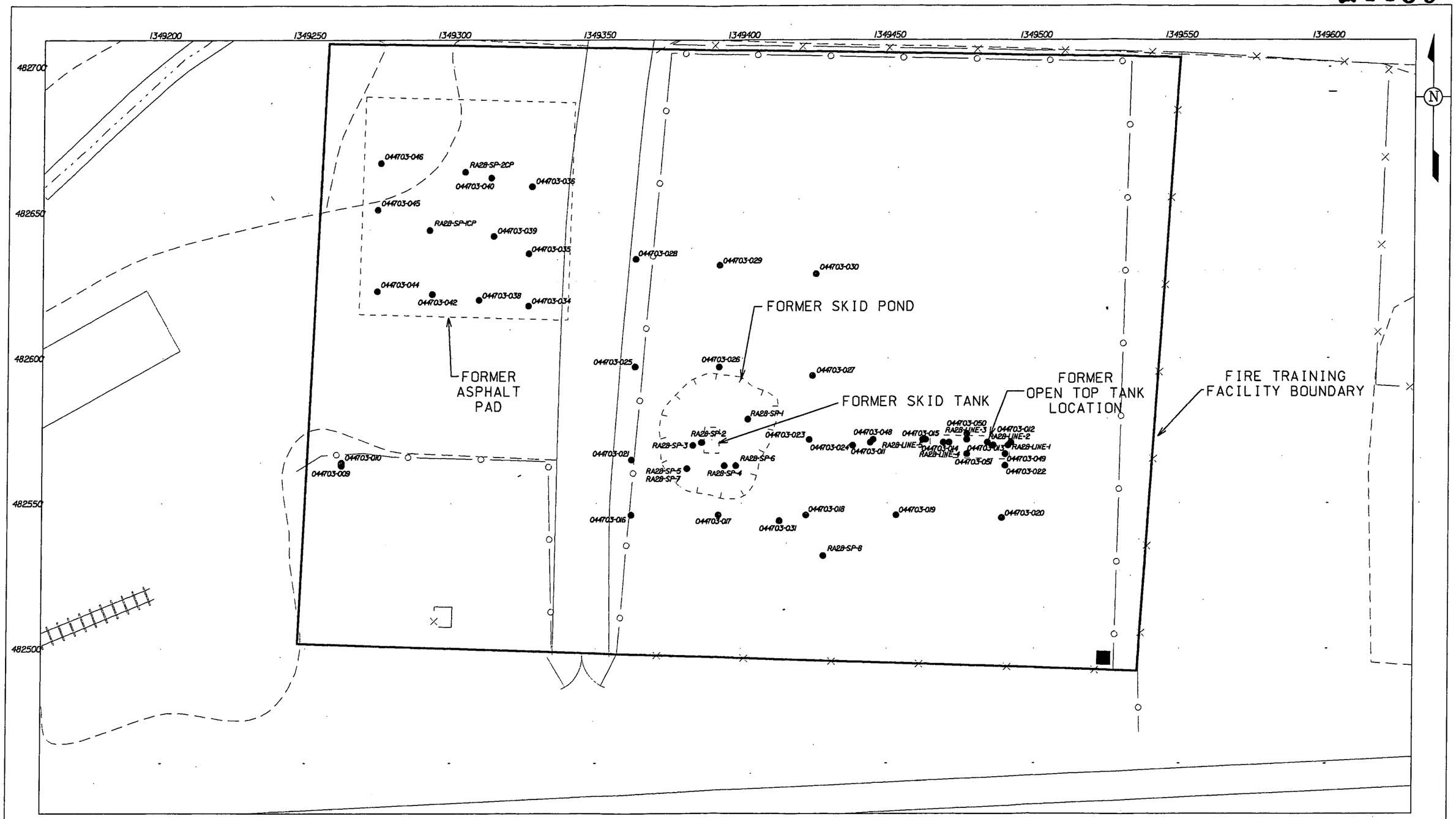
FIGURE 3-1. FIRE TRAINING FACILITY RI/FS BORING LOCATIONS (PRE-REMOVAL ACTION 28)



LEGEND:

● REMOVAL ACTION 28 SAMPLE LOCATIONS

000072

SCALE

30 15 0 30 FEET

DRAFT

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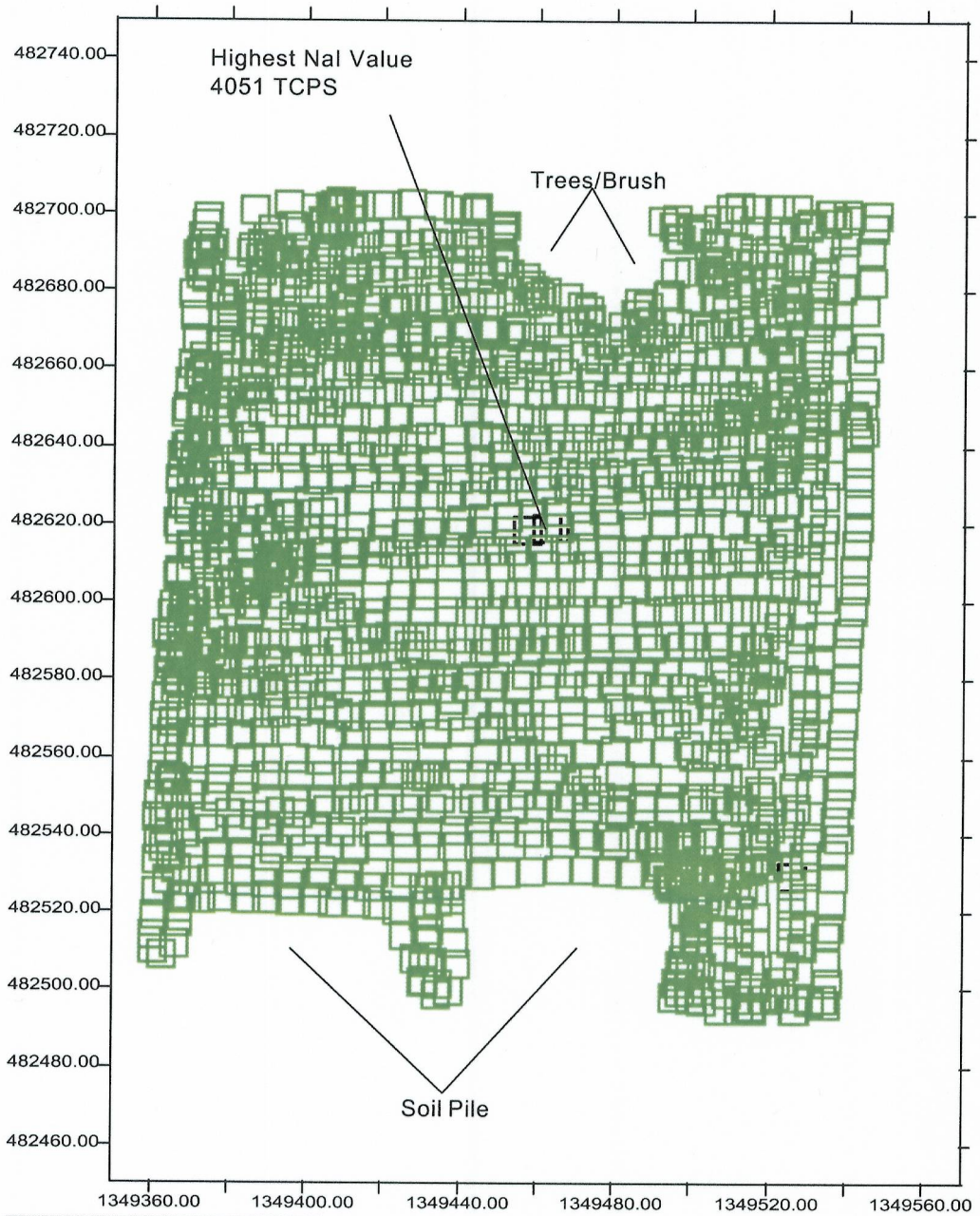
FIGURE 3-2. FIRE TRAINING FACILITY REMOVAL ACTION 28 VERIFICATION SAMPLE LOCATIONS

Figure 3-3 Fire Training Facility, Phase 1 Predesign Real-Time Scan - Total Count

Total Gross Counts per Spectrum
Field of View to Scale
NaI Batch #: RSS2-0272
Measurement Date: 05/03/02

N



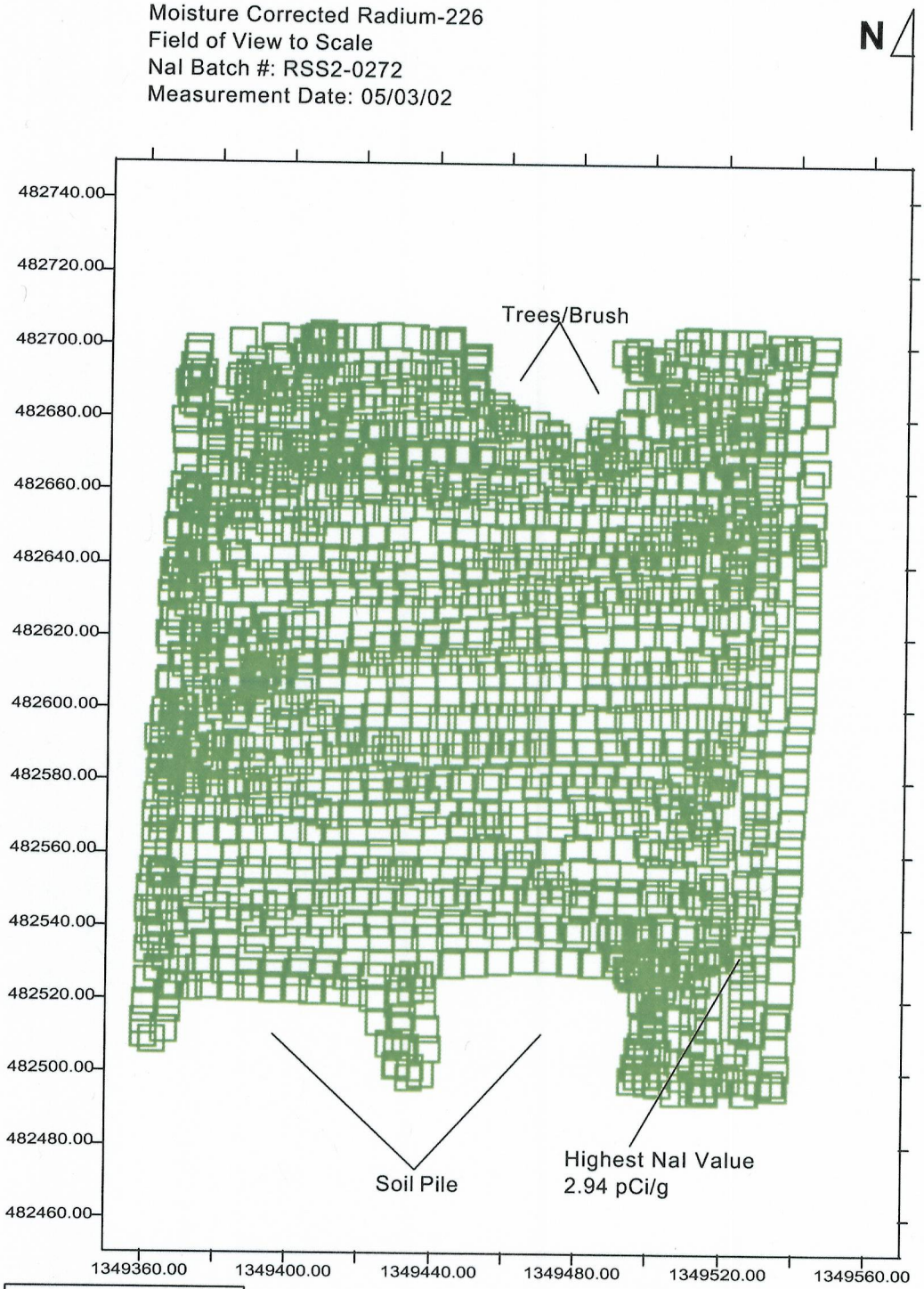
NaI
Total Gross CPS

- 0.00 to 3000.00
- 3000.00 to 5000.00
- 5000.00 to 15000.00
- 15000.00 to 18000.00
- 18000.00 to 99999.00

RTIMP DWG Title: FTF_P1_TC.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: Brian McDaniel
Date Prepared: 05/06/02
Support Data: FTF_P1_NaI.xls

Figure 3-4 Fire Training Facility, Phase 1 Predesign Real-Time - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
NaI Batch #: RSS2-0272
Measurement Date: 05/03/02

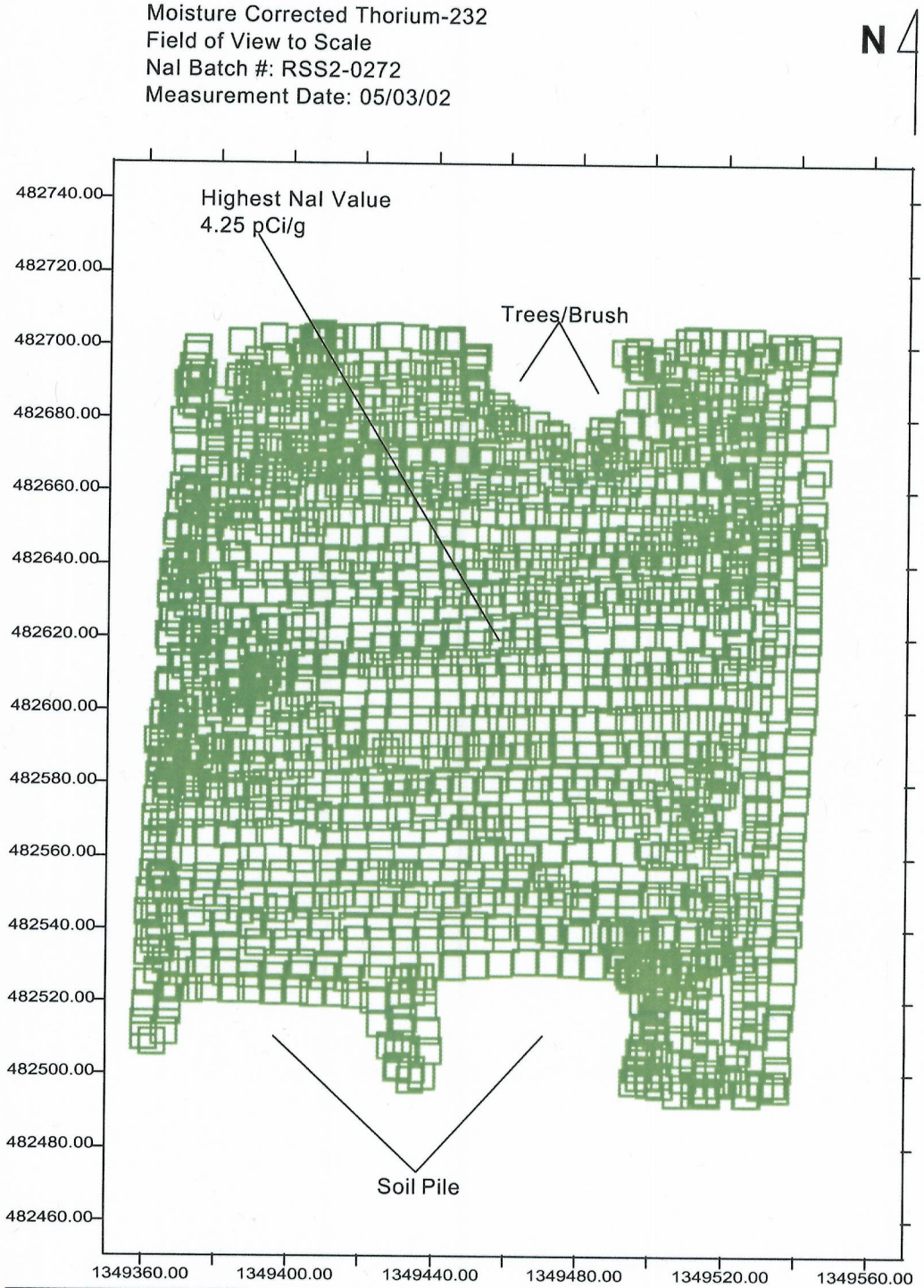


NaI
RA-226 (pCi/g)
-2.48 to 5.10
5.10 to 9999.00

RTIMP DWG Title: FTF_P1_RA.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: Brian McDaniel
Date Prepared: 05/06/02
Support Data: FTF_P1_NaI.xls

Figure 3-5 Fire Training Facility, Phase 1 Predesign Real-Time Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
NaI Batch #: RSS2-0272
Measurement Date: 05/03/02

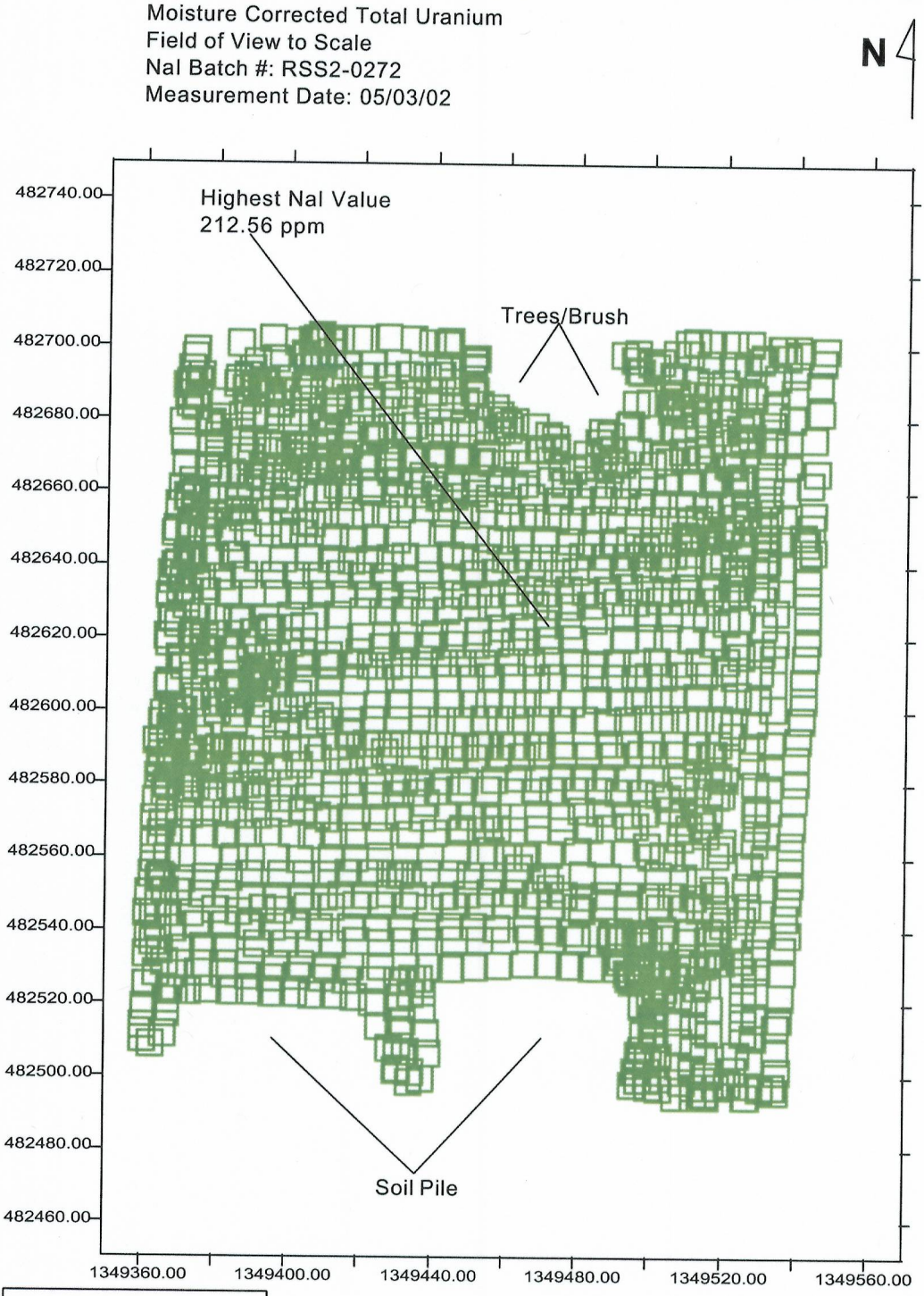


NaI
TH-232 (pCi/g)
-1.00 to 4.50
4.50 to 9999.00

RTIMP DWG Title: FTF_P1_TH.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: Brian McDaniel
Date Prepared: 05/06/02
Support Data: FTF_P1_NaI.xls

Figure 3-6 Fire Training Facility, Phase 1 Predesign Real-Time Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
NaI Batch #: RSS2-0272
Measurement Date: 05/03/02



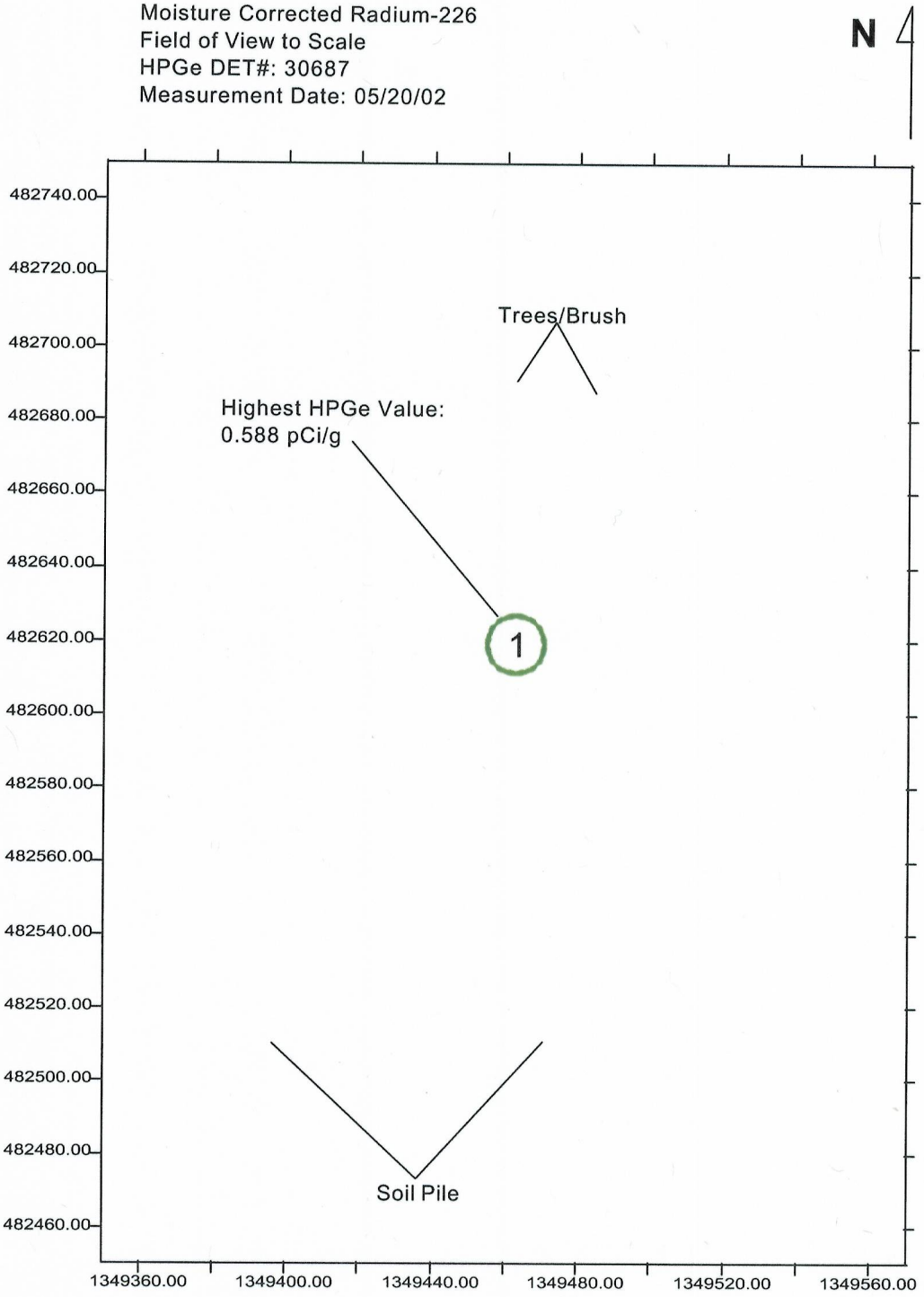
NaI
Total U (ppm)

- -119.30 to 246.00
- 246.00 to 721.00
- 721.00 to 9999.00

RTIMP DWG Title: FTF_P1_TU.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: Brian McDaniel
Date Prepared: 05/06/02
Support Data: FTF_P1_NaI.xls

Figure 3-7 Fire Training Facility, Phase 2 Predesign Real-Time Scan - Radium-226

Moisture Corrected Radium-226
Field of View to Scale
HPGe DET#: 30687
Measurement Date: 05/20/02



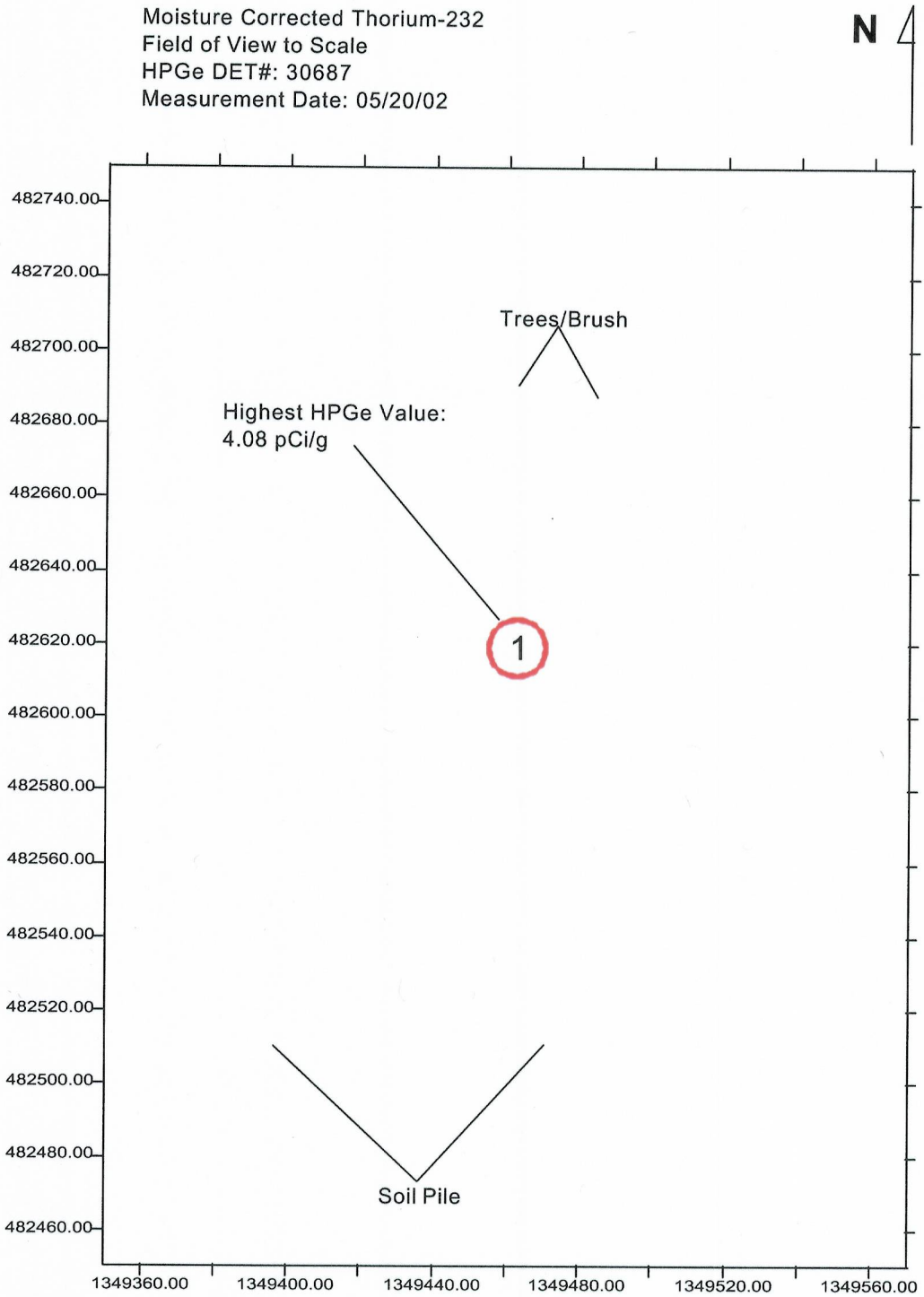
HPGe @ 31cm
RA-226 (pCi/g)

- 0.00 to 3.40
- 3.40 to 9999.00

RTIMP DWG Title: FTF_P2_RA.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: B. McDaniel/11058
Date Prepared: 06/03/02
Support Data: A6_FTF_P2_HPGe_31cm.xls

Figure 3-8 Fire Training Facility, Phase 2 Predesign Real-Time Scan - Thorium-232

Moisture Corrected Thorium-232
Field of View to Scale
HPGe DET#: 30687
Measurement Date: 05/20/02



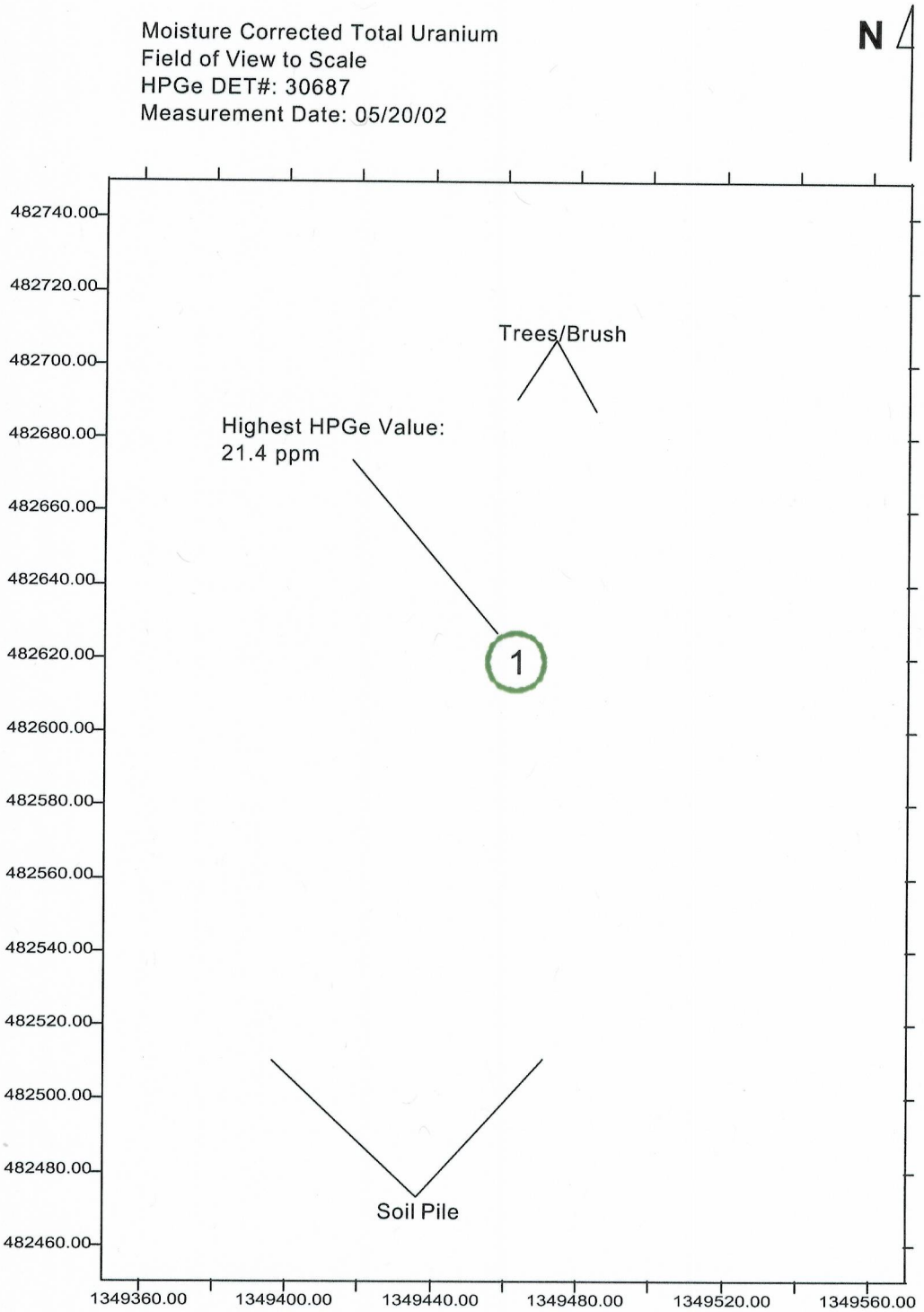
HPGe @ 31cm
TH-232 (pCi/g)

- 0.00 to 3.00
- 3.00 to 9999.00

RTIMP DWG Title: FTF_P2_TH.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: B. McDaniel/11058
Date Prepared: 06/03/02
Support Data: A6_FTF_P2_HPGe_31cm.xls

Figure 3-9 Fire Training Facility, Phase 2 Predesign Real-Time Scan - Total Uranium

Moisture Corrected Total Uranium
Field of View to Scale
HPGe DET#: 30687
Measurement Date: 05/20/02



HPGe @ 31cm
Total U (ppm)

- 0.00 to 164.00
- 164.00 to 928.00
- 928.00 to 9999.00

RTIMP DWG Title: FTF_P2_TU.srf
Project Name: PreDesign in the SWL & the FTF
Project #: 20600-PSP-0002
Prepared By: B. McDaniel/11058
Date Prepared: 06/03/02
Support Data: A6_FTF_P2_HPGe_31cm.xls

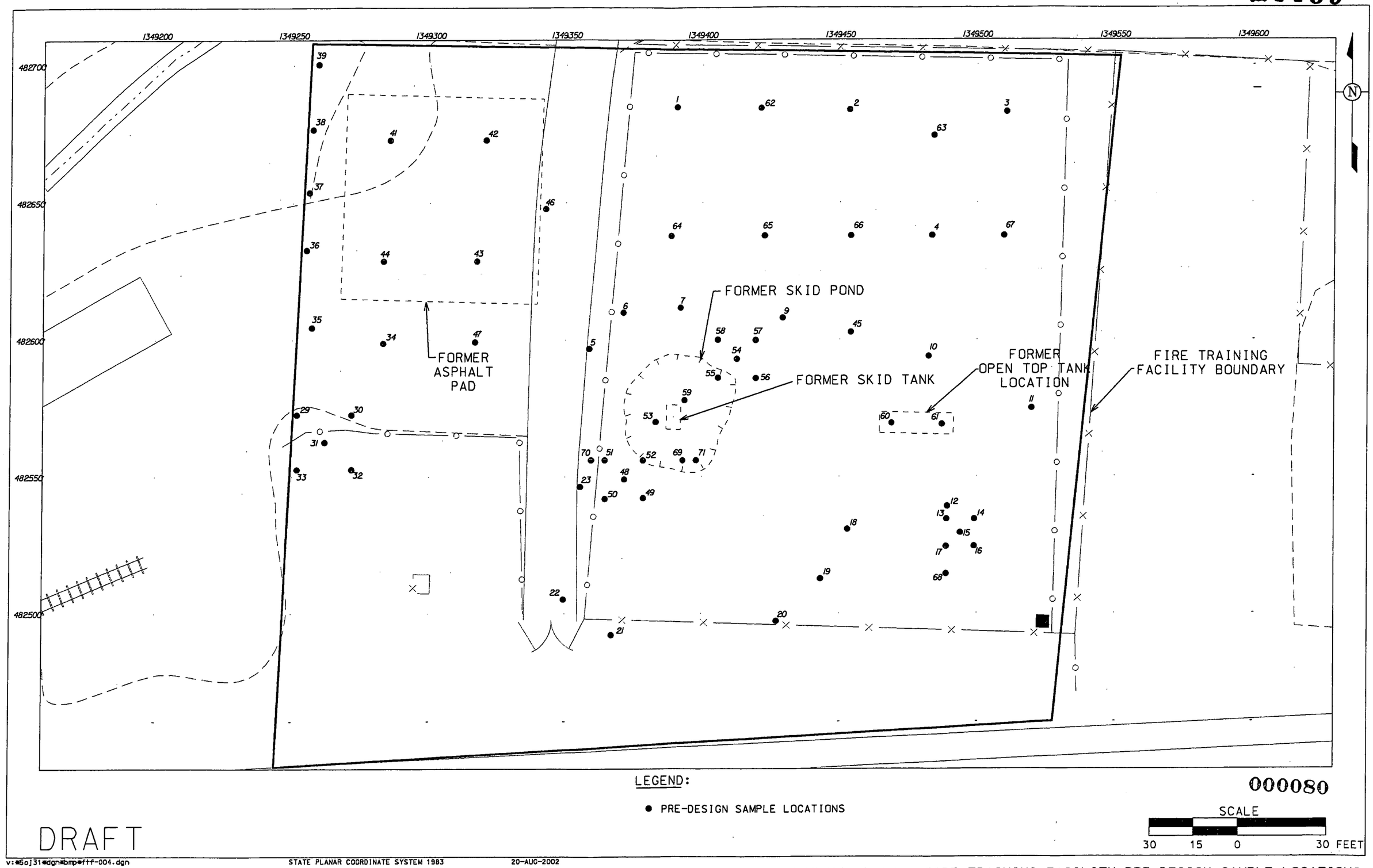


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FIGURE 3-10. FIRE TRAINING FACILITY PRE-DESIGN SAMPLE LOCATIONS

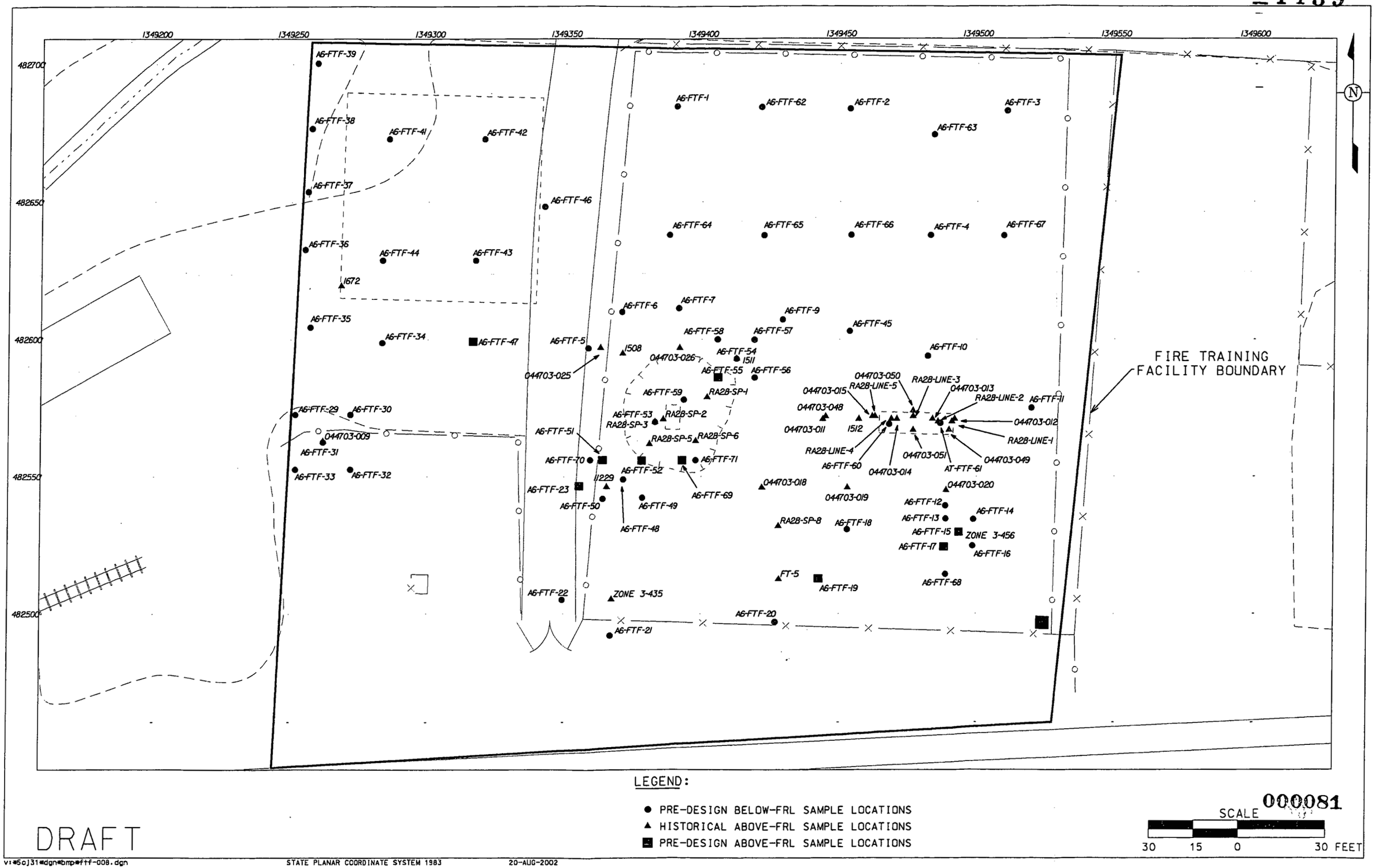

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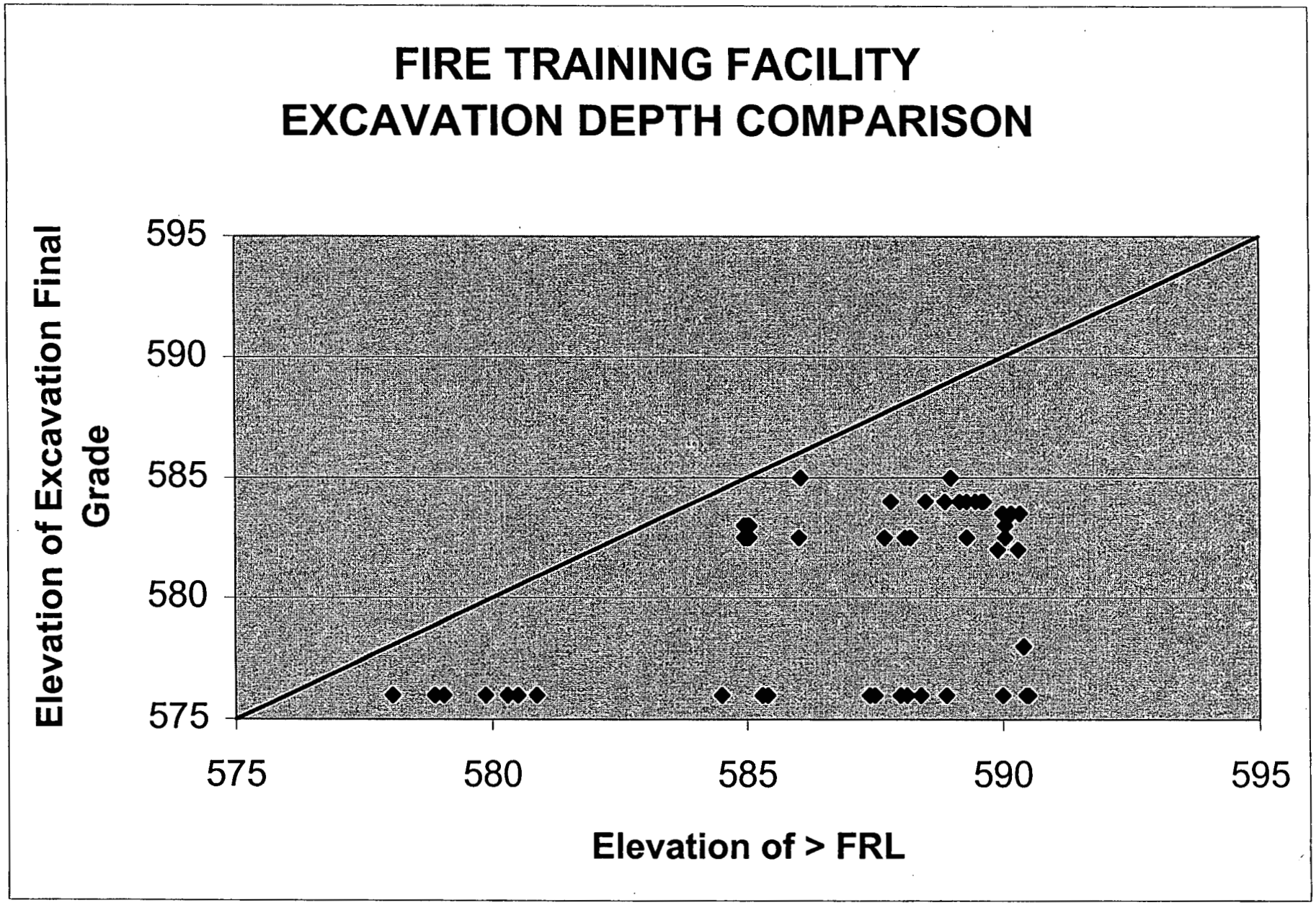
FIGURE 3-11. ABOVE-FRL AND BOUNDING BORINGS

FIGURE 3-12


FIRE TRAINING FACILITY
EXCAVATION DEPTH COMPARISON
Elevation of Excavation Final Grade
595
590
585
580
575
575
580
585
590
595
Elevation of > FRL

4.0 REMEDIAL ACTION APPROACH

This section describes the technical approach to remediation of the SWL and FTF areas within Remediation Area 6. The remedial action approach discussed in this Implementation Plan follows the general guidance provided in Sections 3.0 and 4.0 and Appendix F of the SEP. Construction drawings and technical specifications comprise part of the documentation governing remedial construction activities. Construction activities will be further governed by Construction Traveler (CT) Packages that detail general construction practices, as well as health and safety requirements, for soil excavation and remediation projects at the FEMP.

Remedial actions in the SWL/FTF will begin with site preparation activities, progress into above-WAC soil excavation and at-grade debris removal, and finish with mass excavation of debris and soil exceeding the established FRLs. The following discussion of remedial actions is applicable to both the SWL and FTF unless otherwise noted.

4.1 SITE PREPARATION

Site preparation activities associated with this work include establishing site boundaries and controls, surveying and site layout, isolating utilities, establishing support facilities, managing surface water, and performing real-time scanning. Real-time scanning may be required if site preparation activities involve soil disturbance below a depth of 6 inches. Additional details are provided in the following text and in referenced design drawings and specifications.

4.1.1 Site Boundaries and Controls

Existing radiological control barriers and fencing will remain intact until construction safety fences are established at the excavation limit during site preparation activities, as shown on the SWL/FTF Grading/Drainage Plan drawings. Personnel entering and leaving the excavation area will perform spot frisks before transport to a radiological control facility for full-body monitoring. Haul vehicles from the two work areas will use the haul routes shown on the SWL/FTF Traffic Flow and Material Tracking Plan drawing.

4.1.2 Surveying and Site Layout

Surveys will be performed to establish excavation boundaries and to determine banked soil volumes delivered to the OSDF. The SWL/FTF Layout Plan drawing illustrates excavation area locations as well as some support facilities. The Fluor Fernald Executive Manager or designee (Construction Manager) will field locate many of the support facilities, such as cool-down trailers, secondary haul routes, fuel transfer points, and Special Materials Transfer Areas (SMTAs). The Construction Manager may propose multiple SMTA locations in accordance with Technical Specification Section 02205.

4.1.3 Utility Isolation

Due to the limited number of known underground utilities, and relatively low probability of unknown utilities entering the excavation areas, area isolation trenching methods used in the FPA will not be necessary before SWL/FTF excavation. However, research into potential energized utilities entering the areas will be performed during design and during the penetration permitting process. If active/energized utilities are discovered when searching historical information or during field activities, utility engineers will be consulted on utility removal, isolation, or protection.

4.1.4 Support Facilities

Personnel performing and managing SWL/FTF remedial actions will require change-out facilities, office space, a break trailer, and a cool-down trailer. These activities will make use of the existing support facilities established for OSDF and FPA remediation activities, located either in the northeast corner of the OSDF Material Transfer Area (OMTA) Bulk Debris Area, or in the Receiving and Incoming Materials Inspection Area (RIMIA) facility. A cool-down trailer may be field-located depending on field conditions at the time the work is performed and the accessibility of existing cool-down facilities supporting nearby FPA remediation activities. Any additional facilities will be field-located by the Construction Manager in coordination with surrounding projects. Laydown areas for construction materials and equipment, shown on the SWL/FTF Layout Plan drawing, may be field-located by the Construction Manager in accessible zones outside of excavation areas.

Water needs are limited to dust control. Electrical tie-ins will not be necessary because previously established support trailers are available and portable pumps will be used for surface water management. Portable generators will provide electrical power to pumps and other electrical needs in the SWL/FTF areas. A fuel transfer point will be designated at the contaminated/controlled interface, marked by the

limit of excavation, to refuel field equipment without contaminating fueling equipment, thus eliminating decontamination of refueling equipment.

Haul routes from SWL/FTF excavations to the OSDF, OMTA and SP-7 are as shown on the SWL/FTF Traffic Control and Material Tracking Plan drawing. Material will be loaded into haul equipment located in field-designated perimeter load-outs for hauling to the appropriate destination. An equipment wash pad established in the northwest corner of the OMTA Bulk Debris Area for use during the FPA remediation will be used during these activities. Soil Stockpile 7 (SP-7) will be accessed from the east by entering through the western side of the West OMTA Bulk Debris Area. The use of controlled haul routes means wheel washing is required when accessing the existing haul road from the excavation.

4.1.5 Surface Water Management

Since the SWL/FTF remediation areas are relatively small, a Surface Water Management Plan (SWMP) will not be written for these activities. The following paragraphs, combined with FTF surface water calculations provided in Appendix B, serve as the SWL/FTF SWMP. SWL/FTF excavation water, the combination of surface water and perched groundwater, will be collected within the excavation and pumped or transported by truck for treatment at the AWWT Facility. In general, if the rainfall amount exceeds the maximum amount that has fallen within a 24-hour period over the previous 10 years, then water must be removed from excavations within three days.

4.1.5.1 Surface Water Management – SWL

Excavation water in the SWL will be pumped to the storm sewer system within the FPA for discharge to the SWRB. This requires placing a sump pump in the excavation and connecting the sump to a nearby storm sewer catch basin via HDPE piping for ultimate discharge into the SWRB. The SWL excavation dewatering line will be routed southeast, under the rail spur, to either catchbasin 229 or 230, located west of SP-7. Containing water within the excavation requires plugging existing culverts located at the northeast and northwest corners of the SWL excavation with concrete.

Surface water run-on will be controlled by maintaining existing ditches in the area surrounding the SWL excavation. Silt fence will be installed where necessary to control runoff, specifically along the southwestern edges of the SWL excavation, in accordance with specification Section 02275.

4.1.5.2 Surface Water Management – FTF

Excavation water encountered in the FTF will be sampled for VOCs to determine appropriate treatment and disposal. As detailed in Section 4.4.1, excavation water containing concentrations of organic compounds in excess of 50 micrograms per Liter (μg/L) will be tanked for transport to AWWT for Phase II. Excavation water that passes VOC screening will be tanked for transport to the FPA storm sewer system or the SWRB for subsequent AWWT Phase I treatment. In addition, FTF surface water management requires installing a culvert to maintain the ditch under the relocated Locomotive Maintenance Building driveway (refer to Appendix B for supporting calculations).

Surface water run-on will be controlled using existing ditches in the area surrounding the SWL excavation. Silt fencing will be installed where necessary to control runoff, specifically along the southern and western edges of the FTF excavation, in accordance with Specification Section 02275.

4.1.6 Real-Time Scanning

If site preparation activities will disturb soil below a depth of 6 inches, the Construction Manager will coordinate with the RTIMP Manager to arrange for a real-time scan of the surface prior to disturbance. Site preparation activities can begin after real-time scans verify that uranium levels are below WAC.

4.2 AT- AND BELOW-GRADE STRUCTURE DEMOLITION

Removal of at-grade concrete and asphalt pads/roads will be initiated early to prepare the area for general soil excavation activities. The soil surface below at-grade concrete and asphalt pads/roads will be scanned with *in situ* gamma spectroscopy techniques to determine if excavation is required beyond the limits of known contamination. As detailed below, there are relatively few at- and below-grade structures to be removed during SWL/FTF excavation. Volume estimates for SWL/FTF at- and below-grade debris are provided in Table 4-1.

4.2.1 At- and Below-Grade Structure Demolition – SWL

There are no known at- or below-grade structures located in the SWL excavation footprint.

4.2.2 At- and Below-Grade Structure Demolition – FTF

At-grade structures in the FTF are limited to a section of the North Construction Access Road approximately 200 feet long by 20 feet wide, consisting of 4 to 8 inches of concrete (possibly reinforced)

covered with asphalt. Below-grade structures in the FTF include the footers from the former Fire Brigade Building and two piers from a raised tank that was previously located east of the North Construction Access Road. These structures are located within 3 feet of existing grade. All concrete and asphalt debris transported to the OSDF will be sized to meet physical WAC for the OSDF (DOE 2001a).

4.3 SOIL EXCAVATION, MONITORING AND SEGREGATION

Excavation to remove impacted material will follow the general guidance of Excavation Approach D, as discussed in the SEP. As identified, soil and material characterized as above-WAC or contaminated with organics will be targeted for early removal to minimize cross contamination. SWL/FTF general excavation activities will then remove soil and debris to the design grade.

4.3.1 Above-WAC Excavation

As discussed in detail in the following sections, four above-WAC areas have currently been identified, one in the SWL and three in the FTF excavation area. Characterization will be ongoing to identify and bound potential above-WAC excavations in the SWL/FTF. If found during excavation, real-time monitoring and/or physical sampling will be used, depending on COC, to establish the limits of the above-WAC area. Once identified, an above-WAC area will be staked and a buffer area will be established adjacent to the excavation. Above-WAC excavations will follow the excavation hierarchy previously used for directing excavation sequence requirements in Area 3A/4A.

Above-WAC areas will be excavated in nominal 3 feet ± 1 foot lifts. Lifts may be reduced if the opportunity exists to reduce above-WAC soil volumes by more frequent scanning or sampling. Excavated material containing only above-WAC levels of radiological constituents (uranium and/or technetium-99) will be stockpiled in SP-7 or hauled directly to the Waste Pits Remedial Action Project (WPRAP). Excavated material containing above-WAC levels of organic constituents (tetrachloroethene) will be stockpiled in stockpile AR6-003 for future treatment, along with organic-contaminated material previously stockpiled during 3A site preparation activities. Side slopes will be excavated to 2:1 and monitored to determine material disposition and lateral excavation as necessary to verify that all above-WAC contamination has been removed. Equipment used to excavate, load, haul and place above-WAC material will be decontaminated by rinsing until no visible material is present on exterior surfaces before it is used elsewhere.

The Construction Manager will direct the use of working stockpiles for materials removed from side slopes of above-WAC excavations. Disposal of these materials requires the results of 1) real-time scans performed on the slope formed by the removal of the soil or 2) analytical analyses performed on soil samples collected from the slope. After sampling or real-time scanning, this material will be transported from the working stockpile(s) to SP-7 or the OSDF.

Above-WAC excavation monitoring will consist of monitoring the excavation side slopes to determine if the contamination zone has been captured laterally. When the design surface, or excavation floor, has been reached, real-time scans and/or physical sampling will be conducted, depending on COCs, and the Construction Manager may direct further excavation based on results.

SWL/FTF construction drawings illustrate plan, section, and sequencing requirements for excavating known above-WAC areas. As in the Area 3A/4A Site Preparation and Excavation packages, the approach presented in this IRDP has been broken down and simplified on the construction drawings based on known excavations having specific COCs. However, due to the complexity of above-WAC excavations, and the importance of minimizing the volume of materials requiring potential treatment and/or off-site disposal, the Construction Manager and Waste Acceptance Organization (WAO) will provide field oversight during execution of this work.

4.3.1.1 Above-WAC Excavation – SWL

Excavation of known above-WAC material in the SWL involves excavation to approximately 9 feet deep within an area shown on construction drawings to remove approximately 1,700 yd^3 of material contaminated with total uranium. The plan, section and sequence for this above-WAC excavation are shown on SWL/FTF Above-WAC Excavation Details (SWL) drawing.

4.3.1.2 Above-WAC Excavation – FTF

FTF remedial action involves the excavation of three known above-WAC areas. A 5-feet square above-WAC area is identified around an above-WAC uranium sample point in the southeast area of the FTF excavation. This area will be excavated to a depth of 1 foot, as shown on the construction drawings, producing approximately 2 yd^3 of uranium-contaminated above-WAC soil. An additional 10-feet square above-WAC area is identified around an above-WAC technetium-99 sample point near the center of the FTF deep excavation. This area will be excavated to a depth of 3 feet, as shown on the construction

drawings, producing approximately 11 yd^3 of above-WAC soil contaminated with technetium-99. Finally, a rectangular area approximately 28 feet by 38 feet, between the elevations of 581.0 and 575.5, has been identified as containing above-WAC levels of PCE. This area will be excavated in accordance with Specification Section 02205 and the construction drawings, producing approximately 200 yd^3 of above-WAC soil contaminated with PCE.

4.3.2 HWMUs and USTs

As stated in Section 3.1.4, there is one HWMU in the FTF that requires closure under this project. The FTF was designated HWMU No. 1 because hazardous waste was disposed at the facility. The footprint of the HWMU is identified on the FTF Grading and Drainage Plan drawing. Sampling and analysis for closure will be performed in accordance with the SEP. There are no other HWMUs, nor are there any known USTs, in the SWL/FTF.

4.3.3 General Excavation

General excavation is considered mass removal of soil containing COCs at levels below the OSDF WAC. Below-WAC soil is comprised of above- and below-FRL soil. General excavation design limits are shown on SWL/FTF Grading and Drainage Plans. SWL/FTF cross section drawings show the excavation design profile relative to uranium contamination, existing grade and surrounding structures. Table 4-1 provides a summary of soil and debris volume estimates for SWL/FTF excavations.

The generic approach to massive soil excavation is presented in the SEP. Massive soil excavation is in contrast to discrete soil excavation to remove utilities that lie below FRL contamination. In general, areas will be excavated in nominal 3-foot lifts no more than 4 feet thick. Excavations shown on the SWL/FTF Grading and Drainage Plan drawings will be performed in lifts to allow visual inspection of excavated soil and the cut surface by WAO and the Construction Manager. Time will be scheduled to allow real-time monitoring of newly exposed soil lying below gravel, asphalt, and concrete surfaces, and between excavation lifts. Real-time monitoring will be used to explore potentially unidentified above-WAC zones.

Slopes created during excavation work to remain dormant for more than 24 hours will be no steeper than the following criteria:

- Interim slopes - slopes present for six months to two years, 1.5:1 with a 15-foot minimum horizontal bench every 13 vertical feet

- Temporary slopes - slopes present for less than six months, 1.5:1

These criteria have been established based on the geotechnical properties of the soil and a maximum loading of 108,000 pounds at the top of the slope (DOE 1998c). These criteria limit the excavation equipment size to a Caterpillar 350L excavator or less. Soil sampling and geotechnical testing may be conducted to demonstrate acceptability of less stringent criteria, pending approval by a Professional Engineer registered in the State of Ohio.

4.3.3.1 General Excavation – SWL

General excavation in the SWL will remove approximately 32,800 yd^3 of below-WAC soil and debris for placement in the OSDF. Relative to mass excavations in the FPA, a high percentage of material excavated from the SWL will contain debris, consisting primarily of refuse rather than concrete and metal. As discussed in Section 2.2, a 1992 trenching investigation uncovered a wide variety of waste materials, many of which may be OSDF prohibited items. The volume of debris/refuse in the SWL has been estimated at 14,500 yd^3. Therefore, approximately 42 percent of material removed during SWL general excavation will be debris.

4.3.3.2 General Excavation – FTF

FTF excavation will remove approximately 12,387 yd^3 of soil and debris from removal of soil/debris stockpiles FTF-001 through -004 and general excavation to the design grade. The volume of debris in the FTF is estimated to be 210 yd^3, including debris stockpile FTF-001, building/tank foundations, and the Old Construction Access Road.

Stockpiles FTF-003 and FTF-004 are F-listed stockpiles created during initial HWMU closure activities. These stockpiles, along with cover and containment materials, will be excavated as F-listed material to 6 inches below the stockpile footprint, loaded, and campaigned to the OSDF as a discrete waste, in accordance with Specification Section 02205.

4.3.4 Utilities

As discussed below, the SWL contains a small quantity of below-grade utilities that will be removed during general excavation to the design grade. Neither SWL/FTF excavation is expected to involve removing utility lines that remain after general excavation has achieved the design grade. However, if unknown utilities are discovered during field activities, these utilities will be removed using trenching methods and requirements shown on the construction drawings.

4.3.4.1 Utilities - SWL

The SWL excavation will remove approximately 100 feet of abandoned electrical trench located on the east slope of the excavation. Based on underground utility grid drawings, the electrical trench is located above the design grade, 36 inches below existing grade. Removal of the electrical trench will involve coordination with the FEMP Utility Engineers to ensure that the utility has been de-energized.

4.4 IMPACTED MATERIAL MANAGEMENT

Impacted material consists of contaminated soil and water, man-made debris, and special materials. Excavated impacted material that meets OSDF WAC will be placed in the OSDF in accordance with the Impacted Materials Placement Plan (DOE 2001c). Impacted material will be managed to ensure OSDF placement objectives are met. For example, impacted material needed for the OSDF select layer will be stockpiled to ensure the material quantity needed is available during scheduled OSDF liner or select impacted material layer construction. Additionally, soil/debris placement ratios for the OSDF must be maintained through proper stockpiling of soil and debris. Materials that do not comply with OSDF WAC will be transferred to SP-7 or the SMTA for shipment to an off-site disposal facility. The Traffic Flow and Material Tracking Plan drawings lay out the tracking numbers for impacted material removed from the project area. General information on the handling and tracking of impacted materials is provided in the following text and in Section 3.3.2 of the SEP.

4.4.1 Excavation Water

Excavation water is the mixture of surface water and perched groundwater that collects to create ponded water in the excavation. To help minimize surface water entering the excavation, the topographic surface outside excavations will be sloped away from the excavation area. Silt fencing may be installed to provide sediment control during storm events in addition to surrounding vegetation. Excavation water will be processed through either Phase I or Phase II treatment at the AWWT Facility. Water from

suspect VOC excavations will be sampled and analyzed for VOCs. Water containing concentrations of organic compounds in excess of 50 μg/L will be tanked for transport to AWWT for Phase II treatment. Other excavation water, and suspect VOC waters passing VOC screening, will be pumped to the storm sewer system for subsequent Phase I treatment at the AWWT Facility. Identification of the VOC contamination zones is discussed below.

Excavation water in confirmed VOC contamination areas will be sampled and analyzed on a portable gas chromatography (GC) unit for organic compound COCs based on the affected area prior to a discharge event. The portable GC unit will allow the determination of contamination to be made as soon as possible in the event a 72-hour dewatering requirement is imposed. If any of the constituents exceeds a reasonable detection limit for the portable GC unit [e.g., 50 μg/L for polychloroethene (PCE), trichloroethylene (TCE), and dichloroethylene (DCE)], the water will be transported for Phase II treatment at the AWWT Facility. When each individual constituent level is below 50 μg/L, the water will be discharged to Phase I treatment. The 50-μg/L detection limit for the portable GC unit minimizes the chance for false positive detections that may occur when lower detection levels are used.

A possible contingency for this protocol for management of VOC waters may arise if a large storm event overwhelms the excavation holding capacity. When the holding basins' capacities are maximized due to excessive precipitation, the water would be directly discharged without screening for the indicated VOCs. In addition, to the extent possible, no discharges to the storm sewer system will be made during periods when the SWRB is bypassing or overflowing. These actions will be taken consistent with the bypassing provisions included in the NPDES permit.

In addition to screening of excavation water in confirmed contamination zones, suspect areas of VOC contamination will be investigated by PID screening of soil forming the walls and floors of excavations. If a PID reading exceeds 10 ppm, water samples will be collected from the excavation and analyzed for PCE, TCE, and DCE. Based on the analytical results and protocol noted above, water will be discharged to AWWT Phase I or Phase II treatment.

4.4.2 Contaminated Soil and Debris

Contaminated soil and debris removed from the project area will be assigned the corresponding source tracking numbers identified on the SWL/FTF Traffic Control and Material Tracking Plan drawing.

Excavated soil and debris will be hauled to the OSDF if physical, chemical and radiological WAC are met. Soil and debris that does not meet OSDF WAC will be hauled to SP-7 or an appropriate stockpile based on COCs.

Above-WAC soil will be hauled to SP-7 if organic COCs are below the allowable levels of the off-site disposal facility. Soil contaminated with organic COCs at levels that exceed the OSDF WAC will be hauled to AR6-003, or an appropriate stockpile area. Soil above-WAC for both organic and radiological COCs will be segregated from soil that is above-WAC for organic COCs only. Along with similar soils from the FPA, low-temperature thermal treatment of the soil by a subcontractor is planned. Treated soil will undergo toxicity characteristic leaching procedure testing to establish final disposition of the soil. If treatment is successful, treated soil with below-WAC levels of radiological COCs will be hauled to the OSDF. Treated soil that contains above-WAC levels of radiological COCs will be hauled to SP-7 if COCs meet off-site WAC for organics.

4.4.3 Special Materials

Section 3.3.2.2 of the SEP identifies special materials that, when encountered, require WAO input before determining disposal. Due to the nature of SWL operations, a wide variety of materials from this list may be encountered. Materials from this list that may be encountered in SWL/FTF include:

- Asbestos
- Drums and tanks
- Piping and pumps
- Process residues
- Uranium metal
- Miscellaneous debris
- Acid brick.

Some of these materials can be placed in the OSDF if they meet physical and chemical WAC, and if pipe interiors pass visual inspection. Materials that do not meet OSDF WAC will be hauled to SP-7 or packaged into containers and placed at the SMTA. In general, all special materials that exceed OSDF WAC, except process residues and uranium metal, will be hauled to SP-7. Process residues and uranium metal will be containerized as directed by Fluor Fernald Waste Generator Services and placed at the SMTA. Waste Generator Services will retrieve containers from the SMTA and disposition the material

to an off-site disposal facility. Information on the identification, management, and tracking of these materials is provided in the SEP (refer to Section 3.6 and Appendix F of the SEP).

4.5 GMA BACKFILLING

Impacts to the GMA by SWL/FTF excavation are not anticipated. However, if the sand and gravel associated with the GMA are encountered, excavation activities will be stopped to examine the nature of the material in the bottom of the excavation. A geologist will determine if the GMA has been breached; if it has, the regulatory agencies will be notified and corrective action will be taken. Selected actions will be dictated by weather conditions and/or forecasts.

If a breach of the GMA occurs and precipitation is likely in the next 24 hours, the breach will be backfilled immediately to a minimum of 2 feet with gray clay from the local excavation in accordance with Technical Specification Section 02206. Every effort will be made to cover the exposed sand and gravel of the GMA with gray clay that has been precertified to local FRLs. Physical samples of the 2-foot plug will be taken to allow a certification determination to be made. If samples indicate COCs are present above their FRLs, the backfill area will be re-excavated to remove the soil failing certification.

All ponded water will be pumped from the affected excavation as soon as practical following the precipitation event. When excavation resumes, or in the event that excavation continues because a precipitation event is not imminent, the lateral extent of excavation around the breach will be completed per the design. However, the depth of excavation will be taken as the top of the unconsolidated sand and gravel when this horizon is reached prior to the design depth. Excavation into the sand and gravel deposits of the GMA is prohibited. Once the excavation is complete, backfilling of the breach and sampling of the plug will take place as noted above.

In excavations where gray clay covers the GMA but the clay is less than 5 feet thick, the thickness of gray clay will be brought up to a minimum thickness of 5 feet. Work must be initiated to bring the gray clay up to a thickness of 5 feet within five working days, and ponded water must be continually pumped out of the excavation until the gray clay is returned to a minimum thickness of 5 feet. Certification samples of the gray clay will be taken at the design grade before backfilling. If above-FRL COCs are present, then the backfill area will be re-excavated to remove the soil failing certification.

4.6 PRECERTIFICATION AND INTERIM GRADING

Precertification activities will begin after the design grade has been reached and construction has left the active excavation area. The precertification area will be delineated and controlled to prevent cross contamination of environmental media. Real-time monitoring of the design grade will be performed to precertify the area as attaining the uranium, thorium, and radium FRLs. An existing radiological control point will be used to monitor equipment and personnel entering and leaving the precertification area.

After the precertification process has verified the removal of impacted material, interim grading will be performed to reduce the excavation slopes to a more stable grade. On the north and west sides of the excavation, the slopes can be cut back to achieve stable slopes. However on the south and east sides of the excavation, the slopes cannot effectively be excavated to achieve long-term stable slopes due to the close proximity of the OU1 railroad line. Instead, fill material will be placed on the south and east excavation faces to achieve long-term stable slopes. This should be performed as quickly after the excavation of impacted material as is practical to ensure the stability of the OU1 railroad line. The soil excavated from the north and west excavation faces will be used as fill material to construct the stable slopes on the south and east faces of the excavation. Fill material will be placed and compacted in horizontal lifts.

Restoration grading will occur when the SWL/FTF remediation areas and surrounding areas have been certified as meeting all FRLs. Restoration grading and vegetation requirements for the slopes will be addressed in the NRRP.

TABLE 4-1
EXCAVATION VOLUME SUMMARY

EXCAVATION	VOLUME
SWL	
Total Excavation Volume	34,500 yd^3
Soil Volume	20,000 yd^3
Debris/Rubbish Volume	14,500 yd^3
Above-WAC Excavation Volume	1,700 yd^3
Below-WAC Excavation Volume	32,800 yd^3
FTF	
Total Excavation Volume	12,600 yd^3
Soil Volume	12,390 yd^3
Debris Volume	210 yd^3
Above-WAC Excavation Volume	213 yd^3
Above-WAC (Uranium)	2 yd^3
Above-WAC (Tc-99)	11 yd^3
Above-WAC (PCE)	200 yd^3
Below-WAC Excavation Volume	12,387 yd^3
Stockpile FTF-001 (Debris)	40 yd^3
Stockpile FTF-002 (Soil)	5 yd^3
Stockpile FTF-003 (F-listed soil)	5 yd^3
Stockpile FTF-004 (F-listed soil)	20 yd^3
General Excavation Soil/Debris	12,317 yd^3

5.0 PROJECT-SPECIFIC ENVIRONMENTAL CONTROLS AND MONITORING

This section defines the project-specific environmental controls and monitoring that will be performed during remediation of the SWL/FTF, use of the resulting information, and how the information will be integrated with sitewide monitoring and reporting requirements. Control mechanisms and monitoring/inspection requirements are provided to account for the air, surface water, and groundwater pathways, as well as impacts to natural resources (i.e., natural areas, endangered species, wetlands, and cultural resources). The general sitewide controls and monitoring are discussed in Section 5.0 of the SEP.

The IEMP quarterly reporting cycles provide a link between the individual, project-specific remediation actions across the entire FEMP. For example, the project may provide information such as improvements to the surface-water management system, the location of additional air monitors, or newly identified groundwater pathways for the IEMP reports. Normally, routine Soil and Disposal Facility Project (SDFP) decisions to react and respond to project-specific operating conditions and process-control objectives (e.g., extending boundaries of a real-time survey) will not be reported as part of the IEMP reporting cycles. These types of routine decisions will be maintained as part of the project record and will be considered normal practice to achieve project-specific operating objectives.

5.1 NATURAL RESOURCE IMPACTS

On-property natural resource impacts include those associated with natural areas, threatened and endangered species, cultural resources, and wetlands/floodplains. Section 5.0 of the SEP establishes a three-component strategic control mechanism for natural resource impacts:

- Identify unavoidable impacts to natural resources anticipated to result from remediation activities
- Plan and design remediation activities to limit resource damage that is unavoidable
- Conduct natural resource restoration projects to restore remediated areas.

Unavoidable impacts anticipated within SWL and FTF were identified in the OU2 and OU5 RODs. There are no endangered species or cultural resources identified within SWL and FTF. There are drainage ditches adjacent to both areas that were classified as wetlands in the 1993 sitewide wetland

delineation. These wetland impacts are part of the 10 impacted acres that were anticipated in the CERCLA RODs as discussed in Section 1.0. Impacts to these wetlands will be addressed through implementing wetland mitigation projects outlined in Section 4.0 of the NRRP as negotiated by EPA, OEPA and the U.S. Fish and Wildlife Service. A permit information summary will be prepared, addressing the substantive requirements of Sections 401 and 404 of the Clean Water Act, and will be submitted to the appropriate regulatory agencies.

5.2 AIR PATHWAY

The air pathway includes fugitive emissions (visible dust), airborne radiological particulates, and radon, in addition to noise and direct radiation. To the maximum extent possible, the existing FEMP occupational air monitoring program and the sitewide environmental monitoring program (described in Section 6.0 of the IEMP) will be used. Regulatory protocols established in these monitoring programs will be used to ensure that project-specific data are of comparable quality and are beneficial in evaluating and reporting project-specific air pathway releases. Administrative and engineering control techniques will be implemented in accordance with Fugitive Dust Control Requirements (RM-0047) to mitigate potential emissions.

5.2.1 Noise

Noise control and abatement will include mufflers on equipment and machinery, proper maintenance of equipment and machinery, and rescheduling heavy equipment use times in the field if late operational hours are needed. The number of remediation activities performed after sunset will be minimized.

To ensure that Occupational Safety and Health Administration (OSHA) and American Conference of Governmental and Industrial Hygienists (ACGIH) noise limits are met, an administrative action level below these limits will be set (Section 6.0 of this plan). This level will be used to assess the need for hearing protection for field personnel in the remediation areas, for maintenance of vehicles and machinery, and for additional noise control and abatement.

Noise monitoring will be conducted as part project-specific health and safety requirements. Noise measurements will be made in the field by Fluor Fernald and Contractor Safety and Health (S&H) personnel, using safety and health protocols for noise monitoring. The noise measurements will assess whether administrative action levels are exceeded, the need for hearing protection, the need for

maintenance of vehicles and machinery, the need for additional noise control or abatement, and compliance with OSHA and ACGIH occupational noise limits.

The noise monitoring program will develop area-specific background levels before starting excavation activities and monitor noise levels during remedial activities. Field personnel will be responsible for documenting noise levels in the field in accordance with records management guidelines presented in Section 7.6, as well as for initiating noise abatement measures. If background noise levels are within 5 dBA (decibels on the A-weighted scale) of the administrative action level (85 dBA, as specified in the safety and health requirements), S&H personnel will contact the Project Manager to begin appropriate corrective actions.

5.2.2 Fugitive Emissions

Fugitive emissions shall be controlled in accordance with RM-0047, Fugitive Dust Control Requirements. Water, commercially available dust suppression agents, or other appropriate methods and proactive work practices will be used to minimize dust generation during SWL and FTF remedial activities. In general, dust generation during soil excavation, handling, hauling, and placement will be controlled using work practices that include cleaning paved haul roads or applying water (or other dust suppressant agents) to paved and unpaved haul roads. Water or other dust suppression agents will be applied in sufficient quantities to reasonably minimize dust generation, but not to cause water migration beyond work area boundaries.

For excavation activities, dust control will be focused on making the material less dusty. The principal control mechanism will be the inherent moisture in the soil; during dry conditions, dust control will be initiated before excavation. If visible dust emissions occur during excavation, one or more of the following dust control methods will be used:

- Apply more water mist
- Add surfactant or other agents to the water mist
- Apply resins, crusting agents, or foams in lieu of water mist.

For soil handling, hauling, and placement activities, dust control will focus on making the transported material unlikely to become airborne. The principal control mechanism will be reliance on inherent moisture in the soil coupled with a 20-miles per hour (mph) speed limit during hauling on paved haul

roads (10-mph speed limit on unpaved haul roads). If visible dust emissions occur during handling, hauling, or placement, one or a combination of the following dust control methods will be used:

- Change configuration of material (e.g., place less in the trucks)
- Apply water mist
- Add surfactant or other agents to the water mist
- Apply resins, crusting agents, or foams in lieu of water mist
- Reduce truck speed
- Cover load bed.

The numbers or types of dust suppression equipment in operation will not preclude stopping work if there is visible dust or excessive visible dust. Increasing levels of visible dust indicate a need to increase dust control effort, including possible alteration, slowdown, or temporary suspension of the work activities generating the visible dust. The work activities observed to be generating the visible dust will be temporarily suspended if the visible dust exceeds the site-specific limit or Ohio standard (RM-0047). Dust controls will be increased and/or work practices will be modified to bring the fugitive emissions to a level below the limit/standard during dust-generating activities.

Personnel will be on call during non-work periods seven days per week (including holidays) to respond to an "off-hours dust alert," which is defined as whenever Fluor Fernald gives notification to the contractor that visible particulate emissions exceed the site-specific limits during non-work periods. Site personnel will notify the contractor of such an alert and dust suppression will begin no more than three hours after such notification.

As part of the CT for the project, a Dust Control Plan will be developed that:

- Describes how field personnel will implement the Dust Control Plan, monitor for visible dust, progressively implement increased dust control or alter work activities when required, and maintain appropriate records of dust control activities

- Lists methods to be used to suppress dust and the associated frequency that routine dust suppression measures are to be implemented

- Describes the materials to be used to suppress dust - e.g., water, dust suppression agents, etc.

- Lists the specific types and quantities of equipment to be used to suppress dust

- Provides a description of the notification process, including designation of personnel, that the contractor intends for SDFP personnel to utilize during non-work periods to notify the contractor of an "off-hours dust alert."

Fluor Fernald will review the Dust Control Plan against these criteria. Approval of the plan by Fluor Fernald is required before authorization of earthmoving activities.

Project personnel will tour the active remediation areas at the start of the day and periodically during the day. Real-time observation of visible dust, in accordance with the criteria described in Fugitive Dust Control Requirements (RM-0047), will be used to assess fugitive dust emissions and implement corrective measures, as needed. Additionally, paved roadways/parking areas, unpaved roadways/parking areas, and wind erosion from storage piles will be subjected to visual monitoring in accordance with 40 CFR Part 60, Appendix A, Method 22, "Visual Determination of Fugitive Emissions from Material Sources and Smoke Emission from Flares" (on-site training is required). Excavation, hauling, and storage-pile activities will be subjected to opacity measurements in accordance with 40 CFR Part 60, Appendix A, Method 9, "Visual Determination of Opacity of Emissions from Stationary Sources" (or an approved alternative method). This method requires off-site training.

Field Managers will be responsible for documenting visible emissions and maintaining monitoring records in the field, as well as for initiating fugitive dust abatement measures. In accordance with the record keeping guidelines defined in Section 7.6, daily information that will be recorded as part of the SWL and FTF remediation project includes:

- The date, weather conditions, and scheduled work activities (e.g., excavation, trenching, hauling, placement, compaction, loading, etc.)

- Opacity readings (if any) in accordance with 40 CFR Part 60, Appendix A, Method 9, "Visual Determination of Opacity of Emissions from Stationary Sources" (or an approved alternative method) (Note: not required for off-hours dust alert responses)

- Visual monitoring data (if any) in accordance with 40 CFR 60, Appendix A, Method 22, "Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares"

- Time of dust-alert notification (if any) given to the contractor, names of the individuals involved (SDFP individual who gave the notification, contractor individual notified, and dust-alert responders), and time of initiation of dust suppression activity (Note: required only for days when such notification occurs)

- Identification of areas (or segments) where dust control was performed
- The manner or type of dust control activity(ies) applied to each area or segment
- Application rate of water or other dust suppression agents - at a minimum, tank truck load capacity and number of tank loads applied to each area or segment
- Identification of the party(ies) responsible for the dust control activity in each area or segment - at a minimum, name of the contractor.

5.2.3 Airborne Radiological Particles

All airborne radiological particles associated with SWL and FTF remediation activities are anticipated to be from fugitive emissions. Control mechanisms for fugitive emissions are presented in Section 5.2.2, and these mechanisms provide sufficient control to alleviate environmental and public safety concerns arising from SWL and FTF soil remediation activities.

Airborne radiological particles will be monitored via the sitewide airborne particulate monitoring program presented in Section 6.0 of the IEMP. The IEMP monitoring network surrounds the FEMP and encompasses all the current and expected diffuse and point sources at the FEMP. Data collected under the IEMP particulate monitoring program will be used to assess the collective effect of concurrent remediation activities at the FEMP, per regulatory drivers described in Section 6.0 of the IEMP.

Supplements or modifications to the IEMP monitoring program are not expected as a result of SWL and FTF soil remediation activities. Monitoring stations surround the FEMP and the monitoring frequency and analyses addressed by the IEMP adequately address the COCs in the remediation area. Therefore, there are no plans to relocate monitor stations prior to soil remediation activities in SWL and FTF.

5.2.4 Radon

Radon emissions from soil being remediated in SWL and FTF are not anticipated to be an environmental or public safety concern. Hence, no project-specific radon control mechanisms are needed for SWL and FTF soil remediation activities.

Sitewide radon emissions are monitored via the monitoring program presented in Section 6.0 of the IEMP. No supplement or modification to that program is anticipated for SWL and FTF soil remediation

activities. Radon monitoring stations surround the FEMP site and will not be relocated for SWL and FTF soil remediation activities.

5.2.5 Direct Radiation

Project-specific direct radiation control mechanisms beyond those provided by fugitive emissions control are not required for environmental or public safety concerns associated with SWL and FTF soil remediation activities. Environmental radiation levels associated with SWL and FTF soil remediation activities will be monitored via the sitewide environmental direct radiation monitoring program (Section 6.0 of the IEMP). No supplement or modification to the IEMP is anticipated for SWL and FTF soil remediation activities, and monitoring stations will not be relocated from their present positions.

5.3 SURFACE WATER PATHWAY

In accordance with the NPDES permit (Ohio EPA Permit No. 1IO00004*FD), DOE has developed and implemented the SWPPP to identify potential sources of pollution associated with construction and industrial activities that may affect storm water quality at the facility and describe ways to reduce pollutants within surface water discharges. This plan also contains provisions on the inspection program that must be implemented to ensure that discharges of storm water associated with construction and industrial activities comply with the requirements of the FEMP NPDES permit.

The SWL and FTF are located adjacent to the northern drainage ditch that runs directly to Paddys Run. Impacts to wetlands in the northern drainage ditch are addressed in Section 5.1. Measures will be implemented to minimize runoff from the SWL and FTF into the northern drainage ditch. Once soil remediation activities begin in SWL and FTF, appropriate silt fencing will be installed to control runoff to the northern drainage ditch.

The SWPPP mandates that construction activity inspections will be conducted in the remediation area on a weekly basis. The FEMP's construction activity inspection program performs weekly inspections within all site construction areas and after any rain event totaling 0.5 inch or more within a 24-hour period. Construction activity inspections are documented and maintained as part of the NPDES and SWPPP files at the facility.

Inspections conducted in the SWL and FTF project will ensure that:

- Erosion and sedimentation control measures are in place and are well maintained
- Work practices and housekeeping activities are conducted in a manner that reduces the potential discharge of pollutants in association with storm water discharges from disturbed areas
- Corrective actions related to the establishment and/or maintenance of erosion and sedimentation control structures are documented and tracked to resolution
- Excessive erosion and/or situation to off-property waterways is not occurring as a result of construction activities initiated under the SWL and FTF Part Two soil remediation activities.

The SEP discusses potential project-specific storm water monitoring programs for soil remediation areas located outside the FPA drainage basin. The objectives of such a program would be to monitor performance of erosion and sedimentation control structures (e.g., sediment traps and basins) against their anticipated design efficiencies, and to determine whether the runoff presents an unacceptable impact to surface water quality or presents an unacceptable cross-media impact to the GMA. Specific surface-water monitoring tasks applicable to the SWL and FTF Project are discussed in Section 3.5.1.

5.4 GROUNDWATER PATHWAY

The SWL and FTF are above perched water zones approximately 2.5 to 9 feet below the surface. The perched water zones are present in small isolated and discontinuous pockets of saturated materials. The groundwater from the aquifer is approximately 7 to 20 feet below the surface.

In the SWL and FTF, soil remediation activities are not expected to impact the GMA. The sitewide management strategy for monitoring groundwater during remedial activities is described in detail in Section 3.0 of the IEMP, which lists the objectives, regulatory drivers, monitoring, data evaluation, and reporting requirements for the program.

6.0 PROJECT-SPECIFIC HEALTH AND SAFETY

All FEMP employees, visitors, vendors, and contractors associated with remedial activities in the SWL/FTF must abide by site work permits and a CT prepared by Fluor Fernald. If required by supplied information, a Project-Specific Health and Safety Plan will be developed in accordance with procedure SH-0001, Developing Project-Specific Health and Safety Requirements, excavation and impacted material placement activities related to the SWL/FTF.

An Industrial Hygiene Monitoring Plan will be developed to address COCs for the SWL/FTF project area and will comply with all federal, state, and local requirements (e.g., OSHA and ACGIH).

The CT will identify training requirements, tasks, hazards, and mitigators. The CT may be revised, as tasks and/or associated hazards are identified, added, or deleted. The detailed CT will be maintained at the project site, with controlled copies in the project document control files.

In addition to the permits, CT, and the requirements of this document, Fluor Fernald and any subcontractors will comply with all federal, state, and local requirements (e.g., OSHA). Fluor Fernald managers and supervisors are responsible for ensuring that the CT complies with the environmental S&H requirements and ensuring compliance with the Work Plan. All personnel have stop-work authority for imminent safety hazards resulting from noncompliance with the applicable S&H practices. S&H requirements and procedures for this Implementation Plan will be governed by the Safety Performance Requirements Manual (RM-0021), site work permits, CT, and the overall strategy discussed in the Section 6.0 of the SEP.

Fluor Fernald will assign an occupational S&H representative to the design team to review all project design documents and ensure compliance with all applicable worker safety and health regulations. Fluor Fernald will provide all radiological occupational monitoring, including Radiological Control Technicians (RCTs), to support remediation activities. The radiological work requirements for SWL/FTF remediation activities will be detailed in activity-specific Radiological Work Permits. Personnel performing work under a Radiological Work Permit will be briefed on the specific hazards and task requirements before work begins. Radiological control personnel will evaluate the data obtained from field surveys to determine the effectiveness of the radiological controls.

Removal of bagged asbestos and training of workers involved with removal of buried asbestos will comply with all federal, state, and local regulations. Fluor Fernald Construction Management will provide trained personnel to handle and manage all asbestos activities. Special personal protective equipment and work practices will be defined in an Asbestos Work Permit and the Asbestos Abatement Work Plan. Air sampling for asbestos will be performed as required by OSHA.

The safe excavation of medical waste will be addressed in the CT and Work Permits, including any special personal protective equipment required for this excavation. The Fluor Fernald Medical Director will be contacted prior to completion of work plans and permits to determine whether special medical monitoring, immunizations, or work practices are needed.

Fluor Fernald will provide S&H coverage, including air sampling for non-radiological contaminants. Fluor Fernald will perform periodic walk-throughs to assure compliance with OSHA regulations and S&H requirements.

7.0 REMEDIAL ACTION MANAGEMENT STRATEGY

7.1 ORGANIZATION AND RESPONSIBILITIES

The 1991 Amended Consent Agreement between DOE and EPA Region V (EPA 1991) decrees that both agencies have ultimate project management responsibility, with DOE as the designated lead agency. OEPA has an oversight and advisory role, as defined by regulatory agreements, for wastewater management (NPDES), hazardous waste management and HWMU closure, dust and noise control, groundwater monitoring, and air and water pathways.

The DOE-FEMP Remedial Action Project Manager is responsible for ensuring that FEMP remedial actions meet project goals, standards, specifications and requirements, while the DOE OU5 Team Leader provides DOE-FEMP programmatic direction for at- and below-grade remediation of SWL/FTF. DOE-FEMP will assign a Facility Representative to conduct field oversight of the project through technical managers that will be responsible for construction, excavation/remediation, engineering, QA/QC, S&H, environmental controls and monitoring, and other pertinent aspects of the project. The DOE-FEMP Facility Representative and Technical Leads will consult with the OU5 Team Leader or DOE Remedial Action Project Manager, as appropriate, to seek prompt resolution of any issues or problems.

DOE's primary contractor, Fluor Fernald, is responsible for overall management and remediation at the FEMP. Remedial activities will be performed by the SWL/FTF Project Team, which will consist of personnel working for DOE's primary contractor. The SWL/FTF Project Team consists of SDFP personnel supported by other FEMP functional areas and subcontractors as necessary. Senior SDFP personnel will provide project management, construction management, technical, and regulatory guidance to the Project Team.

As work progresses, the project organization will change to perform each particular phase of the project as efficiently as possible. The basic organization will stay the same throughout the project; however, leadership will be shifted between the SDFP Engineering/Planning Manager to the SDFP Execution Manager (also called the Construction Manager) during the project. During the characterization, design, and certification phases, the project will be managed by the Engineering/Planning Manager. During the construction phases, the project will be managed by the Execution Manager. This organizational

structure provides clear lines of responsibility and experienced leadership to the appropriate technical phases of the project.

The SWL/FTF Project Team includes personnel in the following groups (refer to Figure 7-1):

- Management
- Primary technical areas
- Functional support.

The roles and responsibilities of SDFP personnel within each group are presented below, and personnel who serve as points of interface between SDFP and other FEMP projects are discussed in Section 7.8.

7.1.1 Management

SWL/FTF management includes the SDFP Project Director, Deputy Director, Engineering/Planning Manager, Execution Manager, and administrative support. Each of these positions is discussed below, and many of the positions are described in greater detail in FEMP procedures and project documents.

7.1.1.1 SDFP Project Director

The SDFP Project Director (Project Director) has overall responsibility for the general direction, guidance, management, and oversight of the project, and reports directly to the Director of Projects. In this role, the Project Director's direct reports include the Engineering/Planning Manager, the Execution Manager and the SDFP Deputy Director (Deputy Director). The Project Director also serves as the primary contact for the SDFP with the DOE and the regulatory agencies. In the Project Director's absence, or as assigned by the Project Director, the Deputy Director will have the overall responsibilities of the Project Director.

7.1.1.2 Engineering/Planning Manager and Execution Manager

The Engineering/Planning Manager and Execution Manager have overall responsibility to complete the project scope within budget and on schedule. The transition point between the design and construction phases of the project is the approval of the IRDP and CFC drawings. During the characterization, design, and certification phases of the project, the project is managed by the Engineering/Planning Manager, including direct reports from Engineering, Restoration Management, Characterization/Waste Management, and RTIMP. Support is also provided from other SDFP personnel from QA/QC, project

controls, administration, S&H, radiological control, surveying, and construction. During construction, the overall project is managed by the Execution Manager and direct reports, including construction superintendents, construction engineers, labor support, logistical support, S&H, and radiological control, with support from the Engineering/Planning Manager and team.

The general responsibilities of the Engineering/Planning Manager include:

- Overall management of characterization, design and certification phases
- Developing the IRDP and obtaining regulatory approval of the project
- Assuring the technical accuracy and quality of the CFC drawings and the technical specifications through the completion of construction
- Ensuring that the DCN process is properly evaluated and efficiently managed by the Project Engineer
- Managing the Project Engineer, Characterization/Waste Manager, RTIMP Manager, and other SDFP resources to provide timely and sufficient technical support per the Execution Manager's request during construction
- Facilitating implementation of FEMP oversight functions (e.g., QA/QC, WAO, etc.) on engineering and characterization procedures
- Closing Nonconformance Reports on engineering and characterization procedures and/or deliverables.

The Execution Manager is in charge of, and accountable for, SWL/FTF construction activities, including:

- Managing SDFP construction personnel (i.e., Construction Superintendents, Construction Engineers, Construction Coordinators, Logistical Support, Surveying/CADD, and Labor Support)
- Obtaining the required FEMP permits and ensuring permit requirements are fully understood and followed by field personnel
- Facilitating timely and sufficient implementation of FEMP oversight functions (e.g., QA/QC, S&H, WAO, etc.) on construction procedures and/or deliverables
- Closing Nonconformance Reports on construction procedures and/or deliverables
- Providing documentation, information and support to satisfy the Standard Start-up Review requirements for long-term pumping facilities

- Requesting engineering, characterization, and other administrative support during construction through the Engineering/Planning Manager.

7.1.1.3 Records Management

Project records are submitted to Engineering/Construction Document Control (ECDC). Project personnel are responsible for the management of project records until they have been submitted to ECDC. Specific responsibilities of project personnel include:

- Interfacing with ECDC
- Managing project documents
- Coordinating the review and comment response process for project documents.

7.1.1.4 Project Controls

The Project Controls group provide the Project Director, Engineering/Planning Manager, and Execution Manager with cost and schedule information for control accounts within the project. Specific responsibilities include:

- Ensuring cost and schedule requirements are defined, planned, and monitored against an integrated baseline so that performance can be measured and reported consistent with overall commitments, budgets and available funding
- Establishing cost, schedule, and technical baselines and maintaining them through the issuance of change proposals
- Collecting monthly status reports to identify trends which may result in forecast variances from the baselines
- Assisting the SDFP Cost Account Manager and other project personnel in the various administrative duties associated with establishing baselines and forecasts, and ensuring that charges are directed to the proper accounts as defined in the baselines
- Working with sitewide training coordinators to ensure that individuals assigned to the project are in compliance with established training procedures and guidelines
- Working with project and site commitment trackers to ensure that project commitments are entered into the tracking systems and that responsible personnel are kept informed of the requirements of each commitment
- Providing adequate documentation of commitment completion to project and sitewide trackers.

7.1.2 Primary Technical Areas

The primary technical areas that support soil remediation in SWL/FTF are:

- Engineering
- Construction
- Characterization.

7.1.2.1 Engineering

The SDFP Engineering staff (engineering staff) under the SDFP Engineering Manager (Engineering Manager) direction perform Title I and II design and engineering services by creating CFC design drawings and technical specifications. The engineering staff also prepare specific sections of the Implementation Plan and provide technical input during the development and review of the IRDP, including the CFC package. The Engineering Manager reports to the Engineering/Planning Manager on project-specific remedial designs, as well as associated documentation and design modifications. During construction, the Engineering Manager will assign a Project Engineer who will perform Title III engineering services, including Requests for Clarification or Information (RCIs) and and/or DCNs. Specific responsibilities of the engineering staff include:

- Preparing CFC engineering documents
- Developing responses to RCIs
- Developing, reviewing, and/or approving DCNs
- Reviewing and approving vendor data submittals or engineering and design components
- Revising construction drawings and technical specifications when necessary
- Reviewing and approving "as-built drawings" supplied by the construction contractors at the completion of field work
- Preparing work statements and verifying that contractual work has been performed by the contract CADD technical staff
- Verifying that regulatory commitments are completed and approved
- Conducting inspection of erosion and sediment control measures.

7.1.2.2 Construction

Under the lead of the Execution Manager, remedial action construction will be performed by building trades labor and/or the construction support contractor reporting directly to SDFP construction management personnel. The Execution Manager has Construction Superintendents, Construction Engineers, Construction Coordinators, Logistical Support, Surveying/CADD, and Labor Support personnel on staff to support these activities. During remedial design, construction will provide input in the form of lessons learned and formal reviews of design drawings and technical specifications to ensure the design is constructable. Specific responsibilities include:

- Managing the building trades labor force to self perform the SWL/FTF construction
- Coordinating daily work activities in the field and providing technical direction to the construction support contractor as necessary
- Providing, reviewing, and/or approving submittals as listed on the submittal register prepared by Engineering
- Utilizing project and functional area resources as necessary
- Installing and maintaining erosion and sediment control measures.

Construction field personnel will be qualified to supervise the performance of tasks associated with the SWL/FTF remedial activities. They are responsible for coordinating and supervising their work as well as any subcontractor work in the SWL/FTF. At a minimum, Construction representatives will be responsible for the following:

- Implementing a safety program in accordance with FEMP requirements
- Discussing and interpreting the SWL/FTF design and informing Engineering of any discrepancies between the plans, specifications and field conditions
- Distributing documentation required by the project specifications in a timely manner
- Attending project coordination meetings
- Scheduling the applicable remedial activities
- Maintaining a daily log of SWL/FTF activities and assisting the Execution Manager or designee in reviewing and approving submittals, as necessary
- Implementing and verifying QC procedures required of the contractor and/or their subcontractors.

7.1.2.3 Characterization

The Characterization/Waste Management Manager (Characterization Manager) will coordinate SWL/FTF field measurements, sample collection, laboratory analyses, and data management associated with the characterization of waste materials and soil in SWL/FTF. These responsibilities include:

- Developing PSPs and coordinating sampling and analysis to support predesign characterization activities
- Evaluating and reporting characterization data to provide recommendations and documentation
- Reporting precertification and certification sampling/measurements.

The Characterization Manager will oversee sampling and analytical activities that support the remedial design and certification of the SWL/FTF. Sampling personnel are responsible for providing input on PSPs, collecting field data, and performing data management for project sampling activities, as directed by the Characterization Manager. An exception to this is scheduled environmental monitoring outlined in the IEMP, which is performed by environmental monitoring personnel. The individual sampling tasks are defined in PSPs prepared by the Characterization Manager and support personnel.

7.1.3 Functional Support

The SWL/FTF Project will require support from personnel in other FEMP functional areas, and these individuals will be matrixed to the project. Generally, the lead technical group will manage the functional support staff. To the extent possible, functional support will be provided by personnel dedicated to the SDFP (e.g., QA/QC, S&H, etc).

7.1.3.1 Safety and Health

S&H support during the project will be provided by the S&H Manager and his direct reports. This support will include:

- Preparing S&H documents for the project (including a Safety Assessment)
- Reviewing documents as they are prepared for compliance with S&H requirements
- Implementing the SWL/FTF Project-Specific Health and Safety Plan, as required
- Assuring that FEMP personnel and contractors follow safe work practices.

The S&H Manager and his direct reports have stop-work authority if unsafe work practices go uncorrected. In addition, any employee working at the FEMP can stop work if they feel that a work situation is unsafe.

7.1.3.2 Radiological Control

Radiological control support during the project will include:

- Preparing required radiological control documents for the project (including radiological ALARA
- Reviewing project documents as they are prepared for compliance for radiological requirements.

7.1.3.3 Environmental Compliance

Environmental Compliance support during the project will come from the Closure Project Regulatory Management Division when needed and it may include:

- Preparing required Environmental Compliance documents for the project, including the ARARs and TBC summary in the Design Criteria Package and the ARARs crosswalk
- Reviewing project documents as they are prepared for Environmental Compliance requirements
- Coordinating with internal and external groups, including regulatory agencies, regarding regulatory matters
- Providing oversight to ensure compliance with environmental requirements.

7.1.3.4 Quality Assurance/Quality Control

The SDFP QA/QC Manager and his direct reports (QA/QC representatives) will be matrixed to the project from the FEMP QC Operations organization and the QA/QC Manager will report to the Project Director in an administrative fashion, while retaining an independent oversight role. The QA/QC Manager will be responsible for developing and implementing QA plans for the project, with the primary responsibility being oversight of QA/QC activities during design, sampling, waste disposition, and construction excavation tasks. To ensure compliance with FEMP requirements and procedures, the QA/QC representatives will monitor and provide support to the project in accordance with quality program elements identified in the FEMP Quality Assurance Program (RM-0012), the Sitewide

CERCLA Quality Assurance Project Plan (SCQ), and the SEP Quality Assurance Project Plan. QA/QC representatives have stop-work authority if quality concerns go unresolved.

7.1.3.5 Waste Disposition

A FEMP WAO representative will provide waste management support. Support will include preparation of Project Waste Identification and Disposition forms (PWIDs), definition of Material Tracking Locations (MTLs), technical direction and oversight for waste stream segregation and management, preparation of Field Tracking Logs (FTLs) and OSDF Manifests, preparation of waste stream profiles, and coordination with the Execution Manager and the Waste Management Manager for handling and disposition of waste streams.

7.1.3.6 Natural Resources

Personnel within the Natural Resources organization will be responsible for assessing potential damages to natural resources within SWL/FTF during the design and planning stages of the project. Natural resources personnel will also be responsible for planning and implementing interim and final restoration of SWL/FTF as described in the NRRP. However, natural resources personnel will not monitor natural resources impacts, as this monitoring is covered under the IEMP and is performed by environmental monitoring personnel.

7.1.3.7 Cultural Resources

Cultural Resources will be responsible for handling unexpected discoveries of cultural resources during site preparation and excavation in SWL/FTF. Because much of the upper 2 to 3 feet of soil in the production area has been disturbed, cultural resources should not be found during site preparation activities. However, the deep excavations to remove uranium contamination could encounter cultural resources, which will be handled in accordance with Section 7.5.3.

7.1.3.8 Procurement

FEMP Procurement will assist the SWL/FTF Project Team in obtaining equipment, services, and materials needed or the project. The principal support will be in the area of procuring materials and equipment for removal of soil and at- and below-grade concrete structures. Procured equipment and material will meet the technical specification requirements defined in the submittal register. Vendor data will be submitted to the project team management to review and ensure design and technical

specification requirements are met. Responsibility for maintenance and repair of procured equipment and material lies with Construction.

7.1.4 Coordination of Excavation Site Activities

Several non-excavation activities will be on going at each active excavation site. Because of the potential safety hazards associated with large construction equipment and open excavations, these activities must be coordinated and supervised. Non-excavation activities include:

- Visual observation,
- Sampling and monitoring
- Radiological occupational monitoring
- Asbestos monitoring
- Material documentation
- Occupational S&H monitoring
- Construction monitoring
- Surveying
- Visual dust monitoring
- Environmental monitoring
- Safety inspections.

The following paragraphs describe each of these activities, the personnel involved, and the time required for their tasks. In addition to the coordination responsibilities, Construction will have one full-time equipment operator, the equivalent of one full-time truck driver, and a part-time supervisor at each active excavation area.

7.1.4.1 Visual Observation

WAO and Construction personnel will monitor the excavation face to identify special materials encountered during excavation. Special materials that might be encountered during excavation activities include asbestos, miscellaneous debris, piping, non-pressurized containers, non-soil residues, uranium metal, and acid brick. A complete list of special materials is given in Section 2.5.8 of the SEP.

7.1.4.2 Sampling and Monitoring

Physical sampling and/or real-time monitoring will be performed as necessary during excavation of SWL/FTF. In general, real-time monitoring will be conducted after each excavation lift in areas known to contain soil above the OSDF radiological WAC. HPGe monitoring may also be used to precertify the area with respect to achieving FRLs for uranium, thorium, and radium. Physical samples may be

necessary to characterize suspect zones when special materials are encountered. Sampling and monitoring work will be performed under the direction of the Characterization Manager.

7.1.4.3 Radiological Occupational Monitoring

Radiological Control will have one full-time RCT in the field to monitor the ambient radiation level of the excavation, ensure RWP compliance, assess changes in ambient radiation levels that affect the radiological classification of the area, and to scan any special materials encountered. Additional information on RCT monitoring and oversight is provided in Section 7.3.4.

7.1.4.4 Asbestos Monitoring

When excavation activities encounter material suspected of containing asbestos, a qualified asbestos hazard abatement specialist (as certified by the Ohio Department of Health) must be present to monitor the removal of the material. Personal breathing zone and general area air sampling for asbestos may be required. Asbestos is likely to be encountered during the removal of electrical lines and utilities, and it may also be found in the form of buried transite panels.

7.1.4.5 Material Documentation

A WAO representative will complete the OSDF Manifest and FTL to document the transfer of material from SWL/FTF to the OSDF or other MTLs. Trucks hauling to the OSDF from SWL/FTF must leave the excavation with an OSDF Manifest. The manifest will track the material to a project by identifying initial, interim, and final MTLs. The WAO representative will use verbal and written information from contractor personnel to document movements between MTLs. Additional information on field documentation information management can be found in Section 3.6.4 of the SEP.

7.1.4.6 Occupational Health and Safety

FEMP S&H will be responsible to monitor the work area for occupational health and safety concerns that include occupational dust, compliance with the CT, chemical exposure, other hazards, and changes in field conditions affecting worker safety. FEMP S&H will periodically observe health and safety conditions at the active excavation area. Additional monitoring information is discussed in Section 7.3.3.

7.1.4.7 Construction Monitoring

FEMP Construction will direct and monitor the remediation work for compliance with the CFC documents. One full-time FEMP construction person will be assigned to SWL/FTF field activities and additional part-time personnel will be assigned on a periodic basis. Other surveillance and inspection responsibilities are discussed in Section 7.3.2.

7.1.4.8 Surveying

Construction will have a two- to three-person survey crew in the field on an intermittent basis to provide construction control and measure the excavation volume for progress reporting.

7.1.4.9 Visual Dust Monitoring

Construction will have the primary responsibility to monitor the construction area for compliance with the best available technology dust policy requirements. Additional details on fugitive dust control requirements (i.e., per RM-0047) and best available technology dust policy are discussed in Section 5.0 of the SEP.

7.1.4.10 Environmental Monitoring

FEMP personnel will conduct environmental monitoring on a regular basis. Weekly inspections of surface water control facilities will be supplemented with inspections after every major rain event, per the SWPPP requirements and Section 3.5.1. Groundwater and air monitoring is covered under the IEMP.

7.1.4.11 Safety Inspections

The Execution Manager or designee will lead a weekly joint safety inspection of the work area. Participants will include Construction and S&H representatives. Additional S&H oversight functions are discussed in Section 7.3.3.

7.1.5 Field Team

The typical field team that will provide oversight at each excavation will consist of one RCT to cover occupational monitoring of ambient radiation, one WAO representative to observe the excavations, one WAO representative to prepare waste manifestation documents and one construction representative for oversight of field activities. It is possible that more people could be near an active excavation site at any

one time (e.g., utility engineer, S&H, project management, etc). However, only personnel required for actual construction activities will be allowed within 50 feet of the active excavation.

7.1.6 Management of Field Personnel

Personnel will sign in with Construction before entering the excavation area and sign out upon leaving the area. This type of administrative control helps track personnel in the event of an emergency.

7.2 CONFIGURATION MANAGEMENT

Configuration management will not be implemented on the SWL/FTF project since it does not apply to these Performance Grade 4 and 5 facilities.

7.3 CONSTRUCTION MANAGEMENT

Fluor Fernald Construction (Construction) is responsible for implementing and managing this remedial action project in accordance with DOE direction. Construction will directly perform the remediation work through the use of building trades labor working directly for Construction or, to a much lesser extent, through the use of the site construction support contractor where appropriate. Construction management includes, but is not limited to, conducting status meetings, daily work surveillance and inspections, and daily safety tours and oversight of the project. The Execution Manager or designee will ensure that safety concerns are brought to the attention of the FEMP S&H Officer and the responsible Construction team members to ensure timely resolution of the concerns.

7.3.1 Status Meetings

The Execution Manager or designee will conduct regularly scheduled status meetings with the Engineering/Planning Manager, Engineering, Health and Safety, QA/QC, and others, as warranted. The meetings will address action item status, project progress, planning, schedule status, safety items, quality, environmental protection, and problem resolution.

Construction supervision will prepare a daily report (or log) covering the previous day's work status and identifying any safety or quality problems encountered. This report and any supplementary reports will ultimately be retained in the FEMP project file.

7.3.2 Surveillance and Inspection

Construction supervision has first line responsibility to inspect work and correct any deficiencies. The Execution Manager, Engineering/Planning Manager or their designee(s) will conduct inspections and surveillances to ensure the design is being properly implemented and contract requirements are being satisfied. QC inspections will be in accordance with the Construction QA Plan and design requirements. If a deficiency is noted, then Construction will implement the necessary corrective action(s) as soon as possible.

7.3.3 Safety and Health Oversight

The SDFP S&H Manager or designee will perform safety oversight of the SWL/FTF construction. While FEMP personnel are responsible for following safety requirements identified in the Traveler Package, as appropriate, the assigned SWL/FTF S&H representative will perform periodic surveillance of the SWL/FTF remedial action to monitor compliance. Although project personnel have stop-work authority for imminent safety hazards, the S&H representative will have stop-work authority (in the event of a threat to worker and/or public safety) until the proper corrective follow-up actions are taken. The S&H representative will be the single point of contact for safety, industrial hygiene, and fire protection issues.

7.3.4 Radiological Monitoring and Oversight

The Radiological Engineer is responsible for radiological concerns. S&H issues and concerns will be directed to the Execution Manager for resolution/implementation. FEMP RCTs assigned to the project will perform the necessary radiological monitoring and oversight to provide documentation demonstrating project compliance with regulatory occupational exposure control requirements. The CT will be the basis for the required project occupational radiological monitoring and it will identify action levels to ensure personnel radiological safety, as well as industrial/occupational safety.

7.4 IMPACTED MATERIAL MANAGEMENT

Impacted materials generated during SWL/FTF remediation will be managed under the FEMP Waste Disposition Program, which is implemented as an integrated effort by WAO, waste programs, and construction organizations. Roles and responsibilities for each of these organizations are established in procedure EW-1022, On Site Tracking and Manifesting of Impacted Material.

Programmatic controls begin with waste planning during the predesign phase, at which time a volume estimate for each waste type (e.g., exceeds OSDF WAC, special materials, RCRA, etc.) is prepared, characterization methods are specified, and tentative interim (if required) and final means of disposal are identified. During project execution, waste streams are segregated by disposition categories and managed in the context of the following characterization, storage, and disposal options:

- Bulk Waste Streams: On-Site Disposition
  - Physical matrix allows bulk management
  - Meets the OSDF chemical, radiological, and physical WAC
- Bulk Waste Streams: Off-site Disposition
  - Physical matrix allows bulk management
  - Exceeds the OSDF radionuclide WAC (rail transport)
  - Exceeds the OSDF chemical WAC (truck transport)
- Containerized Waste Streams: Off-site Disposition
  - Exceeds OSDF chemical, radiological or physical WAC
  - Cannot be processed to meet OSDF WAC
- Containerized Waste Streams: On-Site Disposition
  - Physical matrix or nature of waste does not allow bulk management
  - Requires processing in a controlled area to meet OSDF WAC
  - Requires confirmatory sampling for OSDF WAC
  - Special Material that meets the OSDF WAC, but requires special handling for S&H concerns.

Bulk waste stream information will be managed in the Integrated Information Management Systems (IIMS) database. Anticipated impacted material segregation protocols are listed in Technical Specification Section 02205. The relationship between IIMS and other site databases is illustrated on Figure 3-9 in the SEP. IIMS is designed to accommodate fast track, bulk waste stream characterization, OSDF WAC attainment demonstration, and OSDF manifesting by using site characterization data. It interfaces with the SED through the State of Ohio NAD 83 coordinate system to track historical RI/FS and newly generated data with the excavated material moved from the source location. It also interfaces with the Sitewide Waste Information Forecasting and Tracking System (SWIFTS) to allow electronic transfer of bulk waste inventory to the container management system, when containerization is required.

Field information for input to IIMS will be collected on FTLs and OSDF Manifests, with information subsequently entered into IIMS. Key data elements that are recorded on these forms are listed below:

- Project number and name
- Source MTL
- Interim or final disposition MTL (FTL only)
- Estimated volume of material
- Material matrix or profile number
- Generation date
- Signature.

Copies of FTLs and OSDF Manifests are kept in the project files.

MTLs are defined electronically in IIMS using the State of Ohio NAD 83 coordinate system. Before project start-up, SED data are reviewed and contiguous areas with like data are identified as unique MTLs. MTLs are identified on project drawings and in the field. When data from an FTL log is entered to IIMS, SED data for the specified MTL is tied to excavated soil volumes that have been moved to either an interim (pre-remediation area, stockpile, or container) or final (OSDF disposal) location. IIMS maintains transaction histories to provide cumulative analytical data for soil volumes that are moved more than one time. The main types of MTLs include WAC attainment areas, stockpiles and the OSDF.

A root profile is assigned to each of the five primary waste streams designated for OSDF disposal:

Profile # 91,000 OSDF Category 1	Soil and soil-like material
Profile # 92,000 OSDF Category 2	Debris for en masse placement
Profile # 93,000 OSDF Category 3	Debris for individual placement
Profile # 94,000 OSDF Category 4	High organic content (such as vegetation)
Profile # 95,000 OSDF Category 5	Friable asbestos-containing material, sludges, and materials requiring case-by-case approval

The waste profile number facilitates electronic information retrieval from IIMS. Numeric extensions (e.g., 91,001...95,999) are used for further waste stream delineation on an as-needed basis. The second digit of the profile number identifies the OSDF category. Wastes manifested to the OSDF will be

covered under a waste stream profile. The manifest number is used to retrieve characterization information from IIMS, if required, to support a determination that the waste meets WAC.

7.5 CONTINGENCY MANAGEMENT

Conditions that are unexpected cannot be managed through established excavation guidelines, and they are not accommodated in the detailed remedial design. These conditions will be dealt with according to contingency management protocols and plans set forth in Appendix F of the SEP. The contingencies are categorized as follows:

- Unearthing of materials that require special handling (e.g., asbestos)
- Encountering contamination or soil conditions that may pose a risk to human health or the environment if standard excavation practices are used (e.g., process residues), or which are significantly different than expected, or which may affect other operations
- Discovering unexpected utilities or cultural/historic resources.

7.5.1 Materials Which Require Special Handling

The protocol for handling special materials is provided in Appendix F of the SEP and procedure EW-1024. The special materials that might be encountered during SWL/FTF excavation activities include asbestos-containing materials, acid brick, piping, and miscellaneous debris. Some special materials may meet OSDF WAC, while others will require off-site shipment. The SDFP and WAO will provide assistance to FEMP Construction for field decisions related to the management and disposition of special materials. If applicable, WAO will arrange for movement of materials to the appropriate storage and handling areas for characterization, treatment evaluation, and/or final disposition arrangements. Additional details are provided in Technical Specification Section 02205.

7.5.2 Unexpected Contamination or Soil Conditions

In accordance with the SEP, the FEMP design change process will be used to effect design changes in cases where conditions and design changes do not differ significantly from the approved IRDP. If conditions are significantly different than the approved IRDP design, than one of the following options will be exercised:

- Revise the IRDP design within SEP guidelines, submit a letter to regulatory agencies describing the design revision, and proceed with excavation

- Stop work at the boundary of the problem condition, and address the continued excavation in a subsequent IRDP

- Discuss optional approaches with the regulatory agencies to determine if the area must be addressed as an exception to SEP guidelines.

Table 7-1 addresses the specific situations relative to discovery of unknown underground utilities and unexpected above-WAC material.

7.5.3 Unexpected Discovery of Cultural or Historic Resources

If cultural resources are discovered, then the contingency plan described in Appendix F of the SEP and procedure EP-0003 will be implemented. Construction personnel will be trained to the plan and must recognize a potential cultural resource when encountered. Personnel will ensure safe handling of the resources by isolating the affected area until an on-call specialty contractor can perform any necessary data recovery. The specialty contractor is required to be on site within four hours. DOE will consult with the appropriate parties (e.g., OHPO, pursuant to 36 CFR Part 800) to determine a course of action that will avoid and minimize any adverse impacts to the extent practical. If human remains, associated funerary objects, unassociated funerary objects, sacred objects, or objects of cultural patrimony are discovered, the appropriate Native American tribe(s) will be consulted. During the consultation, DOE will cease activity in the immediate area and make a reasonable attempt to secure the remains and/or objects. Construction work stoppages in the immediate area could last a minimum of 30 days.

7.6 DATA AND RECORDS MANAGEMENT

Management of data and records for SWL/FTF remediation will be in general accord with the strategy and protocols as described in Section 3.6 of the SEP and the quality assurance protocols for data management activities described in Appendix E of the SEP. The primary documents that will be generated during SWL/FTF remediation, and the files in which they will be maintained, are identified in Table 7-2.

7.7 QA/QC AND REGULATORY AUDIT

SWL/FTF project activities will be assessed to verify compliance to program requirements specified in this Implementation Plan. The assessment will include audits, surveillances and inspections commensurate to the scope and level of verification needed for the field tasks, contract execution, and programmatic implementation of driver documents. QA programmatic drivers are the DOE-approved

FEMP QA Plan (RM-0012), the EPA-approved SCQ, and Appendix E of the SEP Quality Assurance Project Plan.

The applicable quality requirements will be specified in project-planning documents. These documents include Data Quality Objectives and PSPs that serve as planning and field instructions for environmental real-time and physical sampling activities. Additionally, the engineering design packages will include the necessary QC to assure conformance to design specifications. The FEMP QA Plan (RM-0012) describes the appropriate QA requirements for the self-performed construction. Other documents that require QA review and concurrence are procedures and purchase requisitions.

The SDFP QA/QC Manager will coordinate project QA/QC oversight through audits, surveillances, inspections, vendor surveys, and other internal assessments needed to verify quality issues associated with the IRDP activities. External assessments from the FEMP will also be coordinated with the SDFP QA/QC Manager. Construction will be responsible for documenting field inspections, nonconformance identification, and corrective actions in a timely and controlled manner.

The DOE-FEMP, EPA, and OEPA have access to IRDP field activities, planning documents, and databases as necessary to assess and verify IRDP implementation. The OEPA has FEMP oversight responsibility for NPDES, RCRA, dust and noise control, ground water monitoring, air and water pathways, and related split-sampling programs.

FEMP procurement requisitions are reviewed and signed by the SDFP QA/QC Manager. The SWL/FTF QA/QC representative will identify material receipt requirements and the frequency of vendor source inspections, as necessary. Nonconforming items will be tagged and stored as unacceptable until corrective measures are determined.

7.8 INTEGRATION OF SWL/FTF PROJECT WITH OTHER SDFP AND FEMP ACTIVITIES

SWL/FTF remediation activities are planned and conducted in cooperation with other SDFP and FEMP remediation projects and activities to ensure effective and efficient attainment of project-specific and sitewide remediation objectives. The integration with FEMP support groups is established through functional support representatives that are integral members of the SWL/FTF Project team (e.g., environmental compliance, natural and cultural resource management, sampling and analysis, QA,

construction management). As noted in Section 7.1, the Engineering/Planning Manager and Execution Manager are responsible for ensuring that coordination is established and maintained with other projects and support groups, and the Project and Construction Engineers are responsible for implementing this coordination on a day-to-day basis. Key interfaces with other SDFP and FEMP organizations not directly represented on the SWL/FTF Project Team include the following:

- Sitewide Planning and Scheduling
  - Integrating the SWL/FTF plan and schedule with the FEMP master schedule
- OSDF Project
  - Planning and scheduling activities to ensure timely placement of SWL and FTF impacted material into the OSDF in accordance with the Impacted Materials Placement Plan and other pertinent requirements
- Demolition Projects
  - Coordinating above-grade demolition of SWL/FTF components with at- and below-grade remediation of these facilities by SDFP under this Implementation Plan
- Aquifer Restoration and Wastewater Projects
  - Treatment of storm water and perched water collected and managed from the excavation through Phase I or Phase II of the AWWT system
  - Assessing potential adverse effects on the Great Miami Aquifer from deep excavations, if appropriate, and designing and implementing measures to ensure protectiveness
- Site Utilities
  - Coordinating installation of electrical power supply and communications lines to SWL/FTF Support Area and Radiological Control Point Facility
  - Coordinating as necessary to remove, replace, or relocate other utilities

- WAO

  - WAO, an FEMP organization independent of both the soil- and debris-generating projects and the receiving OSDF project, has programmatic responsibility for the OSDF WAC attainment compliance assurance program presented in the WAC Attainment Plan. WAO representatives will provide oversight of field activities from the origin of excavated impacted material to OSDF receipt

- FEMP Real Estate Office

  - Coordinating to obtain cooperation of Cincinnati Gas and Electric on matters potentially affecting their utility facilities or areas within easements for these facilities

  - Coordinating to secure agreement for off-property remedial activities, if necessary (e.g., off-property impacted area sampling and excavation).

7.9 REMEDIAL ACTION AND CERTIFICATION SCHEDULE

In accordance with the Amended Consent Agreement, this Implementation Plan identifies SWL/FTF project-specific milestones for remedial actions and certification activities (Table 7-3). These milestones are subject to enforceable deadlines by EPA and OEPA.

TABLE 7-1
CONTINGENCY PLANS FOR RECOGNIZED BUT UNEXPECTED CONDITIONS

Condition	Contingency Plan
Discovery of unexpected underground utilities	Stop work in the area. Coordinate with Site Utilities and, if appropriate, non-DOE utility owner to determine utility location information, jurisdiction, operational status, necessary safe shutdown requirements (e.g., electrical de-energizing, gas pipeline capping and purging), and remediation options. Revise the design within SEP guidelines and protocols described in this Implementation Plan for known utilities. Submit a letter to regulatory agencies describing the design revision, and proceed with excavation.
Discovery of above-WAC material outside of areas designated for excavation in the IRDP	Prepare options for remediation. If the design would conform to SEP guidelines, submit letter describing investigation plans, design changes, and schedule implications to the regulatory agencies, complete design, and proceed. Otherwise, discuss optional approaches with the regulatory agencies to determine if the area must be addressed as an exception to guidelines.

TABLE 7-2
SWL/FTF PRIMARY RECORDS AND ASSOCIATED FILES

Document	File *
Construction drawings, Technical Specifications and Associated Field Logs	IIMS GIS Component ECDC
Miscellaneous Field Logs	ECDC
Manifest-type Documents	IIMS SWIFTS Component ECDC
Containerized Impacted Material Documents	IIMS SWIFTS Component Site Operating Record
Analytical Data and Associated Field Logs	IIMS SED Component ECDC

GIS = Geographic Information System

TABLE 7-3
SWL/FTF REMEDIAL ACTION AND CERTIFICATION SCHEDULE

Remedial Action Areas	Submit Implementation Plan	Complete CFC Package *	Begin Remedial Action	Complete Remedial Action **	Submit CDL to Regulators	Submit Certification Report to Regulators
SWL/FTF	8/30/02	9/26/02	9/30/02	12/13/02	2/18/03	8/19/03

* CFC Package completion is dependent on timely completion of SWL slope stability analysis without design impact.

** Remedial Action finish date is dependent on availability of adequate air space in OSDF Cell 3.

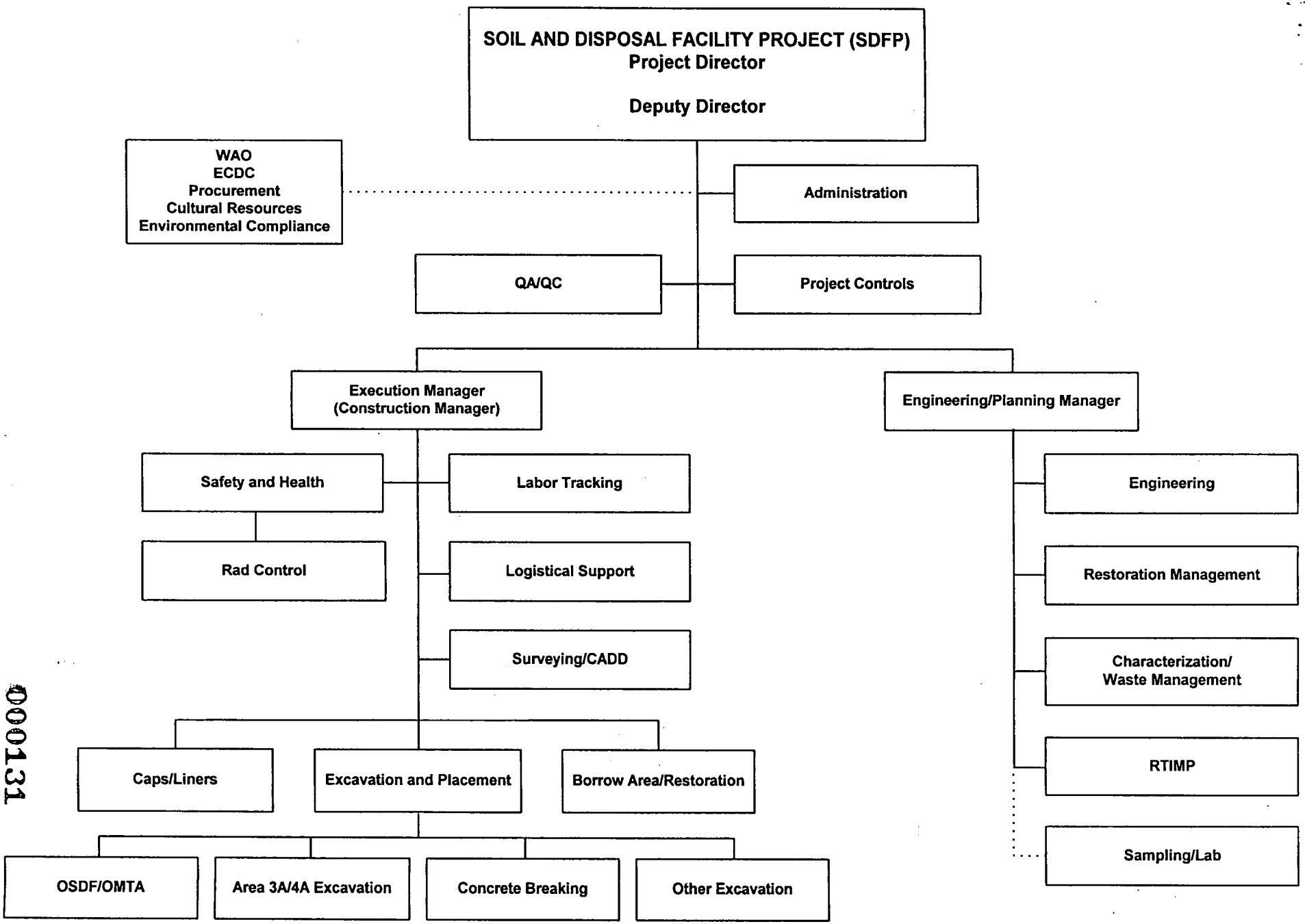


FIGURE 7-1 ORGANIZATIONAL CHART FOR THE SWL/FTF PROJECT

REFERENCES

U.S. Department of Energy, 1994, "OU3 Interim Record of Decision for Remedial Actions and Responsiveness Summary," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1995, "Record of Decision for Remedial Actions at Operable Unit 2," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1996a, "Record of Decision for Remedial Actions at Operable Unit 3," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1996b, "Record of Decision for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1996c, "Remedial Design Work Plan for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998a, "Sitewide Excavation Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998b, "Waste Acceptance Criteria Attainment Plan for the On-Site Disposal Facility," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998c, "Geotechnical Engineering Report for Project Order 177, A-E Support Services for Geotechnical Investigation of the Former Plant Area," Draft, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2001a, "Integrated Environmental Monitoring Plan," Revision 2, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2001b, "Project Specific Plan for Sampling of Miscellaneous Areas for OSDF WAC Attainment," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2001c, "Impacted Materials Placement Plan," Revision 3 PCN 1, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2002a, "Natural Resource Restoration Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2002b, "Project Specific Plan for Predesign Investigation Sampling in the Solid Waste Landfill and the Fire Training Facility," Revision 0, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Environmental Protection Agency, 1991, Consent Agreement as Amended under CERCLA Sections 120 and 106(a), in the matter of U.S. Department of Energy, Feed Materials Production Center, Fernald, Ohio, U.S. EPA Region V.

APPENDIX A

DESIGN CRITERIA PACKAGE

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DESIGN CRITERIA PACKAGE FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

MAY 2002

20201-DC-0001
REVISION 4A

000135

DESIGN CRITERIA PACKAGE FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

20201-DC-0001
REVISION 4A

APPROVALS:

Christopher R. Neumann, Project Engineer Soil and Disposal Facility Project	Date
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REVISION SUMMARY

Revision	Date	Description of Revision
Rev. 0	10 March 1999	Initial issuance of the Design Criteria Package for the At- and Below-Grade Remediation of the Former Plant Area
Rev. 1	26 January 2000	Refined Approvals page
		Revised Figure 5-1
		Revised design storm and water release requirements for surface water management
		Clarified perched water management narrative
Rev. 2	31 March 2000	Added Revision Summary page
		Noted characterization criteria for 3-D computer excavation model
		Renamed Figure 5-1
		Added Figure 5-2
		Clarified applicability of ODNR requirements for surface water management
		Refined Options 1 and 2 for perched water management
		Clarified characterization of stockpiles
		Refined intended transportation routes
		Revised interim restoration criteria
Rev. 3	March 2001	Added title of Rainwater and Land Development in Sections 4.0 and 5.4
		Deleted references to Water Management Facility and Biodentrification Surge Lagoon
		Clarified disposition of VOC-contaminated water

REVISION SUMMARY (Continued)

Revision	Date	Description of Revision
		Clarified disposition of surface water from certified area
		Revised traffic requirements
Rev. 4A	April 2002	Revised Approvals page
		Added Area 6 (including General Area, Former Pit Area, Former Production Area, the Solid Waste Landfill, and Fire Training Facility) and Area 2, Phase II areas to be included under the scope of this document
		Deleted references to A/E subcontractor and construction contractor and replaced with Soil and Disposal Facility Project Engineering Group and Soil and Disposal Facility Project Construction Group
		Replaced Figure 5-1
		Deleted Figure 5-2
		Added alternative to pump water requiring AWWT Phase II treatment through temporary HDPE piping

DESIGN CRITERIA PACKAGE FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

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LIST OF ACRONYMS AND ABBREVIATIONS

A/E	Architect/Engineer
ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirements
ASCE	American Society of Civil Engineers
ASCOC	area-specific constituent of concern
AWWT	Advanced Waste Water Treatment (facility)
BAT	best available technology
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	*Code of Federal Regulations*
COC	constituents of concern
DAC	derived air concentration
DCP	Design Criteria Package
DOE	U S. Department of Energy
EPA	U. S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FRL	final remediation level
FTF	Fire Training Facility
GMA	Great Miami Aquifer
gpm	gallons per minute
HWMU	hazardous waste management unit
NAD	North American Datum
NOAA	National Oceanic and Atmospheric Administration
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act of 1976
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SCS	Soil Conservation Service
SEP	Sitewide Excavation Plan
SWL	Solid Waste Landfill
SWRB	Storm Water Retention Basin
TBC	to be considered
USGS	U.S. Geologic Survey
WAC	waste acceptance criteria
WPM	Waste Programs Management

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DESIGN CRITERIA PACKAGE FOR THE AT- AND BELOW-GRADE REMEDIATION OF THE FORMER PLANT AREA

1.0 Scope

The purpose of this Design Criteria Package (DCP) is to assemble the specific criteria and assumptions for the at- and below-grade remediation of the Former Plant Area of the Fernald Environmental Management Project (FEMP). The Former Plant Area is comprised of the Former Production Area (Areas 3A, 3B, 4A, and 4B) and the Administration Area (Area 5), and for the scope of this document, shall include Area 6 (including General Area, Former Waste Pit Area, outlying areas of the Former Production Area, Solid Waste Landfill (SWL) and Fire Training Facility (FTF)), and Area 2, Phase II. Comprehensive development of design criteria relating specifically to the project requirements is conducive to orderly and accurate development of preliminary and definitive designs.

The remediation objective for the Former Plant Area is to excavate and remove impacted material, including contaminated soil, perched groundwater, at- and below-grade man-made structures (such as pavements, building foundations, basements, debris, and underground utilities, with the possible exception of pile foundations driven below contaminated depths), residual above-grade man-made structures (such as utility poles, fire hydrants, equipment foundations, and bollards), and soil-like containerized materials remaining after Operable Unit (OU) 3 demolition activities. Impacted material will be transported for placement in the On-Site Disposal Facility (OSDF), temporarily staged for bulk shipment off site, or containerized for on-site or off-site treatment, depending on attainment of OSDF waste acceptance criteria (WAC). Remediation will be sequenced and integrated with other projects near the subject remediation area. Project documents to be prepared subsequent to this DCP will be written with the goal of achieving this remediation objective.

Also included in the scope of this DCP is the design of support facilities such as personnel and equipment decontamination areas, construction support areas, packaging, material stockpiles, surface water management, erosion and sediment control facilities, and all other facilities (including utilities) necessary to excavate and handle impacted material with the intent of mitigating effects to human health and the environment.

2.0 Comprehensive Design Requirements

The overall remediation objective for the Former Plant Area is to excavate, remove, and dispose all impacted material. Based on constituents of concern (COCs), levels of contamination, and the ability to meet OSDF WAC, impacted materials will be placed at the OSDF, temporarily staged before placement at OSDF, shipped to an appropriate off-site disposal facility, or containerized for on-site or off-site treatment. Impacted material includes soil, man-made structures, and other material with contaminant concentrations above the final remediation levels (FRLs). This presents the comprehensive design requirements necessary to achieve technical, health and safety, and environmental objectives. Project specific requirements are presented in Section 5.0 of this DCP.

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2.1 Technical Requirements

The Soil and Disposal Facility Project (SDFP) Engineering Group will prepare technical Title I and Title II design documents for remediation of the Former Plant Area. These documents will include construction drawings, specifications, and other documents that clearly describe requirements and general procedures of the proposed remediation. The SDFP Engineering Group will utilize all available reports and plans that summarize previous investigations of the area (e.g., environmental analyses and geotechnical data). The SDFP Construction Group will use these design documents to implement the excavation activities after U. S. Department of Energy (DOE), U. S. Environmental Protection Agency (EPA), and Ohio Environmental Protection Agency (OEPA) approval.

The design will address the following technical requirements:

- Excavation Criteria and Objectives - Excavation criteria and objectives to remediate impacted materials will be developed and presented in design documents. The criteria in design documents will be performance-oriented. The SDFP Construction Group will develop specific excavation methodologies. Design drawings must clearly show the estimated limit of excavation based on analytical and geotechnical data, environmental and stratigraphic modeling, and other appropriate information.
- Excavation Requirements - Impacted material will be excavated as efficiently as possible. As stated above, design drawings will clearly show the estimated limit of excavation. Further, perched groundwater zones encountered during excavation will be excavated with the contaminated soil. Design documents will present a general methodology to excavate impacted material, as well as procedures to minimize potential impacts to the underlying Great Miami Aquifer (GMA) during excavation.
- Flexibility - The design effort will prepare documents that can adjust to actual field conditions encountered during remediation (i.e. contingency will be built into the design). Further, the design will be developed as a phased excavation approach with contingency noted to ensure that cost-saving measures, enhanced excavation techniques, and identified problems are incorporated.
- Consistent with Final Land Use – The primary focus of restoration activities will be to establish a system of wetland and open water habitats with supporting woodlands and grasslands to support a diverse natural system. Design plans will be integrated with this final land use plan.
- Contingency Plans - Contingency plans for encountering unexpected material, structures, or utilities will be developed during design activities. Also, contingency plans will be developed for adverse weather conditions, seasonal shutdowns, as well as due regard for existing and/or ongoing remedial operations.

2.2 Safety and Health Requirements

The design will incorporate engineered safety controls/measures specific to the work scope to promote safe execution of the project.

Radiologically contaminated soil and other material can become airborne during excavation and material transportation. Dust suppression methods that implement the best available technology

(BAT) will be used to control airborne emissions in accordance with FEMP procedure RM-0047, Fugitive Dust Control Requirements. Monitoring for airborne radioactive particles will be performed by Fluor Fernald during excavation activities.

Title 10 *Code of Federal Regulations* (CFR) 835.1002 requires that airborne particles are controlled and inhalation of such material by workers is kept to levels as low as reasonably achievable (ALARA). Therefore, activities that increase worker exposure, such as eating, drinking, and smoking, will not be permitted in any radiologically controlled work area. Requirements for respirators will be determined on a task-specific basis, considering the environmental conditions.

Applicable worker safety and health requirements will apply to this project. This includes the requirement that site workers have Hazardous Waste Operations and Emergency Response training in accordance with 29 CFR 1910.120. Exposure rate goals for radiological workers are identified in Section 5.0 of this DCP.

2.3 Environmental Requirements

Remediation of the Former Plant Area is part of the FEMP sitewide environmental remediation. Therefore, the remedial design will address protection of the environment during construction and improvement of the environment at the completion of remedial activities.

Environmental considerations include using existing data to develop a computer model of the estimated limit of excavation; evaluating and analyzing site geology, perched groundwater, and surface water flow characteristics; and incorporating regulatory requirements into the design.

Collection and transfer of perched groundwater and subsequent treatment of that water at the Advanced Waste Water Treatment (AWWT) facility will be addressed during design. Similar technical approaches to stormwater run-on/runoff and erosion and sediment control will be addressed in the design.

2.4 Utility Requirements

Consideration will be given to utilities required to support FEMP remedial actions. Design documents will address utility relocation and/or decommissioning. Energy source utilities entering or exiting the remediation area will be identified during design. Utility services required during remediation activities will be included in the design. Precautions and reporting requirements for potentially unidentified utilities will be included in design documents and project permitting.

3.0 ARARs and TBCs

The remediation design of the Former Plant Area will conform to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) § 121(d)(2), which requires that remedial actions protect human health and the environment while complying with applicable or relevant and appropriate requirements (ARARs). To be considered (TBC) criteria will also be evaluated as part of design activities. This includes nonpromulgated criteria,

advisories, and guidance issued by federal and state governments that may or may not be legally binding.

Pertinent ARARs and TBCs for the sitewide soil remediation effort are included in the Sitewide Excavation Plan (SEP). These ARARs and TBCs for at- and below-grade remediation of the Former Plant Area have been reissued and are appended to this document (Tables A-1 and A-2 in Appendix A).

4.0 Regulations, Codes, Standards, Orders, Manuals, and Guides

This document contains references to general regulations, codes, standards, orders, manuals, and guides that apply to Title I and Title II design work. Requirements listed in the latest edition of each of the following documents will apply, unless otherwise noted.

American Society of Civil Engineers (ASCE)

- ASCE 77 — Design and Construction of Urban Stormwater Management Systems

Code of Federal Regulations (CFR)

- 10 CFR 835 — Occupational Radiation Protection
- 10 CFR 1022 — Compliance with Floodplains/Wetlands Environmental Review Requirements
- 29 CFR 1910 — Occupational Safety and Health Standards
- 29 CFR 1926 — Safety and Health Regulations for Construction
- 40 CFR 122 — EPA Administered Permit Program: The National Pollutant Discharge Elimination System (NPDES)
- 40 CFR 125 — Criteria and Standards for the NPDES
- 40 CFR 192 — Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings
- 40 CFR 240 — Guidelines for the Thermal Processing of Solid Wastes
- 40 CFR 256 — Guidelines for Development and Implementation of State Solid Waste Management Plans
- 40 CFR 260 — Hazardous Waste Management System: General
- 40 CFR 261 — Identification and Listing of Hazardous Wastes
- 40 CFR 262 — Standards Applicable to Generators of Hazardous Wastes
- 40 CFR 263 — Standards Applicable to Transporters of Hazardous Wastes
- 40 CFR 264 — Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- 40 CFR 265 — Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

Fluor Fernald Procedures

- ED-12-2007 ALARA Review
- ED-12-3001 Engineering Design Initiation
- ED-12-3002 Collection, Verification, and Use of Engineering Data
- ED-12-4004 Design Package
- ED-12-4005 Calculation Preparation and Review Process
- ED-12-4006 Specifications Preparation and Issue
- ED-12-4007 Drawing Preparation and Issue
- FD-1000 Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- NS-0003 Safety Assessment Hazard Screening and Classification
- RM-0012 Quality Assurance Program
- RM-0039 Storm Water Pollution Prevention Plan
- RM-0047 Fugitive Dust Control Requirements

National Oceanic and Atmospheric Administration (NOAA)

- NOAA/TP40 Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from One to 100 Years

Ohio Administrative Code (OAC)

- OAC 4101 Ohio Basic Building Code and Related Codes

Ohio Department of Natural Resources (ODNR)

- ODNR Rainwater and Land Development, Ohio's Standards for Stormwater Management Land Development and Urban Stream Protection, Second Edition, 1996

Ohio Department of Transportation (ODOT)

- ODOT Construction and Material Specifications

Ohio Environmental Protection Agency (OEPA)

- OEPA Stormwater Pollution Prevention Plan Checklist

Soil Conservation Service (SCS), U. S. Department of Agriculture

- TR55 Urban Hydrology for Small Watersheds

U. S. Department of Energy (DOE)

- DOE 5480.19 Conduct of Operations
- DOE 5480.23 Nuclear Safety Analysis Reports
- DOE-STD-1021 Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components

U.S. Geologic Survey (USGS)

- 1983 NAD Ohio State Plane Coordinate System South, Zone 3402

The following are the primary reference documents that apply to the design of the at- and below-grade remediation of the Former Plant Area. Copies of these documents will be readily available to design personnel.

- Sitewide Excavation Plan, 2500-WP-0028, Revision 0, July 1998
- National Pollutant Discharge Elimination System Permit, Ohio EPA Permit Number 1IO00004*ED, September 27, 1995
- Functional Requirements Document for the Former Plant Area, 20300-PL-0003, Revision 2, February 2002
- Advanced Conceptual Design, 20201-PL-0002, Revision 0, 24 May 1999

The following are secondary reference documents that apply to the design of at- or below-grade remediation of the Former Plant Area. Copies of these documents will be readily available to design personnel.

- Geotechnical Sampling and Testing Plan of the Former Plant Area, Revision 0, April 1997
- Geotechnical Engineering Report for Project Order 177, A-E Support Services for Geotechnical Investigation of the Former Plant Area, 20800-RP-0001, Revision C, March 1998
- Impacted Materials Placement Plan On-Site Disposal Facility, 20100-PL-007, Revision 3, October 2001
- Waste Acceptance Criteria Attainment Plan for the On-Site Disposal Facility, 20100-PL-0014, Revision 0, June 1998
- Natural Resource Impact Assessment and Natural Resource Restoration Plan, 20300-RP-0002, Revision D, 212E-PL-0003, Revision E, July 1998
- Strategic Utilities Plan Summary, Final, 1996
- 1997 Integrated Site Environmental Report, 51350-RP-0001, June 1998

The following are tertiary reference documents that apply to the design of at- and below-grade remediation of the Former Plant Area. Copies of these documents will be available to design personnel.

- OU3 Remedial Investigation and Feasibility Study Report (4 volumes), February 1996
- OU3 Record of Decision for Final Remedial Actions, August 1996
- OU5 Remedial Investigation Report (18 volumes), March 1995
- OU5 Feasibility Study Report (3 volumes), June 1995
- OU5 Record of Decision for Final Remedial Actions, January 1996
- OU2 Remedial Investigation Report, 1995
- OU2 Feasibility Study Report, 1995
- OU2 Record of Decision for Final Remedial Actions, 1995
- Utility Design Reconstitution (Parsons PO 141)
- WPRAP Remediation System Design, 10100 (Parsons PO 145)

- Rerouted North Entrance Road, 20120 (Parsons PO 145/158)
- Site Preparation and Underground Utilities, 40310 (Parsons PO 146)
- Southern Waste Units, 20400 (Parsons PO 165)
- Paddys Run Trestle Upgrade, 10200 (Parsons PO 167, includes all OU1 Railroad Upgrades and Additions)
- Closeout Package Report for Area 3 Remedial Design Services, 20810-RP-0003, Revision 0, November 1997 (Parsons PO 180)
- On-Site Disposal Facility Design, 20100
- Borrow Source Evaluation for Fill of the Deep Area 3 Excavations Located Near the On-Site Disposal Facility, 20810-RP-0001, August 1997

5.0 Project Specific Requirements

This section addresses primary and general deliverable requirements for Title I and Title II design as applied in Fluor Fernald engineering procedures. This DCP will be used to govern both Title I and Title II design efforts for at- and below-grade remediation of the Former Plant Area.

Title I design generally includes, but is not limited to the following:

- Definition of project design criteria to meet project specific ARARs/TBCs and establishment of quality levels for systems, structures, and components
- Expansion of conceptual design drawings in greater detail or development of new drawings based on new design concepts (including locating and sizing structures, systems, and components)
- Development of an outline of technical specifications
- Development of conceptual-level technical approaches to address health, safety, and environmental protection requirements
- Development of preliminary cost estimates

Title II design typically advances the preliminary design developed in Title I engineering and planning to a level suitable for construction. Title II design generally includes the following:

- Preparation of final working drawings, specifications and implementation plans
- Development of bidding documents, as required
- Finalization of cost estimates
- Project coordination of all parties involved with the project
- Development of refined construction and procurement schedules

The Title I and Title II design documents will present information necessary to perform remediation activities. These documents will present the remediation plan and excavation sequencing, while allowing flexibility to make adjustments in the field based on actual conditions encountered. The documents will represent a practical approach based on lessons learned from other projects completed and currently underway on site.

The documents will present specific functional requirements in the following areas:

- Utility Isolation Requirements
- Excavation Requirements
- Sequencing Within and Between Remediation Areas 3A, 3B, 4A, 4B, 5, SWL, FTF, A2PII, 6 (General Area, Former Pit Area, and Former Production Area)
- Impacted Material Management
- Surface Water Management
- Perched Water Management
- Equipment and Personnel Decontamination
- Environmental Monitoring and Sampling
- Certification
- Predesign Sampling Requirements to Support Design
- Sampling Requirements for Containerized Soil-Like Materials
- Transportation
- Interim Restoration

5.1 Excavation Requirements

Excavation will be performed to remove impacted material in the Former Plant Area. Excavation strategies have been set forth in the SEP. The slope limits for excavation will be no steeper than those recommended by Parsons in the Geotechnical Engineering Report for Project Order 177, A-E Support Services for Geotechnical Investigation of the Former Plant Area (20800-RP-0001). The maximum limit of 1.5H:1V slope with 15-foot wide benches every 13-feet vertically will govern design of excavation slopes. Design documents will be developed based on a 3-D computer model of the extent of excavation. The 3-D computer model included in the Advanced Conceptual Design (20201-PL-0002) will be modified and updated during Title I design to support the design effort. Three FRLs for total uranium - 20 mg/kg within high-leachability areas (see Figure 5-1), 82 mg/kg outside high-leachability areas, and 38.6 mg/kg within the SWL boundaries, will be used to develop the 3-D computer model for extent of excavation in accordance with the SEP. An additional ALARA goal of 50 mg/kg for total uranium will be reached if soil with uranium concentrations of 50 mg/kg or greater is within one lift thickness (3 $\pm$ 1 foot) of an area of soil exceeding the 82 mg/kg uranium FRL. The following types of impacted material will be addressed in the design:

- Soil with contaminant concentration levels above OSDF WAC (WAC for soil contaminants are listed in the SEP)
- Soil with area-specific constituents of concern (ASCOCs) above the FRL
- Soil with the potential to exhibit Resource Conservation and Recovery Act (RCRA) toxicity characteristics (as identified in the SEP)
- At- or below-grade man-made structures, debris, and utilities (with the possible exception of pile foundations driven below contaminated depths)
- Above-grade man-made structures remaining after OU3 demolition activities
- Fill material
- Contaminated and non-contaminated perched groundwater
- Encountered special materials (as defined in the SEP)

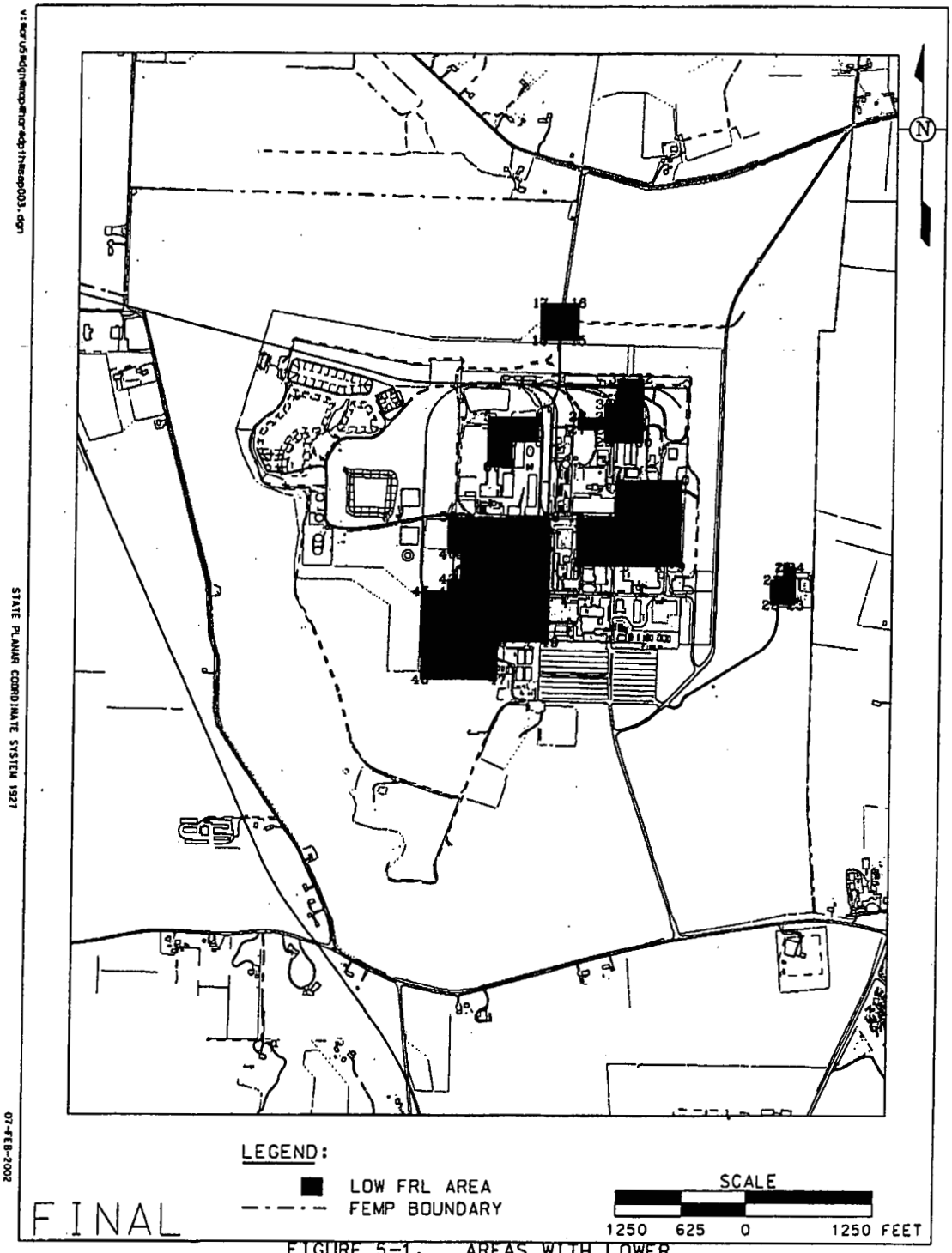

FIGURE 5-1. AREAS WITH LOWER URANIUM FRL DUE TO HIGH LEACHABILITY

- The design must identify locations and depths where elevated levels of contamination are known to exist.
- This will be done using the 3-D computer model to provide the preliminary extent of excavation based on total uranium concentrations in Areas 3A, 3B, 4A, and 4B.
- The top 2 feet of gravel and soil will be removed during the remediation of Areas 3A, 3B, 4A, 4B, 5 and 6 (Former Production Area).
- The top 6 inches of gravel and soil will be removed during the remediation of Area 6 (General Area).
- A minimum of 6 inches of soil will be removed following removal of gravel, asphalt, or concrete in areas altered by establishment of infrastructure facilities (i.e. trailer complex, parking lot, etc.) in Area 2, Phase II.
- When excavating for borrow material, the bottom of the excavation will be at least 5 feet above the unsaturated sand and gravel deposits of the GMA.
- Excavation must maximize OSDF Category 1 material, as defined in the OSDF Impacted Materials Placement Plan.

5.2 Sequencing Within and Between Remediation Areas

The Sitewide Sequencing Plan is summarized for areas within the Former Plant Area, as follows: Area 3A, Area 4A, Area 4B, Area 5, Area 3B, Area 6 General Area, Area 6 Former Waste Pits, and Area 6 Former Production Area. Area 2, Phase II, the SWL and the FTF excavations will be used as supplemental areas to ensure material needs for the OSDF are met.

Utilities must be sequenced into remediation areas to provide utility requirements for the SDFP Construction Group. The Utilities Integration Group will provide much of the required coordination, but it does not necessarily cover all of this project's specific needs. Specific utility systems that must be considered in this project include electric power, telecommunications, alarms, potable water, firewater, sanitary sewers, and storm sewers.

The 20A electrical substation east of Plant 1 pad is the designated tie in location for electrical power. Office facilities and dewatering pump stations will require electrical service. These are located on the periphery or within each remediation area.

5.3 Impacted Material Management

Impacted material excavated from the Former Plant Area will consist of radiologically contaminated soil and debris, RCRA waste, former HWMUs, USTs, and other material. Excavated material that meets on-site radiological, physical, and chemical WAC will be placed in the OSDF in accordance with the Impacted Materials Placement Plan. Material that fails to meet physical WAC may be size reduced to allow placement in the OSDF. Material that cannot be size reduced to meet on-site physical WAC will be transferred to temporary staging areas for shipment off site to a permitted and licensed disposal facility. Temporary staging areas will be designated by Fluor Fernald.

Impacted materials exceeding chemical WAC may be treated, according to the nature of the contaminant, material type, and regulatory requirements. Material that does not meet the chemical WAC will generally be transferred to temporary staging areas before off-site shipment

unless it can be treated to meet WAC. During design, the cost-effectiveness of treating materials to meet on-site chemical WAC versus off-site disposal will be evaluated.

Soil containing radiological constituents (e.g., uranium, technetium-99, etc.) above the WAC limits will be excavated and staged for off-site disposal. If soil in a RCRA area exhibits toxicity characteristics and overlaps with an area delineated as exceeding radiological WAC, the soil and any associated debris will be staged separately to await a decision by Fluor Fernald Waste Programs Management (WPM) on treatment and final off-site disposal options.

The amount of Category 1 material needed to place other OSDF material categories (e.g. concrete) is limited. Therefore, the design will maximize the amount of Category 1 (i.e., soil and soil-like material) being dispositioned to the OSDF, while attaining FRLs in a cost-effective manner.

5.4 Surface Water Management

A Surface Water Management Plan will be developed to address both stormwater and erosion and sediment control. The stormwater management component will address water storage within the project site from the 10-year, 24-hour storm event. Sitewide pump and retention capacities will be designed so that the following criteria are met.

- Draining and pumping water out of the excavation area will occur within 72 hours (3 days) after the event.
- The existing stormwater retention basin (SWRB), or any newly constructed retention basins, will not be redesigned.

Erosion and sediment control requirements will address construction, remediation, and long-term conditions. The surface water management system for each remedial area will be designed to meet the following requirements:

- Surface water runoff from disturbed and noncertified areas will be collected and managed.
- Surface water run-on will be diverted away from deep excavations.
- Surface water runoff not requiring AWWT Phase II wastewater treatment will be routed to the existing SWRB via the existing storm sewer system within the Former Plant Area.
- Surface water runoff requiring AWWT Phase II wastewater treatment will be pumped into portable tanks and transported to treatment by the Construction Manager or shall be pumped through temporary HDPE piping, based on the volume and most economical route.
- Surface water from disturbed areas will be sent through a sediment basin or shall pass through an engineered erosion control structure, such as silt fences and/or riprap check dams, to remove gross suspended solids prior to being released into the storm sewer system.
- Upon completion of remedial activities and certification of the remediated area, drainage of surface water from the certification buffer area will be collected and pumped outside of the remediated area. The capacity of ditches and culverts along the drainage route will be verified to ensure they can handle the additional flows without flooding adjacent areas and nearby roadways.
- Any new holding tanks will be nonmetallic and contain lifting lugs to ease transport.

- Any required secondary containment must be easily assembled and disassembled for reuse.

During design the following items will be evaluated:

- preventing or minimizing uncontaminated surface water run-on to disturbed areas; and
- removal of gross suspended solids

The stormwater and sediment control structures will be evaluated, selected, designed, and coordinated, as appropriate, to be consistent with the objectives set forth in Storm Water Pollution Prevention Plan (RM-0039), Rainwater and Land Development, Ohio's Standard for Stormwater Management Land Development and Urban Stream Protection, and sound engineering judgment. The standards set forth in ODNR will not be incorporated into the design of this project in areas where runoff from disturbed surfaces are either discharged into the existing storm sewer system for subsequent AWWT Phase I treatment or collected for AWWT Phase II treatment. The existing stormwater system will be used as much as possible; it may be rerouted but it will not be upgraded since it will be removed during the course of this project. Use of hay bales is not standard engineering practice at the site. Silt fences and/or riprap check dams will be utilized as the primary erosion control devices.

Stormwater calculations will be based on TR-55 or other commonly accepted stormwater design practices, where applicable. The usage of any other stormwater design practice must be documented in design calculations.

5.5 Perched Water Management

The evaluation and analysis of geology and groundwater flow characteristics will be incorporated into the design process. This information will be used to develop design and construction procedures and methods to minimize potential contamination of the GMA and remediated areas during remediation and construction. The design of perched groundwater extraction/removal will address slope stability and dewatering requirements of open excavations, particularly for excavations penetrating significant zones of coarse-grained materials.

The need for pretreatment of remediation-generated wastewater, before discharging water to the appropriate main treatment loop of the AWWT (i.e., Phase I and Phase II), will be evaluated during design using the AWWT wastewater acceptance guidelines; these guidelines are based on NPDES permit requirements and coordinated with the AWWT facility.

The AWWT capacity for water treatment is 600 gallons per minute (gpm) for Phase I and 300 gpm for Phase II. Surface water collected in remediation areas will be treated via the AWWT Phase I System. Excavation surface water collected with perched groundwater that contains volatile organic compounds will be pumped into portable tanks and transported to the AWWT or will be pumped through temporary HDPE piping to be treated via the Phase II treatment system.

The estimated volume of surface water requiring AWWT Phase II treatment will be included with the estimated volume of perched groundwater.

5.6 Equipment and Personnel Monitoring Decontamination

Radiological control point facilities will be constructed at the ingress/egress points in the designated support areas. Temporary decontamination facilities and/or radiological control point facilities from previous remediation work will be considered for use, when practical. Treated or uncontaminated groundwater will be used for dust control. Before releasing equipment or support materials from a radiological area to an off-site area, radiological control personnel will perform an unrestricted release survey. Decontamination will be performed, as necessary, to support the release of equipment and/or support materials off site.

Exposure levels for personnel performing remedial work associated with at- and below-grade structures in the Former Plant Area are expected to be well below 10 CFR 835 exposure limits. The ALARA process described in engineering procedure ED-12-2007, ALARA Review, will be implemented in a manner consistent with 10 CFR 835 requirements to ensure that personnel exposures are controlled at levels that are reasonably achievable. The goal for total effective dose equivalent is not to exceed 200 mrem/yr/person.

External exposure rates are expected to be well below 0.5 mrem/hr and will be routinely monitored throughout the performance of work on the project. Airborne radioactive material levels contributing to personnel internal exposures are not expected to exceed 4 derived air concentrations (DAC)-hrs/week/person. BAT will be used to minimize fugitive dust emissions and control airborne radioactive materials such that only administrative controls are necessary to maintain personnel internal exposures at levels consistent with ALARA. Occupational air sampling will be performed routinely throughout the project to evaluate airborne radioactive particles. The collected radiological data will be assessed to establish performance indicators that evaluate the remediation project against established goals.

A radiation protection program will be in place to manage and control exposure to operations involving radioactive materials. Surface contamination and airborne radioactivity levels will be monitored as the project progresses to ensure that occupational radiation hazards are minimized. Based on the nature of the work and the hazard present, the prescribed personal protective equipment (PPE) and controls will be correct and appropriate for the work being performed. Based on evaluation of the radiological survey data obtained during remedial activities, engineering and administrative controls will be adjusted as necessary.

5.7 Environmental Monitoring and Sampling

Environmental monitoring and sampling is not included in the scope of this document. However, sequencing of construction to include environmental monitoring and sampling will be incorporated into the detailed designs. This includes excavation control characterization, environmental radiological monitoring, and certification sampling that will be performed by Fluor Fernald. Fluor Fernald will provide oversight for the incorporation of environmental monitoring and sampling into the detailed design and the implementation of associated procedures. The two principal components of environmental monitoring and sampling (real time scanning and safety and health monitoring) are discussed in the SEP.

5.8 Certification

Between certified areas where deep remedial excavations have occurred and nonremediated/noncertified areas, transitional certification zones will be established that allow sufficient space for stable excavation slopes and run-on prevention systems. Transitional certification zones cannot be certified until the adjacent nonremediated areas are excavated. Because of this transitional requirement, the active remediation area within the Former Plant Area and its associated certification area will not cover exactly the same area. A certification area within the Former Plant Area will generally be smaller than and offset from its associated remediation area.

5.9 Predesign Sampling Requirements to Support Design

In each remediation area, the following predesign sampling and analytical efforts will be completed before the 90 percent submittal of the Title II design:

- Delineation of RCRA soil in areas designated as possessing the potential to contain RCRA constituents
- Radiological surveys, sampling, and analysis to establish surficial extent of above-WAC materials
- Footprint survey for identified hazardous waste management units (HWMUs).
- Subsurface investigation to identify extent of above-WAC material, FRL boundaries, below present grade pads, roads, and building foundations

Within each remediation area, all stockpiles will be characterized prior to remedial excavation.

5.10 Sampling Requirements for Containerized Soil-Like Materials

Sampling and analytical efforts for characterization of soil-like materials in portable waste containers stored within a given remedial area should be completed before the start of remedial excavation within that remedial area or the waste should be relocated to another remediation area facility to appropriately and safely store the waste. Soil-like waste materials stored in nonmovable containers should be characterized before the completion of Title I design.

5.11 Transportation

Traffic and transportation patterns and requirements will be developed during Title I and Title II design and coordinated with other FEMP remediation and administrative activities. The remediation documents will illustrate routes and/or provisions to transport impacted material to the OSDF and other on-site destinations during remediation (e.g., above-WAC drop-off point, SP-7), while minimizing the impact to other non-construction-related traffic in the area.

Principal haul routes to SP7, OSDF, OMTA areas, and soil treatment areas will use existing road surfaces. The Impacted Material Haul Road, at the northern boundary of Area 3A, will be the controlled haul route to SP7, OSDF, and OMTA areas. Impacted material excavated for placement in the OSDF will be hauled to the OMTA southern entrance point and follow the contaminated haul route to the active cell. Above grade debris from the remediation activities

outside Area 3A will be hauled to the OMTA Bulk Debris and Container areas via 2nd Street.

Materials containerized within the excavation area will be placed at the Special Material Transfer Area (SMTA) and hauled directly from the SMTA. In order to haul directly from an established SMTA, the SMTA must be located on the perimeter of the excavation area with direct access to controlled roadways, and have proper administrative and engineering radiological controls.

Traffic routing will be controlled to minimize haul routes through contaminated areas. Haul routes through contaminated areas will be controlled to prevent cross-contamination of certified clean areas. Traffic will be routed via paved roads, to the extent practical, to minimize dust generation and cross-contamination.
Removal of roads will be sequenced to optimize their use during remediation. Existing roads will be used to support as many areas as possible to minimize new construction costs and reduce waste generation.

5.12 Restoration

Grading and filling will be minimized in postexcavated areas (except for safety and GMA protection concerns). In general and where practical, interim restoration should integrate the project with the sitewide Natural Resource Restoration Plan.

Borrow material used for fill will be obtained from certified or precertified areas within the Former Plant Area.

Borrow material used as fill, prior to certification, within high-leachability areas must be obtained from other certified or precertified high-leachability areas, or must otherwise be shown to meet the 20 mg/kg uranium FRL.

Due to the requirement to ensure protection of the GMA, excavations within the Former Plant Area that either breach the sand and gravel deposits of the GMA or extend within 5-feet of GMA sand and gravel deposits must be plugged with uncontaminated clay-like material as quickly as possible. The GMA sands and gravels will not be used for structural or general borrow material.

Borrow material used as fill, prior to certification, within the SWL area must be obtained from other certified or precertified areas, or must otherwise be shown to meet the 38.6 mg/kg uranium FRL.

Winterization will be necessary to ensure that an excavation area can be reentered in the spring in minimal time following winter shutdown. These activities include stabilization of all exposed surfaces within the project limits, maintenance of all drainage channels and erosion and sediment control devices, protection of liquid lines susceptible to freezing, and submittal of itemized winter maintenance plans.

Since all topsoil and gravel within the Former Plant Area will be excavated and disposed during remedial activities, topsoil and gravel usage will not be included in any interim grading, backfilling, or vegetation plan or design. Restoration grading to be completed for this project will be considered interim grading, which may later be altered to a final restoration grade.

6.0 Assumptions Inherent in the Project Scope

This DCP does not address or govern:

- final restoration grading, backfilling, and vegetation requirements or designs;
- use of topsoil and associated certification process during final restoration; and
- excavation of contamination in the GMA sand and gravel layer; and
- remediation of Waste Pit material in Area 6.

APPENDIX A

TABLE A-1

GROUPINGS OF ARARs AND TBCs USED IN TABLE A-2

Presentation Group	Topical Subdivision(s)	Table A-2 Pages
Natural and Cultural Resources	Threatened and Endangered Species Protection	A2-A3
	Archeological, Historic, and Cultural Resource Protection	A3-A6
Air Pathway	Noise Pollution Control	A7
	Air Emissions	A7-A19
Surface Water Pathway	Floodplain/Wetlands Protection	A20-A27
	Discharge to Surface Water	A28-A31
Groundwater Pathway	Groundwater Protection	A32
	Wells - Construction	A32
	Wells - Abandonment	A33
Soil Remediation	Closure of Underground Storage Tanks	A34
	Closure of Hazardous Waste Management Units	A34-A38
	Radionuclide Concentrations	A39-A42
	Lead Concentration	A43
	PCB Concentration	A43
	Certification of Cleanup	A44
Impacted Material Management	Definitions and General Facility Standards	A45-A58
	Management of Low-level Radioactive Material	A59
	Management of Hazardous Remediation Waste	A60-67
	Management of PCB-tainted Material	A68
Post-Closure	Description of Post-closure Care	A69-A71
	Modifications to Post-closure Care Plan or Period	A71
	Property Use Restrictions	A72-A73
	Post-closure Notice/Survey Plat	A73
	Deed Notation	A74

TABLE A-2

PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
NATURAL & CULTURAL RESOURCES						
	THREATENED & ENDANGERED SPECIES PROTECTION					
Procedures for Implementing the National Environmental Policy Act 40 CFR §6.302(h) 10 CFR Part 1021 Endangered Species Act 16 U.S.C. §1531, et seq. Endangered and Threatened Wildlife and Plants 50 CFR §17.21, §17.31, §17.61, §17.71, and §17.94 Interagency Cooperation-Endangered Species Act 50 CFR §402.01	All federal agencies must ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the constituent elements essential to the conservation of a listed species within a defined critical habitat. Additional requirements apply if it is determined that a proposed activity could adversely affect these species or their habitat.	Appl	Appl	Appl	Findings of 1993-94 updated surveys at the FEMP property: • Populations of the state-listed threatened Sloan's crayfish (*Orconectes sloanii*) are located in sections of Paddy's Run. • Good habitat for the federally-listed endangered Indiana bat (*Myotis sodalis*) exists along Paddy's Run and the storm sewer outfall ditch. • Suitable habitat exists in limited areas for the federal-listed endangered running buffalo clover (*Trifolium stoloniferum*), and only in the northern woodlot for the state-listed threatened spring corralroot (*Corallorhiza wisteriana*). • Marginal habitat for the state-listed endangered cave salamander (*Eurycea lucifuga*) exists in a very limited single area. • Neither habitat nor populations were located for the state-listed endangered mountain bindweed (*Polygonum cilinode*) and slender fingergrass (*Digitaria filiformis*).	Section 5.1 of the Sitewide Excavation Plan. However, DOE does not expect to encounter any federal- or state-listed threatened or endangered species or critical habitat in the areas to be addressed by this remediation project; no additional surveys conducted or planned.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
THREATENED & ENDANGERED SPECIES PROTECTION, continued						
Interagency Cooperation-Endangered Species Act 50 CFR §402.12(a), (b)	A biological assessment shall evaluate the potential effects of the action on listed and proposed critical habitat and determine whether any such species or habitat are likely to be adversely affected by the action and is used in determining whether formal consultation or a conference is necessary. These procedures are required for federal actions that are "major construction activities."	Appl	Appl	Appl	No critical habitat is present on the Fernald property. Updated surveys of the FEMP property in 1993 found marginal habitat for the state-listed endangered cave salamander (*Eurycea lucifuga*) exists in a very limited single area.	See preceding.
Endangered Species Regulations ORC 1531.25	No person shall take or possess any native species of wild animal, or any eggs or offspring thereof, that is endangered with state-wide extinction.	Appl	Appl	Appl	Updated surveys of the FEMP property in 1993-94 found populations of the state-listed threatened Sloan's crayfish (*Orconectes sloanii*) in sections of Paddy's Run.	See preceding.
Endangered Species Regulations ORC 1518.02 OAC 1501:18-1	No person shall root-up, injure, destroy, remove, or carry away on or from public highways, public property, or waters of the state, or on or from the property of another, without the written permission of the owner, lessee, or other person entitled to possession, any endangered plant listed in OAC 1501:18-1.	Appl	Appl	Appl	Surveys of the FEMP property in 1994 did not locate populations of the following plants: the federal-listed endangered running buffalo clover (*Trifolium stoloniferum*); the state-listed endangered mountain bindweed (*Polygonum cilinode*) and slender fingergrass (*Digitaria filiformis*); and the state-listed threatened spring corralroot (*Corallorhiza wisteriana*).	See preceding.
ARCHAEOLOGICAL, HISTORIC AND CULTURAL RESOURCE PROTECTION						
Antiquities Act of 1906 16 U.S.C. §431	No person may appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity situated or controlled by the Government of the United States without an applicable permit. Identification and preservation of cultural resources on federal lands is required, including natural landmarks.	Appl	Appl	Appl	Proposed areas of disturbance will be surveyed and consultation will occur between DOE, the Advisory Council on Historic Preservation and the State of Ohio Historic Preservation Office (OHPO) as agreed upon in the Programmatic Agreements (later entries).	Section F.4.2 of the Sitewide Excavation Plan
Historic Sites Preservation Act 16 U.S.C. §461-467		√	Appl	Appl		

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Archaeological Resources Protection Act 16 U.S.C. § 470aa-470ll Procedures for Implementing the National Environmental Policy Act 40 CFR §6.301(c) Protection of Archaeological Resources 43 CFR §7.4(a)	Whenever any Federal agency finds, or is notified, in writing, by an appropriate historical or archaeological authority, that its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific prehistorical, historical, or archaeological data, such agency shall notify the Secretary of the Interior, in writing, and shall provide the Secretary with appropriate information concerning the project, program, or activity. No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands unless such activity is pursuant to a permit. If an EPA activity may cause irreparable loss or destruction of significant scientific, prehistoric, historic, or archaeological data, the responsible official or the secretary of the Interior is authorized to undertake data recovery and preservation activities.	Appl	Appl	Appl	See preceding.	See preceding.
National Historic Preservation Act (NHPA) 16 U.S.C. §470 Protection of Historic Properties 36 CFR Part 800 Procedures for Implementing the National Environmental Policy Act 40 CFR §6.301(a), (b)	A federal agency (DOE) must take into account the effect of an undertaking on historic properties and accord the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are defined as any prehistoric or historic district, building, site, structure, or object included in or eligible for inclusion in the National Register of Historic Places. This term includes artifacts, records, and persons released to and located within such properties. Historic properties that are to be substantially altered or demolished must be recorded for future use and reference. The purpose of this Act is not only to protect those properties listed in or eligible for the National Register of Historic Places, but also those properties that have not been listed or formally determined eligible for the listings. The heads of all Federal agencies shall assume responsibility for the preservation of historic properties which are owned or controlled by such agency. Prior to any Federal undertaking which may directly and adversely affect any National Historic Landmark, the head of the responsible agency shall, to the extent possible, minimize the harm to such landmark.	Appl	Appl	Appl	See preceding.	See preceding.
Archaeological and Historic Preservation Act 16 U.S.C. §469	Upon discovery that a project may cause the irreparable loss, destruction, significant scientific finding, prehistorical finding, or loss of historical or archaeological data, DOE must notify the Dept. of the Interior in writing and provide appropriate information concerning the project. DOE must, with possible assistance from the OHPO, undertake recovery, protection, and preservation of the data.	✓	Appl	Appl	See preceding.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	ARCHAEOLOGICAL, HISTORIC AND CULTURAL RESOURCE PROTECTION, continued					
Executive Order 11593, Protection and Enhancement of Cultural Environment 3 CFR Part 54	An inventory of a site with potential historic places is required for eligibility in the National Register of Historic Places.	√	Appl	Appl	See preceding and following entries.	See preceding.
Programmatic Agreement Regarding Disposition of Facilities under the Operable Unit 3 Record of Decision for Interim Remedial Action at the Fernald Environmental Management Project (January 16, 1996)	• Prepare a report package describing the primary buildings and structures at the FEMP, using existing information to provide information regarding construction details, production process descriptions, design changes, current structural conditions, and current use. The report package is to include written descriptions, photographs, representative engineering drawings, and videotape, as appropriate. If existing documentation is not adequate, additional documentation will be obtained (i.e., additional photographs). Representative support buildings and structures are to be documented with photographs and written summaries as well. • Prepare a separate report package describing the FEMP's role in the DOE weapons complex and the significance of the FEMP contribution to the U.S. defense.		√	√	Draft reports have been submitted to the Ohio Historic Preservation Office (OHPO). Once finalized, both documents will be available to the public in the Public Environmental Information Center and archived as appropriate.	See preceding.
Programmatic Agreement Regarding Archaeological Investigations at the Fernald Environmental Management Project (March 6, 1997)	Annual report packages, the first of which must be submitted on July 1,1997, must be submitted to the Ohio Historic Preservation Office (OHPO) and the Advisory Council on Historic Preservation (the Advisory Council) containing the following information: 1. list of all response actions and associated activities initiated within the year reported on; 2. map showing locations of above response actions/ associated activities; 3. list of response actions/associated activities conducted in previously surveyed (archeological survey) areas; 4. a list of surveys which identified no eligible historic properties; 5. a list of eligible historic properties that were avoided when implementing response actions and/or associated activities; 6. a list of Phase I-III reports generated; and 7. a map of locations of areas identified in item 6 and all properties identified. DOE-FEMP must also submit any and all Phase I reports generated within the last year, and not previously submitted, with the annual report. By September 2, 1997 (within 180 days of the signing of the Programmatic Agreement), submit to the OHPO and the Advisory Council a literature search, examination of aerial photographs, and use of a predictive model for all disturbed and/or contaminated areas of the FEMP (as defined in the Agreement). The predictive model is to utilize existing archeological data from the FEMP and surrounding area to determine the likelihood of additional archeological sites within the contaminated/disturbed areas and the spatial distribution, physical characteristics, and uses.	√	√	√	In accordance with this programmatic agreement, the following will occur for each remediation area as needed: • survey • appropriate consultation with the OHPO and the Advisory Council • appropriate data recovery for potential historic properties discovered. Unexpected discoveries will be addressed accordingly (see Section F.4.2 of the SEP). Draft reports are under preparation for submission to the OHPO and the Advisory Council. Once finalized, the reports will be available to the public in the Public Environmental Information Center and archived as appropriate.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
ARCHAEOLOGICAL, HISTORIC AND CULTURAL RESOURCE PROTECTION, continued						
Native American Graves Protection and Repatriation Act 25 U.S.C. §3001 et seq.	Identification and preservation of cultural resources on federal lands is required, including natural landmarks. DOE must consult with appropriate Indian tribes before the intentional excavation or removal after an inadvertent discovery of Native American cultural items including human remains and objects of cultural significance.	Appl	Appl	Appl	DOE will consult with likely culturally affiliated tribes to determine the excavation, treatment, analysis and preparation of any extra reviews, associated funerary objects, unassociated funerary objects, sacred objects, or objects of cultural patrimony. Consultation will be coordinated with NHPA compliance when possible.	See preceding.
43 CFR Part 10	Provides for the return of human remains and cultural objects from Native American graves to affiliated tribes.	Appl	√	√		
American Indian Religious Freedom Act 42 U.S.C. §1996	Provides for tribal access by native peoples to grave sites and sites of cultural, symbolic, or religious significance.	Appl	Appl	Appl	See preceding.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
AIR PATHWAY						
	NOISE POLLUTION CONTROL					
Noise Control Act, as amended 42 U.S.C. §4901, *et seq.* Noise Pollution and Abatement Act 42 U.S.C. §7641	The public must be protected from noises that jeopardize health and welfare.	Appl	Appl	R&A	Appropriate engineering controls and best management practices will be implemented so that nuisance noise from vehicles and equipment will be reduced to the maximum practicable extent during conduct of the actions.	Section 5.1.2.1 of the Sitewide Excavation Plan
	AIR EMISSIONS					
Solid Waste and Infectious Waste Regulations, Authorized, Limited, and Prohibited Solid Waste Disposal Methods OAC 3745-27-05 ORC 3734.03	Open dumping of solid waste is prohibited [OAC 3745-27-05(C)]. Solid waste disposal by means of open burning, as defined in OAC 3745-19, is permitted only as provided therein [OAC 3745-27-05(B)].	Appl	Appl	Appl		Addressed through the description of the selected remedy in the OU2 ROD (Section 9.0), OU5 ROD (Section 9.0), and OU3 ROD (Section 8.0)
Criteria for Classification of Solid Waste Disposal Facilities and Practices, Air [40 CFR §257.3-7]	Open burning of residential, commercial, institutional or industrial solid waste is prohibited. This requirement does not apply to infrequent burning of agricultural wastes in the field, silvicultural wastes for forest management purposes, land-clearing debris, diseased trees, debris from emergency clean-up operations, and ordnance [40 CFR §257.3-7].	√	√	Appl		
Open Burning Standards, Open Burning in Unrestricted Areas OAC 3745-19-04©	Open burning is allowed for the following purposes [OAC 3745-19-04(C)]: • Recognized horticultural, silvicultural, range, or wildlife management practices [OAC 3745-19-04(C)(5)]. • Disposal of land clearing waste if the following conditions are met [OAC 3745-19-04(C)(4)]: - The fire is set only when atmospheric conditions will readily dissipate contaminants; - The fire does not create a visibility hazard on roadways, railroad tracks, or air fields; - The fire is located at a point on the premises no less than 1000 feet from any inhabited building not located on said premises.	√	√	Appl		

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
General Provisions on Air Pollution Control, Air Pollution Nuisances Prohibited OAC 3745-15-07 ORC 3704.01-.05	Measures shall be taken to adopt and maintain a program for the prevention, control, and abatement of air pollution in order to protect and enhance the quality of the state's air resource so as to promote the public health, welfare, and economic vitality of the people of the state. The emission or escape into open air from any source whatsoever of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors and combinations of the above in such a manner or in such amounts as to endanger the health, safety, and welfare of the public, or to cause unreasonable injury or damage to property shall be declared to be a public nuisance. It is unlawful for any person to cause, permit, or maintain any such public nuisance.	Appl	Appl	Appl	Only fugitive dust (dirt, flyash, bottom ash) is anticipated from this soil remedial action project. Air pollution nuisance prohibitions will be met by employing best management practices for control of fugitive dust.	FEMP Fugitive Dust Control. BAT Determination, and Section 5.1.2 of the Sitewide Excavation Plan
ORC 3734.02(I)	No owner or operator of a hazardous waste facility, in the operation of the facility, shall cause, permit, or allow the emission therefrom of any particulate matter, dust, fumes, gas, mist, smoke, vapor, or odorous substances that, in the opinion of the Director [of Environmental Protection, a.k.a., the Director of the OEPA], unreasonably interferes with comfortable enjoyment of life or property by persons living or working in the vicinity of the facility, or that is injurious to public health. Any such action is hereby declared to be a public nuisance.	√	√	R&A		
Particulate Matter Standards, Ambient Air Quality Standards OAC 3745-17-02(B), (C), (D) [National Primary and Secondary Ambient Air Quality Standards 40 CFR §50.6(a), (b), (c)]	The level of the primary and secondary 24-hour ambient air quality standards for particulate matter is a 150 $\mu g/m^3$, 24-hour average concentration [OAC 3745-17-02(C)]. The level of the primary and secondary annual ambient air quality standards for particulate matter is 50 $\mu g/m^3$, annual arithmetic mean (average) [OAC 3745-17-02(D)]. Particulate matter shall be measured in the ambient air as PM_{10} (particles with an aerodynamic diameter less than or equal to a nominal 10 μm).	Appl	Appl	√	The National Ambient Air Quality Standards (NAAQS) were established as regional goals that states were required to meet and maintain. These ambient air quality standards were never intended, nor are they appropriate, as air quality standards for individual facilities. The methods used by the states to comply with the NAAQS are the State Implementation Plan (SIPs), which include state-level regulations for emission controls or emission standards (included as separate entries). By meeting these pertinent individual requirements, FEMP emissions will not cause an exceedance of the NAAQS/Ohio Ambient Air Quality Standards.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Particulate Matter Standards, Non-Degradation Policy OAC 3745-17-05	The significant and avoidable deterioration of air quality in any part of the area where presently existing air quality is better than the particulate ambient air quality standards in OAC 3745-17-02 (described above) shall be prohibited.	Appl	Appl	√	Appropriate control measures will be applied to all construction grading, excavation, loading/unloading and material management activities to reduce fugitive emissions. Also see preceding entry.	FEMP Fugitive Dust Control BAT Determination, and Section 5.1.2.2 of the Sitewide Excavation Plan
Particulate Matter Standards, Control of Visible Particulate Emissions from Stationary Sources OAC 3745-17-07(A)(1)(a)	Visible particulate emissions from any point source shall not exceed 20 percent opacity, as a 6-minute average, but shall not exceed 60 percent opacity, as a 6-minute average, at any time. Transient exceedance limits are included in this regulation.	Appl	Appl	Appl	All point sources associated with a remedial action project (i.e., sludge dewatering, etc.) will employ best available emissions control technologies to mitigate particulate emissions.	As necessary, point source monitoring requirements will be addressed in the appropriate IRDP.
Particulate Matter Standards, Control of Visible Particulate Emissions from Stationary Sources OAC 3745-17-07(B)(1)	Visible particulate emissions from any fugitive dust source shall not exceed 20 percent opacity, as a 3-minute average.	√	√	√	Appropriate control measures will be applied to all construction grading, excavation, loading/unloading and material management activities to reduce fugitive emissions.	FEMP Fugitive Dust Control BAT Determination, and Section 5.1.2.2 of the Sitewide Excavation Plan

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
Particulate Matter Standards, Control of Visible Particulate Emissions from Stationary Sources OAC 3745-17-07 (B)(4), (5), (6)	There shall be no visible particulate emissions from any paved roadway or paved parking area except for a period of time not to exceed 6 minutes during any 60-minute observation period. There shall be no visible particulate emissions from any unpaved roadway or unpaved parking area except for a period of time not to exceed 13 minutes during any 60-minute observation period. There shall be no visible particulate emissions from any material storage piles except for a period of time not to exceed 13 minutes during any 60-minute observation period.	Appl	R&A	√	Appropriate control measures will be applied to all construction grading, excavation, loading/unloading and material management activities to reduce fugitive emissions.	FEMP Fugitive Dust Control BAT Determination, and Section 5.1.2.2 of the Sitewide Excavation Plan
Particulate Matter Standards, Restriction of Emission of Fugitive Dust OAC 3745-17-08(B)	No person shall cause or permit any fugitive dust source to be operated; or any materials to be handled, transported, or stored; or a building (or its appurtenances) or a road to be used, constructed, altered, repaired, or demolished without taking or installing reasonably available control measures to prevent fugitive dust from becoming airborne. Such reasonably available control measures shall include, but are not limited to, one or more of the following which are appropriate to minimize or eliminate visible particulate emissions of fugitive dust. • The use of water or other suitable dust suppression chemicals for the control of fugitive dust from the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land; or • The periodic application of asphalt, oil, water, or other suitable dust suppression chemicals on dirt or gravel roads and parking lots, and any other surfaces that may cause emissions of fugitive dust.	Appl	R&A	Appl	This requirement is applicable only to certain cities in Butler and Hamilton Counties. Appropriate control measures will be applied to all construction grading, excavation, loading/unloading and material management activities to reduce fugitive emissions.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Particulate Matter Standards, Restrictions on Particulate Emissions from Industrial Processes OAC 3745-17-11	The following are restrictions for particulates from any operation, process, or activity which releases or may release particulate emissions into the ambient air. These limits are based on the weight of material being processed. Process Weight at Maximum Capacity (lb/hr) — Allowable Particulate Emission Rate (lb/hr) 100 — 0.551 200 — 0.877 400 — 1.40 600 — 1.83 800 — 2.22 1000 — 2.58 *These limits do not apply to generation of fugitive dust* subject to OAC 3745-17-08 (listed above).	Appl		R&A	All point sources associated with a remedial action project (i.e., sludge dewatering, etc.) will employ best available emissions control technologies to mitigate particulate emissions.	See preceding.
Ambient Air Quality Standards for Non-methane Hydrocarbons OAC 3745-21-02(C), -03(D)	The ambient air quality guidelines for nonmethane hydrocarbons is a maximum three hour arithmetic mean concentration of 160 $\mu g/m^3$, not to be exceeded between the hours of 6 and 9 a.m. Hourly and 3-hour concentrations must be determined in accordance with prescribed methods.		Appl		The National Ambient Air Quality Standards (NAAQS) were established as regional goals that states were required to meet and maintain. These ambient air quality standards were never intended, nor are they appropriate, as air quality standards for individual facilities. The methods used by the states to comply with the NAAQS are the State Implementation Plan (SIPs), which include state-level regulations for emission controls or emission standards. By meeting these pertinent individual requirements, FEMP emissions will not cause an exceedance of the NAAQS/Ohio Ambient Air Quality Standards.	See preceding relevant Ohio air regulation citations.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
National Primary and Secondary Ambient Air Quality Standards 40 CFR §50.12 Ohio Lead Emissions, Ambient Air Quality Standards—Lead OAC 3745-71-02(A)	The ambient air quality standards for lead shall be a maximum arithmetic mean of 1.5 micrograms per cubic meter during any calendar quarter.	R&A	R&A		See preceding.	See preceding
National Primary and Secondary Ambient Air Quality Standards 40 CFR Part 50	The following are the primary National Ambient Air Quality Standards (NAAQS):	R&A			Note that other NAAQSs are presented in preceding entries.	
	Criteria Pollutant / Primary Standard, ppm / Averaging Time					
	Carbon Monoxide / 9 / 8-hour	R&A				
	35 / 1-hour					
	Nitrogen Dioxide / 0.053 / Annual	R&A				
	Ozone / 0.12 / 1-hour	R&A				
	Sulfur oxides / 0.03 / Annual	R&A				
	0.14 / 24-hour					
Permit to Install New Sources of Pollution OAC 3745-31-05 (A)(3)	The installation or modification and operation of an air contaminant source, solid waste disposal facility, water pollution source, disposal system, land application of sludge, or public water system, must employ the best available technology. The terms used in the above are defined in OAC 3745-15-01, unless otherwise defined in OAC 3745-31-01.	R&A	Appl	R&A	Appropriate control measures will be applied to all construction grading, excavation, loading/unloading and material management activities to reduce fugitive emissions. All point sources associated with a remedial action project (i.e., sludge dewatering, etc.) will employ best available emissions control technologies to mitigate particulate emissions.	FEMP Fugitive Dust Control BAT Determination, and Section 5.1.2.2 of the Sitewide Excavation Plan

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Standards of Performance for New Stationary Sources, Subpart OOO—Standards of Performance for Nonmetallic Mineral Processing Plants 40 CFR §60.672(a), (d), (e)	No owner or operator shall cause to be discharged into the atmosphere from a crusher any emissions which: • Contain particulate matter in excess of 0.05 grams per dry cubic meter at standard conditions (g/dscm); and • Exhibit greater than 7 percent opacity Truck dumping of nonmetallic minerals into any crusher is exempt from these requirements.	R&A	√		It is not anticipated that a crusher will be used during this remedial action project. All point sources associated with a remedial action project (i.e., sludge dewatering, etc.) will employ best available emissions control technologies to mitigate particulate emissions.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
40 CFR Part 61, Subpart M-National Emission Standard for Asbestos, Standard for Waste Disposal for Manufacturing, Fabrication, Demolition, Renovation, and Spraying Operation 40 CFR §61.150	(a) Discharge no visible emissions [of asbestos] to the outside air during the collection, processing, packaging, or transporting of any asbestos-containing waste material, or use one of the emission control methods specified in paragraphs (a)(1) through (4) of this section: (1) Adequately wet asbestos-containing material (ACM). After wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, put materials that will not fit into containers without additional breaking into leak-tight wrapping. Label the containers or wrapped materials in accordance with 29 CFR 1910.1001(j)(2) or 1926.58(k)(2)(iii). ... (4) Use an alternative emission control and waste treatment method that has received prior approval from the Administrator. (5) As applied to demolition and renovation, the requirements above under paragraph (a) of this section do not apply to Category I non-friable ACM waste and Category II non-friable ACM waste that did not become crumbled, pulverized, or reduced to powder. "Adequately wet" means sufficiently mix or penetrate with liquid to prevent the release of particulates; if visible emissions are observed coming from the asbestos-containing material, the material has not been adequately wetted [40 CFR §61.41].	√	√	Appl		See preceding, and following sections of the Sitewide Excavation Plan: 2.5.8 Special Materials 3.3.2.2 Special Materials F.4.1.1 Asbestos
Asbestos Emission Control, Standard for Asbestos Waste Handling OAC 3745-20-05(B), (C)&(D)	(B) Discharge no visible emissions [of asbestos] during the collection, processing, packaging, transporting or deposition of any asbestos-containing waste material, and use one of the emission control methods below: (1) Adequately wet asbestos-containing material and seal the material into durable leak-tight containers or enclosure system. (2) For facilities where asbestos was not removed prior to demolition [or excavation], keep asbestos-containing waste adequately wet or sealed/encapsulated until collected for disposal.					

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	(C) Seal all friable asbestos-containing waste material into durable leak-tight disposal containers or use an approved alternative disposal system in accordance with the following: (1) Label all containers of asbestos-containing waste material: DANGER CONTAINS ASBESTOS FIBERS AVOID CREATING DUST CANCER AND LUNG DISEASE HAZARD R.Q. Hazardous Substance N.O.S. asbestos ORM-E 9188 (2) Seal asbestos-containing waste materials in plastic bags at least 6 mils (0.006 inch) thick, and seal that in a second clean, leak-tight plastic bag at least 6 mils thick; or (4) Facility components coated with, covered or containing friable asbestos materials and removed in sections or units — Seal with leak-tight plastic at least 12 mils (0.012 inch) thick or leak-tight polypropylene woven fabric at least 10 mils (0.010 inch) thick; or (3) Whenever necessary to prevent any asbestos-containing waste material from penetrating a container (bag or wrap) — Seal the materials using a combination of a 6 mils thick plastic bag and a leak-tight steel, plastic, or fiber drum, or reinforced disposal box, leak-tight polypropylene woven fabric bag, or similar suitable and durable container. Fit drums with a matching lid and lock-rims. Band and seal boxes with reinforced tape or in accordance with manufacturers recommendations; or (5) Asbestos-containing waste materials, facility components, and contaminated debris may be disposed of using an alternative disposal system which has received prior approval from the Director. (D) Prepare and secure any load of asbestos-containing waste material in a manner that prevents any visible emissions [of asbestos], load loss, and spillage or leakage of liquids.					

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
Asbestos Emission Control, Standard for Active Asbestos Disposal Sites OAC 3745-20-06(A)&(B) [40 CFR Part 61, Subpart M-National Emission Standard for Asbestos, Standard for Active Waste Disposal Sites, 40 CFR §61.154]	(A) Each owner or operator of an active asbestos waste disposal site shall cause or permit no visible emissions [of asbestos] to the outside air; or shall comply with the requirements of paragraph (B) of this rule. (B) Rather than meet the no visible emissions requirement of paragraph (A) of this rule, each owner or operator of an active asbestos waste disposal site shall comply with the following: (1) There shall be no visible emissions from asbestos-containing waste materials during the on-site transportation, transfer, deposition or compacting operations. (2) Deposition and burial operations shall be conducted in a manner which prevents handling by equipment or persons that causes asbestos-containing waste materials to be broken-up or dispersed before the materials are buried. (3) As soon as practicable after deposition of the asbestos-containing waste materials but no later than at the end of each operating day, the asbestos-containing waste material deposited at the site during the operating day shall be buried with at least twelve inches of compacted nonasbestos-containing material. Alternatively, any owner or operator of an active asbestos waste disposal site may apply for approval of the Director [of Environmental Protection, a.k.a. Director of the OEPA] to utilize alternative control measures to bind dust, control wind erosion or convert [friable] asbestos to non-friable forms. (4) During the unloading, deposition, burial, and initial compaction of asbestos-containing materials, the owner or operator of the active [asbestos] waste disposal site shall establish a restricted area adequate to deter the unauthorized entry of the general public and any unauthorized personnel from any location within one hundred feet of the operations, and shall display the following information on a sign not less than twenty by fourteen inches, so that it is visible before entering the restricted area: ASBESTOS DUST HAZARD Do Not Remain In Area Unless Your Work Requires It Breathing Asbestos Dust Is Hazardous To Your Health	√	√	Appl	Pertinent to the management of asbestos-containing materials. Also note that requirements from paragraphs (A) and (B) which are pertinent to disposal of asbestos-containing materials, are included in the OSDF Impacted Materials Placement Plan. NOTE: The sizing & language for warning signs under (B)(4) at left conflicts with that required by OSHA under 29 CFR §1926.1101(k)(7). The FEMP will follow either the Ohio active asbestos waste disposal sites language or the OSHA required sign language: DANGER ASBESTOS CANCER & LUNG DISEASE HAZARD AUTHORIZED PERSONNEL ONLY OSHA does not impose a minimum sign size.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Asbestos Emission Control, Standard for Inactive Asbestos Disposal Sites OAC 3745-20-07(C) [40 CFR Part 61, Subpart M-National Emission Standard for Asbestos, Standard for Inactive Waste Disposal Sites, for Asbestos Mills and Manufacturing and Fabricating Operations 40 CFR §61.151]	The owner or operator may use an alternate control method that has received prior approval of the Director [of Environmental Protection, a.k.a. Director of the OEPA] rather than comply with the requirements of paragraph (A) [emissions and cover requirements] or (B) [posting and access control requirements] of this rule.	√	√	Appl	These requirements for inactive asbestos waste disposal sites are very similar to those for active asbestos waste disposal sites under OAC 3745-20-06 (preceding entry). During soil remediation activities under this remedial action project, the requirements for active asbestos disposal sites (preceding entry) will be followed while managing friable asbestos-containing material. Also note that requirements pertinent to disposal of asbestos-containing materials under paragraphs (A) and (C) of OAC 3745-20-07 are included in the OSDF Impacted Materials Placement Plan.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	AIR EMISSIONS, continued					
Asbestos Emission Control, Standard for Inactive Asbestos Disposal Sites OAC 3745-20-07(D) [40 CFR Part 61, Subpart M-National Emission Standard for Asbestos, Standard for Inactive Waste Disposal Sites for Asbestos Mills and Manufacturing and Fabricating Operations, 40 CFR §61.151(d)]	Each owner or operator of an inactive asbestos waste disposal site shall notify the Director [of Environmental Protection, a.k.a. the Director of the OEPA] in writing prior to disturbing or removing any asbestos-containing waste material. The notice shall contain:	√	√	√	Submission of the project-specific IRDPs to OEPA constitute this notification.	
	• the reason for disturbing the waste,					The reason for disturbing the material is documented in the OU2, OU5 and OU3 RODs.
	• the procedures to be used to control emissions,					FEMP Fugitive Dust Control BAT Determination, the OSDF Impacted Materials Placement Plan, and following sections of the Sitewide Excavation Plan: 2.5.8 Special Materials 3.3.2.2 Special Materials 5.1.2.2 Fugitive Emissions F.4.1.1 Asbestos
	• the duration of the operation, and				Project schedules contained in project-specific IRDPs.	
	• the location of the final disposal site.					The OSDF, unless the OSDF WAC is not met; else, an off-site permitted/licensed disposal facility.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
National Emission Standards for Hazardous Air Pollutants, Subpart H—National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities, 40 CFR §61.90, §61.91 and §61.92 - .97 [Radiation Protection of the Public and the Environment DOE Order 5400.5 Chapter II (1)(b)]	Emissions of radionuclides (except radon-220 and radon-222) to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr. To determine compliance with the standard, radionuclide emissions shall be determined and effective dose equivalent values to members of the public calculated using EPA-approved sampling procedures, computer models CAP-88 or AIRDOS-PC, or other procedures for which EPA has granted prior approval.	Appl	Appl	Appl		Section 6 of the Integrated Environmental Monitoring Plan (IEMP) and the following sections of the Sitewide Excavation Plan: 5.1.2.3 Airborne Radiological Particulates 5.1.2.4 Radon 5.1.2.5 Direct Radiation
National Emission Standards for Hazardous Air Pollutants, Subpart Q—National Emission Standards for Radon Emissions From Department of Energy Facilities 40 CFR §61.190, §61.192	No source at a DOE facility shall emit more than 20 pCi/m^2/sec of radon-222 as an average for the entire source into the air.	Appl	Appl	R&A	The existing distribution of contaminants within the site soils attains compliance with this requirement. Will be addressed sitewide as necessary by the Integrated Environmental Monitoring Plan (IEMP).	

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
SURFACE WATER PATHWAY						
	FLOODPLAIN/WETLANDS PROTECTION					
Executive Order 11990, Protection of Wetlands	Federal agencies are required to take action to avoid adversely impacting wetlands wherever possible, to minimize wetland destruction, and to preserve the values of wetlands.	Appl	Appl		Floodplain and wetland impacts associated with soil remediation activities will be minimized and avoided to the maximum extent practicable. Projects with unavoidable impacts will be undertaken in accordance with 33 CFR Parts 323 and 330. A review of an overlay of each remediation area boundary on the FEMP Jurisdictional Wetland Delineation (Drwg. 75X-5500-G-00372) will be conducted to determine the approximate acreage of jurisdictional wetlands that will be dredged and filled during excavation of the remediation area. Dredge and fill activities within these wetlands will comply with the substantive requirements of Nationwide Permit Nos. 38 and 26 (subsequent entry) — promulgated in Appendix A of 33 CFR Part 330 (subsequent entry) and OEPA's corresponding State Water Quality Certification (see subsequent entry for OAC 3745-32).	Approximately 36 acres of jurisdictional wetlands and 9 acres of waters of the United States were identified on the FEMP property as a result of the 1993 Jurisdictional Wetlands & Waters of the U.S. (1993 FEMP Wetland Delineation). The U.S. Army Corps of Engineers officially approved the delineation on August 19, 1993. See also: Appendix H of the OU2 FS Report; Appendix J of the OU5 FS Report, and Appendix J of the OU3 RI/FS. The Natural Resources Restoration Plan (NRRP); also, remedial action completion reports must include NEPA compliance, as per following sections of the Sitewide Excavation Plan: 1.4.2 Related Documents 7.4 Certification Report 7.5 Other Related Future Documents
Procedure for Implementing the National Environmental Policy Act 40 CFR §6.302(a)	Federal agencies conducting certain activities must avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands, and avoid support of new construction in wetlands when a practicable alternative exists.	Appl	Appl		See preceding.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Executive Order 11988, Floodplain Management Procedures for Implementing the National Environmental Policy Act 40 CFR §6.302(b)	Federal agencies must evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain.	Appl	Appl		Remediation is needed, and can not be avoided. Nationwide Permit # 38 (subsequent entry) authorizes such remedial activity in a floodplain. The floodplain will not be developed as a result of this federal agency action.	An updated floodplain determination was conducted in October 1992 for Paddy's Run using the U.S. Army Corps of Engineers' standard HEC2 water surface profile analysis program. The 100-year flood elevations reach the western slope of the Inactive Flyash Pile and the toe of the South Field slope.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	FLOODPLAIN/WETLANDS PROTECTION, continued					
DOE Compliance with Floodplain/ Wetlands Environmental Review Requirements 10 CFR §1022.3(a), 3(b)(1), 3(b)(2), 3(b)(3), 3(b)(5), 3(b)(6), 3(c), 3(d), 3(e)	DOE shall exercise leadership and take action to: • Avoid to the extent possible the long- and short-term adverse impacts associated with the destruction of wetlands and the occupancy and modification of floodplains and wetlands, and avoid direct and indirect support of floodplain and wetland development wherever there is a practicable alternative. • Incorporate floodplain management goals and wetlands protection considerations into its planning, regulatory, and decision-making processes and shall to the extent practicable: - Reduce the hazard and risk of flood loss. - Minimize the impact of floods on human safety, health, and welfare. - Restore and preserve natural and beneficial values served by the floodplain. - Minimize the destruction, loss, or degradation of wetlands. - Preserve and enhance the natural and beneficial values of wetlands. • Undertake a careful evaluation of the potential effects of any DOE action taken in a floodplain and any new construction undertaken by DOE in wetlands not located in a floodplain. • Identify, evaluate, and as appropriate, implement alternative actions which may avoid or mitigate adverse floodplain/wetlands impacts. • Provide opportunity for early public review of any plans or proposals for actions in floodplains and new construction in wetlands.	Appl	Appl	Appl	10 CFR Part 1022 is the DOE implementing regulation for Executive Orders 11988 and 11990 (see corresponding preceding entries).	Remediation decisions included avoidance to/ minimization of wetlands impacts. See: Appendix H of the OU2 FS Report; Appendix J of the OU5 FS Report, and Appendix J of the OU3 RI/FS. Also, see preceding entries.
DOE Compliance with Floodplain/ Wetlands Environmental Review Requirements 10 CFR §1022.5(b), (h)	This part shall apply to all proposed floodplain/wetlands actions, including those sponsored jointly with other agencies, where practicable alternatives to the proposed actions are still available. The policies and procedures of this part which are applicable to floodplain actions shall apply to all proposed actions which occur in a wetlands located in a floodplain.	Appl	Appl	Appl	See preceding entries.	See preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
DOE Compliance with Floodplain/ Wetlands Environmental Review Requirements 10 CFR §1022.11 (a), (b), (c)	Concurrent with its review of a proposed action to determine appropriate NEPA requirements, DOE shall determine applicability of the floodplain management and wetlands protection requirements of this part. In making a floodplain determination, DOE shall utilize the Flood Insurance Rate Maps (FIRMs) or the Flood Hazard Boundary Maps (FHBMs) prepared by the Federal Insurance Administration of the Department of Housing and Urban Development to determine if a proposed action is located in the base or critical action floodplain, as appropriate. For a proposed action in an area of predominately federal or state land holdings where FIRM or FHBM maps are not available, information shall be sought from the land administering agency (e.g., Bureau of Land Management, Soil Conservation Service, etc.) or from agencies with floodplain analysis expertise.	Appl	Appl		See preceding entries.	See preceding entries.
DOE Compliance with Floodplain/ Wetlands Assessments 10 CFR §1022.12(a)	If DOE determines, pursuant to 10 CFR §§ 1022.5 and 1022.11, that this part is applicable to the proposed action, DOE shall prepare a floodplain/wetlands assessment, according to the requirements in this section (10 CFR §1022.12).	Appl	Appl		See preceding entries.	See preceding entries.
DOE Compliance with Floodplain/ Wetlands Environmental Review Requirements 10 CFR §1022.15(a)	If DOE finds that no practicable alternative to locating in the floodplain/wetland is available, consistent with the policy set forth in Executive Order 11988, DOE shall, before taking action, design, or modify its action in order to minimize potential harm to or within the floodplain or wetland.	Appl	Appl		See preceding entries.	See preceding entries.
Federal Water Pollution Control Act (a.k.a., Clean Water Act) General Regulatory Policies 33 CFR §323.3	Permits will be required for the discharge of dredged or fill material into waters of the United States including wetlands. Certain discharges specified in 33 CFR Part 330 are permitted by that regulation (nationwide permits). If a discharge of dredged or fill material is not permitted by 33 CFR Part 330 (Nationwide Permits), an individual section 404 permit will be required for the discharge of dredged or fill material into waters of the United States. Discharges of dredged or fill material into waters of the United States done by or on behalf of any Federal agency, other than the Corps of Engineers, are subject to the authorization procedures of these regulations. Remedial actions involving the discharge of dredge and fill material into these areas shall meet the substantive requirements of this section and 40 CFR Part 230.	Appl	Appl		See preceding entry for Executive Order 11990 (first Floodplain/Wetland Protection entry). Discharges of dredged and fill material not authorized by a NWP will be conducted in accordance with the substantive requirements of these regulations.	See preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	FLOODPLAIN/WETLANDS PROTECTION, continued					
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit (NWP) Program 33 CFR Part 330	The U.S. Army Corps of Engineers has authorized certain categories of activities involving the discharge of dredged and fill material into wetlands and waters of the United States under the NWP program. Activities involving the discharge of dredged and fill material will be conducted in accordance with the substantive requirements of applicable NWPs as required. Discharges not authorized by NWP will be conducted in accordance with the substantive requirements of 33 CFR Part 323 and 40 CFR Part 230.	√	Appl	R&A	See preceding entries.	Following sections of the Sitewide Excavation Plan: 3.3.1 Implementation of Construction, Excavation, and Material-handling Activities 5.1.1 Natural Resource Impacts 5.1.3 Surface Water Pathway
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit Program 33 U.S.C. §1341(a)(1), (d) 33 CFR §330.1(c)	An activity is authorized under an Nationwide Permit (NWP) only if that activity and the permittee satisfy all of the individual NWP's terms and conditions. Potentially applicable NWPs include: • Nationwide Permit #38 — Cleanup of Hazardous and Toxic Waste - This permit authorizes specific activities required to affect the containment, stabilization or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority provided the permittee notifies the district engineer. - For discharges in special aquatic sites, including wetlands, the notification must include a delineation of affected special aquatic sites, including wetlands. - This nationwide permit does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste. • Nationwide Permit #26 — Headwaters and Isolated Waters Discharges - The discharge does not cause the loss of more than 10 acres of waters of the United States. - The permittee notifies the district engineer if the discharge would cause the loss of waters of the United States greater than 1 acre. - For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites, including wetlands. - The discharge, including all attendant features, both temporary and permanent, is part of a single and complete project.	Appl	Appl	R&A	See preceding entry for Executive Order 11990 (first Floodplain/Wetlands Protection entry).	January 17, 1992 letter from Donald R. Schregardus, Director of the OEPA, to the U.S. Army Corps of Engineers, "401 Certification — Grant," the OEPA conditionally certified that projects authorized by NWP #s 38 and 26 will comply with the applicable provisions of the Federal Water Pollution Control Act.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit Program Section B(26) to Appendix A of 33 CFR Part 330	Discharges of dredged or fill material into headwaters and isolated waters [under Nationwide Permit # 26] are approved provided: • The discharge does not cause the loss of more than 10 acres of waters of the United States. • The permittee notifies the district engineer if the discharge would cause the loss of waters of the United States greater than 1 acre. • For discharges in special aquatic sites, including wetlands, the notification must also include a delineation of affected special aquatic sites, including wetlands. • The discharge, including all attendant features, both temporary and permanent, is part of a single and complete project.	√	√	√	See preceding and following entries.	See preceding and following entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	FLOODPLAIN/WETLANDS PROTECTION, continued					
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit Program 33 CFR §330.4 (c)(1) Ohio Section 401 State Water Quality Certifications OAC 3745-32-02	Section 401 State Water Quality Certification pursuant to Section 401 of the Clean Water Act, or waiver thereof, is required to prior to issuance or re-issuance of individual or nationwide permits authorizing (dredge and fill) activities which may result in a discharge into waters of the United States. State Water Quality Certification is granted provided: 1. The discharge does not prevent or interfere with the attainment or maintenance of applicable water quality standards; and 2. The discharge does not result in a violation of any applicable provisions of the Federal Water Pollution Control Act (a.k.a., Clean Water Act).	Appl	Appl		See preceding and following entries.	January 17, 1992 letter from Donald R. Schregardus, Director of the OEPA, to the U.S. Army Corps of Engineers, "401 Certification — Grant," the OEPA conditionally certified that projects authorized by the NWP #s 38 and 26 (see previous entry) will comply with the applicable provisions of the Federal Water Pollution Control Act.
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit Program Section C of Appendix A to 33 CFR Part 330	In addition to the General Conditions, the following [Section 404 only] conditions apply only to activities that involve the discharge of dredge or fill material and must by followed in order for authorization of the nationwide permits to be valid: • No discharge of dredged or fill material may consist of unsuitable material (e.g., trash, debris, car bodies, etc.). And material discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act). • Discharges of dredged or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site, unless the District Engineer has approved a compensation mitigation plan for the specific regulated activity.	✓	✓		See preceding entries.	The Natural Resources Restoration Plan (NRRP)

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	FLOODPLAIN/WETLANDS PROTECTION, continued					
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Nationwide Permit Program Section C of Appendix A to 33 CFR Part 330	Factors that the District Engineer will consider when determining the acceptability of appropriate and practicable mitigation include, but are not limited to: • To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of overall project purposes. • To the extent appropriate, permittees should consider mitigation banking and other forms of mitigation including contribution to wetland trust funds, which contribute to the restoration, creation, replacement, enhancement, or preservation of wetlands. • Furthermore, examples of mitigation that may be appropriate and practicable include but are not limited to: reducing the size of the project; establishing buffer zones to protect aquatic resource values; and replacing the loss of aquatic resource values by creating, restoring, and enhancing similar functions and values. In addition, mitigation must address impacts and cannot be used to offset the acreage of wetland losses that would occur in order to meet the acreage limits of some of the nationwide permits.	✓	✓		See preceding entries.	The Natural Resources Restoration Plan (NRRP)
Federal Water Pollution Control Act (a.k.a., Clean Water Act) §404 (33 U.S.C. §1344) Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, Subpart B—Compliance With the Guidelines, Restrictions on Discharge 40 CFR §230.10	No discharge of dredged or fill material shall be permitted: • If there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as, the alternative does not have other significant adverse environmental consequences. • Unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. No discharge of dredged or fill material shall be permitted if it: • Causes or contributes, after consideration of disposal site dilution and dispersion, to violations of any applicable state water quality standard. • Violates any applicable toxic effluent standard or prohibition under section 307 of the Clean Water Act. • Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or results in likelihood of the destruction or adverse modification or a habitat which is determined to be a critical habitat under the Endangered Species Act of 1973, as amended.	Appl	✓	✓	See preceding entries.	Appendix H of the OU2 FS Report; Appendix J of the OU5 FS Report, and Appendix J of the OU3 RI/FS.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DISCHARGE TO SURFACE WATER					
Pollution to Waters of the State ORC 6111.04	No person shall cause pollution or place or cause to be placed any sewage, industrial waste, or other wastes in a location where they cause pollution of any waters of the state. No person to whom a permit has been issued shall place or discharge, or cause to be placed or discharged, in any waters of the state any sewage, industrial waste, or other wastes in excess of the permissive discharges specified under such existing permit without first receiving a permit from the Director to do so. Pollution to waters of the state is prohibited.	Appl	Appl	R&A		FEMP Site NPDES Permit Number 1IO00004*ED, the FEMP Stormwater Pollution Prevention Plan (RM-0039), Section 4 of the Integrated Environmental Monitoring Plan (IEMP), and the following section of the Sitewide Excavation Plan: 5.1.3 Surface Water Pathway
Compliance with Ohio Water Pollution Control Requirements ORC 6111.07(A), (C)	Failure to comply with water pollution control requirements is prohibited.	✓	Appl	Appl		See preceding.
Water Quality Standards, Criteria Applicable to All Waters OAC 3745-1-04	To every extent practical and possible, all surface waters of the State of Ohio shall be free from: • Suspended solids or other substances that enter the waters as a result of human activity that will form putrescent or otherwise objectionable sludge deposits • Floating debris, oil, scum and other floating materials entering the waters as a result of human activity in amounts sufficient to be unsightly or cause degradation • Materials entering the waters as a result of human activity producing color, odor or other conditions in such a degree as to create a nuisance • Substances entering the waters as a result of human activity in concentrations that are toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone • Nutrients entering the waters in concentrations that create nuisance growths of aquatic weeds or algae	✓	R&A	R&A		See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DISCHARGE TO SURFACE WATER, continued					
Water Quality Standards, Antidegradation Policy OAC 3745-1-05(A)&(B)	(A) Existing instream water uses as defined in OAC 3745-1-07 [subsequent entry] shall be maintained and protected. No further water quality degradation which would interfere with or become injurious to designated uses is allowable. (B) Waters in which existing water quality is better than the criteria prescribed in these rules and exceeds those levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water shall be maintained and protected. ... Degradation of water quality shall not interfere or become injurious to existing or planned uses, and the Director shall require that ... feasible management or regulatory programs pursuant to Section 208 and 303 of the Act [Clean Water Act], 33 U.S.C. Sections 1288 and 1313, be applied to nonpoint sources.	√	√	Appl	Soil remedial action projects will ensure that existing instream water uses of the Great Miami River and Paddy's Run will be maintained as health protective.	See preceding.
Water Quality Standards, Great Miami River OAC 3745-1-21	Paddy's Run and the Great Miami River are designated as: • Warm water aquatic life habitat • Agricultural and industrial water supply • Primary contact recreation The Great Miami River between Ross Road (RM 95.7) to Taylorsville Dam (RM 92.6) is a state resource water, and RM 130 and 118 are public water supplies.	Appl	Appl	Appl	Discharges to the Great Miami River and Paddy's Run must not cause a violation of applicable numeric or narrative water quality standards for these designations. The FEMP effluent discharge pipe, located at River Mile (RM) 24.73 on the Great Miami River, is downstream of the state resource waters and public water supplies.	See preceding.
National Pollutant Discharge Elimination System 40 CFR §122.26(a)(l)(ii), 40 CFR §122.26(b)(14)(v), (x)	A discharge composed entirely of storm water associated with industrial activity is required to obtain a NPDES permit. These categories of facilities are considered to be engaging in "industrial activity": • Landfills, land application sites, and open dumps that receive or have received any industrial wastes (waste that is received from any of the facilities described under this subsection), including those that are subject to regulation under Subtitle D of RCRA; and • Construction activities including clearing, grading, and excavation that disturbs five acres or more of total land area.	Appl	Appl	Appl	Discharges of stormwater associated with industrial and/or construction activities are regulated in accordance with the existing FEMP NPDES Permit (Ohio EPA Number 1IO00004*ED), and the FEMP Stormwater Pollution Prevention Plan (RM-0039).	See preceding.
Ohio NPDES Permits, Ohio NPDES Permits Required OAC 3745-33-02(A)	No person may discharge any pollutant or cause, permit, or allow a discharge of any pollutant [from a point source] without applying for and obtaining an Ohio NPDES permit in accordance w with the requirements of this Chapter, 3745-33.	√	√	√	See preceding and following entries.	FEMP Site NPDES Permit (Ohio EPA Number 1IO00004*ED), and the FEMP Stormwater Pollution Prevention Plan (RM-0039).

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Ohio NPDES General Permits, Ohio NPDES Permit Required OAC 3745-38-02(A)	No person may discharge any pollutant or cause, permit, or allow a discharge of any pollutant from a point source without either applying for and obtaining an Ohio NPDES permit in accordance w with the requirements of Chapter 3745-33 of the Administrative Code [preceding entry], ... or have authorization to discharge under an Ohio NPDES general permit in accordance with the requirements of this chapter [3745-38]. **NOTE:** In September 1992, the FEMP applied for an individual stormwater permit to cover its industrial stormwater discharges to Paddy's Run. On the basis of the information provided in the original FEMP Stormwater Permit Application, Ohio EPA has chosen to regulate FEMP site industrial stormwater discharges under the individual permit process (OAC 3745-33, preceding entry), by incorporating stormwater monitoring requirements at Paddy's Run into the NPDES permit. The site NPDES permit also addresses discharges of stormwater associated with construction activities by requiring a Stormwater Pollution Prevention Plan that defines the manner in which these discharges will be managed.	✓	✓	✓	In accordance with the note at left, the general permitting process described in OAC 3745-38 is not applicable to the FEMP site stormwater discharges. Rather, these are regulated within the context of the existing FEMP NPDES Permit (Ohio EPA Number 1IO00004*ED) and the FEMP Stormwater Pollution Prevention Plan (RM-0039), both of which derive their regulatory basis from OAC 3745-33 (preceding entry).	See preceding entries.
Rules and Regulations of the Hamilton County Soil and Water Conservation District Governing Earthwork for Unincorporated Hamilton County, Ohio	Temporary and/or permanent erosion and sediment control features and devices shall be designed and constructed in general accordance with the State of Ohio Temporary Erosion Control Specifications. *Exempted* from these requirements are: • *any public work performed by or under control of any governmental agency*, provided such operations do not cause instability of any adjacent or contiguous property and substantially equivalent sediment control policies are applied [3.10 E]. • *operations involving process and stockpiling of soils or rock materials where controlled by other regulations*, provided such operations do not cause instability of any adjacent or contiguous property [3.10 H].	✓	TBC	TBC		FEMP Site NPDES Permit (OEPA Number 1IO00004*ED), and the FEMP Stormwater Pollution Prevention Plan (RM-0039), and the following sections of the Sitewide Excavation Plan: 5.1.3 Surface Water Pathway App F Implementation of Construction

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DISCHARGE TO SURFACE WATER, continued					
Federal Water Pollution Control Act (a.k.a., Clean Water Act) Subpart K—Best Management Practices (BMP) Programs 40 CFR §125.104	BMP programs shall be developed in accordance with good engineering practices and: 1) Be documented in narrative form and include any necessary plot plans, drawings or maps; 2) Establish specific objectives for the control of toxic and hazardous pollutants: (a) Each facility component or system shall be examined for its potential for causing a release of significant amounts of toxic or hazardous pollutants to waters of the United States due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc. (b) Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances to result in significant amounts of toxic or hazardous pollutants reaching surface waters, the program should include a prediction of the direction, rate of flow and total quantity of toxic or hazardous pollutants which could be discharged from the facility as a result of each condition or circumstance; 3) Establish specific BMPs to meet the objectives identified in (2) above, addressing each component or system capable of causing a release of significant amounts of toxic or hazardous pollutants to the waters of the United States.		Appl	R&A	BMP requirements will be met by implementing FEMP's BMP Plan. The BMP Plan will be progressively updated to accommodate changing site activities during the conduct of CERCLA remedial actions.	Addressed as part of the selected remedy described in the OU5 ROD. Also see preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
GROUNDWATER PATHWAY						
	GROUNDWATER PROTECTION					
Safe Drinking Water Act 42 U.S.C. §1424(e)	All Federal financially assisted projects constructed in the area of a sole source aquifer and its principal recharge zone will be subject to EPA's review to insure that these projects are designed and constructed so that they do not create a significant hazard to public health.	Appl	Appl	Appl	A notice in 53 FR 15876 (May 4, 1988) designated the Buried Valley Aquifer System of the Great Miami/ Little Miami River Basins of southwestern Ohio as a sole or principal source of drinking water. The Fernald site is located above this aquifer.	EPA and OEPA review of project submittals
	WELLS — CONSTRUCTION					
Water Well Standards, Pumping Wells OAC 3745-9-08(C)	Pumps may only be primed with potable water.		Appl		Pertains to all well pumps that require priming.	The Sitewide CERCLA Quality Assurance Project Plan (SCQ), the Integrated Environmental Monitoring Plan (IEMP), and the individual project-specific plans for sampling.
Water Well Standards, Monitoring Well Maintenance and Modification OAC 3745-9-09(A) through (C), and (E) through (G)	Monitoring wells must be maintained or modified to avoid cross-contamination of groundwater.		Appl		Pertains to all groundwater wells and piezometers.	The Sitewide CERCLA Quality Assurance Project Plan (SCQ), the Integrated Environmental Monitoring Plan (IEMP), and the following section of the Sitewide Excavation Plan: F.6.3 Monitoring Well Preservation

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	WELLS — ABANDONMENT					
Water Well Standards, Abandonment of Test Holes and Wells OAC 3745-9-10	Upon completion of testing, a test hole shall be either completely filled with grout or such other material as will prevent contaminants from entering groundwater. If a well [or similar device] containing walls is not being used for obtaining groundwater or for determining the quality, quantity, or level of groundwater, it shall be completely filled with grout or other similar material as wneeded, wells, peizometers and				lysimeters are to be properly plugged and abandoned in accordance with these requirements.	The Sitewide CERCLA Quality Assurance Project Plan (SCQ), the Integrated Environmental Monitoring Plan (IEMP), and the following section of the Sitewide Excavation Plan: F.6.1 Plugging and Abandonment F.6.2 Monitoring Well Excavation

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
SOIL REMEDIATION						
CLOSURE OF UNDERGROUND STORAGE TANKS						
General Requirements OAC 1301:7-7-36 40 CFR §§280.61 through .66	Owner or operators of petroleum or hazardous substance underground storage tank (UST) systems must, in response to a confirmed release from the UST system, comply with abatement measures, site characterization, product removal, investigations for soil and groundwater cleanup, and corrective action plan, except for USTs excluded under 40 CFR §280.10(b) and UST systems subject to RCRA Subtitle C corrective action requirements under Section 3004(u) of RCRA, as amended.		Appl	√	Risk-based closures are to be performed for USTs with media contamination as integrated with the CERCLA soil remediation activities.	Risk-based soil cleanup levels, known as FRLs, are established in the RODs. Following sections of the Sitewide Excavation Plan: 2.1.1.2 Underground Storage Tanks 2.2.6 UST Closure 4.0 Location-Specific Excavation Approaches App F Implementation of Construction
CLOSURE OF HAZARDOUS WASTE MANAGEMENT UNITS						
OEPA Closure Plan Review Guidance for RCRA Facilities (Interim Final) September 1, 1993	Federal Regulations of May 2, 1986 (50 FR 16422) and March 19, 1987 (52 FR 8704) modified the closure performance standard such that risk assessment, or what constitutes "decontamination" of a site, may be considered by EPA as a closure option. On December 8, 1988 (see OAC 3745-67-28), the OEPA adopted the equivalent of the EPA's March 19, 1987 regulations, clarifying that risk assessment may be a closure option. It is OEPA and its Division of Hazardous Waste Management (DHWM) practice to consider risk assessment/risk-based closure as a possible third option for closure for all types of units [hazardous waste management units (HWMUs) and solid waste management units (SWMUs)].		TBC	√	Risk-based closures are to be performed for HWMUs with media contamination as integrated with the CERCLA soil remediation activities (see following entry).	Risk-based soil cleanup levels, known as FRLs, are established in the RODs. Following sections of the Sitewide Excavation Plan: 2.1.1.1 Hazardous Waste Management Units 2.2.5 HWMU Closure 4.0 Location-Specific Excavation Approaches App F Implementation of Construction

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
RCRA/CERCLA Integrated Closure Director's Final Findings and Orders (June 4, 1996) Section V.1	The Respondent ... shall comply with the closure regulations contained in OAC rules 3745-66-11(A) and (B), 3745-66-11(C) as applicable, 3745-66-14, and 3745-66-16 through 3745-66-20 as applicable for the HWMUs [hazardous waste management units] listed in Attachment A [to these Orders].		√	√	Pertinent to closures of HWMUs presented in Table 2-1 of the Sitewide Excavation Plan (derived from the DF&O's Attachment A) during the CERCLA soil remediation activities	See subsequent entries in this table for those OAC rules determined by the RODs as ARARs. While OAC 3745-66-11 and -14 are presented in the next two entries, entries for 3745-66-16 through -20 for post-closure are addressed in the subsequent Post-Closure presentation group of this table.
RCRA/CERCLA Integrated Closure Director's Final Findings and Orders (June 4, 1996) Section V.1	The Respondent ... shall comply with the closure regulations contained in OAC rules 3745-66-11(A) and (B), 3745-66-11(C) as applicable, 3745-66-14, and 3745-66-16 through 3745-66-20 as applicable for the HWMUs [hazardous waste management units] listed in Attachment A [to these Orders].		√	√	Pertinent to closures of HWMUs in preceding entry during the CERCLA soil remediation activities.	See preceding and subsequent entries.
Closure and Post-Closure Under Interim Standards Closure Performance Standard OAC 3745-66-11 [40 CFR §265.111]	The owner or operator shall close his facility or hazardous waste management unit (HWMU) in a manner that: (A) minimizes the need for further maintenance; (B) controls, minimizes, or eliminates, to the extent necessary to protect public health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and (C) complies with these closure requirements.	√	Appl	Appl	Pertinent to closures of HWMUs during the CERCLA soil remediation activities; also cited in RCRA/CERCLA Integrated Closure DF&O @ V.1. **NOTE:** These requirements are the same as those for new hazardous waste facilities under OAC 3745-55-11 (40 CFR §264.111). **NOTE:** DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	Following sections of the Sitewide Excavation Plan: 2.1.1.1 Hazardous Waste Management Units 2.2.5 HWMU Closure 4.0 Location-Specific Excavation Approaches App F Implementation of Construction

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	CLOSURE OF HAZARDOUS WASTE MANAGEMENT UNITS, continued					
Closure and Post-Closure Under Interim Standards Disposal or Decontamination of Equipment, Structures and Soils OAC 3745-66-14 [40 CFR §265.114]	During the partial and final closure periods, all contaminated equipment, structures, and soils must be properly disposed of or decontaminated [to risk-based cleanup levels] [i.e., clean closed, have risk-based closure, or be closed in place], unless otherwise specified in: OAC 3745-66-97 Closure and Post-Closure Under Interim Standards: [Tank System] Closure and Post-Closure Care OAC 3745-67-28 Surface Impoundments: Closure and Post-Closure Care OAC 3745-67-58 Surface Impoundments: [Waste Piles] Closure and Post-Closure Care OAC 3745-67-80 Surface Impoundments: [Land Treatment Facility] Closure and Post-Closure Care OAC 3745-68-10 Landfills, Incinerators, Thermal Treatment, Miscellaneous Units: Closure and Post-Closure	√	Appl	Appl	Pertinent to closures of the identified HWMUs during the CERCLA soil remediation activities; also cited in RCRA/CERCLA Integrated Closure DF&O @ V.1. **NOTE:** These requirements are the same as those for new hazardous waste facilities under OAC 3745-55-14 (40 CFR §264.114), with corresponding cross-references presented therein.	Risk-based soil cleanup levels, known as FRLs, are established in the RODs. Also see preceding entry.
Surface Impoundments: [Surface Impoundments] Closure and Post-Closure Care OAC 3745-67-28	At closure of a surface impoundment HWMU, the owner or operator must remove or decontaminate [to risk-based cleanup levels] all waste residues, contaminated waste containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate. If the owner or operator demonstrates that not all contaminated soils can be practically removed or decontaminated [to risk-based cleanup levels], he must close the HWMU and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills under OAC 3745-66-10 to 3745-66-20 and OAC 3745-68-10 (40 CFR §264.310).		√	√	Pertinent to closure of surface impoundment HWMUs during the CERCLA soil remediation activities, as cited in a preceding entry. **NOTE:** These requirements are the same as those for new hazardous waste facilities under OAC 3745-56-28 (40 CFR §264.228).	See preceding.
Hazardous Waste New Facility Corrective Action, Closure and Post-Closure Requirements [Container Storage Area] Closure OAC 3745-55-78 [40 CFR §264.178]	At closure of a container storage area HWMU, the owner or operator must remove all hazardous waste and hazardous waste residues from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be removed or decontaminated [to risk-based cleanup levels].	√	R&A	√	Pertinent to closures of container storage area HWMUs during the CERCLA soil remediation activities **NOTE:** There are no corresponding requirements for interim status hazardous waste facilities under OAC 3745-65, -66, or -67 (40 CFR Part 265).	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Landfills, Incinerators, Thermal Treatment, Miscellaneous Units: Closure and Post-Closure OAC 3745-68-10(A) [40 CFR §265.310(a)]	At final closure of a HWMU as a landfill ... the owner or operator must cover the HWMU ... with a final cover designed and constructed to: • provide long-term minimization of migration of liquids through the closed HWMU; • function with minimum maintenance; • promote drainage and minimize erosion or abrasion of the cover; • accommodate settling and subsidence so that the cover's integrity is maintained; and • have a permeability less than or equal to the permeability of any bottom liner system or natural subsoil present.	✓	R&A	✓	Pertinent to HWMUs that are "closed in place" — i.e., all contaminated soils can not practically be removed or decontaminated [to risk-based cleanup levels] — during the CERCLA soil remediation process. **NOTE:** DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs rather than close in-place (close as a landfill).	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	CLOSURE OF HAZARDOUS WASTE MANAGEMENT UNITS, continued					
RCRA/CERCLA Integrated Closure Director's Final Findings and Orders (June 4, 1996) Section V.2 in lieu of Closure and Post-Closure Under Interim Standards Closure Plan; Amendment of Closure Plan OAC 3745-66-12	The Respondent ... are hereby exempted from complying with OAC rule 3745-66-12 for the HWMUs identified in Attachment A of these Orders, provided that the Respondent: a. Submits the documents contained in Attachment C [of these Orders] to Ohio EPA in accordance with the dates established pursuant to the ACA [Amended Consent Agreement]. Within one week after submitting these documents to Ohio EPA, the Respondent shall submit a cross-reference index which contains pertinent page and section identifications for each HWMU that is contained in the documents and said index shall be cumulative and reference all previous document locations. ... d. Implements the final remedies as reflected in the Records of Decision issued in accordance with the ACA.		√	√	Pertinent to closures of HWMUs listed in preceding entries (see Table 2-1 of the Sitewide Excavation Plan, derived from the DF&O's Attachment A) during the CERCLA soil remediation activities. DOE will submit the cross-reference index for the listed HWMUs accordingly.	Following sections of the Sitewide Excavation Plan: 2.1.1.1 Hazardous Waste Mangement Units 2.2.5 Hazardous Waste Management Unit Closure 3.3.1.3 Treatment, Special Handling and Disposal Options. 3.4.7 Certification Reports

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	RADIONUCLIDE CONCENTRATIONS					
Radiation Protection of the Public and the Environment DOE Order 5400.5 Chapter I (4) and Chapter II (2)	An "as low as reasonably achievable (ALARA)" process is to be used in planning and carrying out all DOE activities that have the potential to cause radiation exposure to the public. ALARA requires judgement with respect to what is reasonably achievable. Factors that relate to societal, technological, economic, and other public policy considerations shall be evaluated to the extent practicable. Factors to be considered, at a minimum, include: • Maximum dose to members of the public; • Collective dose to the population; • Alternative processes, such as alternative treatment of discharge streams, operating methods, or controls; • Doses for each process alternative; • Cost for each of the technological alternatives; • Examination of the changes in cost among alternatives; and • Changes in societal impact associated with process alternatives (e.g., differential doses from various pathways). Except for meeting requirements of NEPA, qualitative analyses are acceptable, in most instances, for ALARA judgements, especially when the potential doses are well below the dose limit. The bases for these judgements should be documented. More detailed analyses should be considered if the decision might result in doses that approach the limit.	TBC	TBC		In addition to the evaluations conducted as part of the CERCLA selection of remedy process [the short- and long-term risk assessments of the Comprehensive Remedial Action Risk Evaluation (CRARE) within the feasibility studies (FSs)], documentation of "equivalent evaluations" for environmental ALARA are performed in accordance with the "FEMP Environmental ALARA Plan" and retained as part of the site and project records. Also addressed through the approved selected remedy in the RODs. An ALARA goal is set in the OU5 ROD for the total uranium FRL.	Following sections of the Sitewide Excavation Plan: 2.1.3 Final Remediation Levels 2.1.5.2 Radiological Hot Spots 2.1.5.3 ALARA Requirements 2.2.2 Certifying FRL Attainment 2.2.3 Detection of and Criteria for Hot Spots 3.3.1.4 ALARA Implementa-tion 3.3.3 Precertifica-tion Activities 3.4.6 Implementa-tion Strategy for Hot Spot Criteria 3.4.7 Certification Report

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	RADIONUCLIDE CONCENTRATIONS, continued					
Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Subpart B— Standards for Cleanup of Land and Buildings Contaminated with Residual Radioactive Materials from Inactive Uranium Processing Sites 40 CFR §192.12(a) Subpart C— Implementation 40 CFR §192.20	Remedial actions shall be conducted so as to provide reasonable assurance that, as a result of residual radioactive materials, the concentration of radium-226 in land averaged over any area of 100 m^2 shall not exceed the background level by more than: • 5 pCi/g averaged over the first 15 cm of soil below the surface, and • 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface. Compliance with this requirement should be shown through measurements performed within the accuracy of currently available types of field and laboratory instruments in conjunction with reasonable survey and sampling procedures.	R&A	R&A	R&A	Met through the selection of FRLs based on risk assessment, followed by certification of cleanup. The selected remedy in the OU2 and OU5 RODs established more stringent clean-up levels for radium-226 of 1.7 pCi/g, as opposed to 5.0 pCi/g above background.	See preceding.
Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Subpart C— Implementation 40 CFR §192.21(f) and §192.22(b)	Where radionuclides other than radium-226 and its decay product are present in sufficient quantity and concentration to constitute a significant radiation hazard from residual radioactive materials, remedial actions shall, in addition to satisfying the standards of Subpart A in 40 CFR §192.02 and Subpart B in 40 CFR §192.12 (both listed above), reduce other residual radioactivity to levels that are ALARA.	R&A	R&A	R&A	The approved selected remedy in the OU5 ROD set an ALARA goal for the total uranium FRL.	See preceding.
Postclosure Standards for Uranium and Thorium Mill Tailings, Subpart D— Standards for the Management of Uranium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended 40 CFR §192.32 (b)(2)	The requirements for the management of uranium byproduct materials after closure of a disposal area [40 CFR §192.32(b)(1)] shall not apply to any portion of a disposal site which contains a concentration of radium-226 in land, averaged over areas of 100 m^2, which, as a result of uranium byproduct material, does not exceed the background level by more than the limits specified in 40 CFR §192.12(a) (see above).	R&A	R&A	R&A		See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Management of Thorium Mill Tailings, Subpart E— Standards for the Management of Thorium Byproduct Materials Pursuant to Section 84 of the Atomic Energy Act of 1954, as Amended 40 CFR §192.40 - §192.42	The following are requirements for the management of thorium byproduct materials: • The provisions for the management of uranium byproduct material (40 CFR §192.32) shall apply to thorium byproduct material and: - Provisions applicable to the element uranium shall also apply to the element thorium - Provisions applicable to radon-222 shall also apply to radon-220 - Provisions applicable to radium-226 shall also apply to radium-228 With the concurrence of EPA, alternative provisions may be substituted for any of the above requirements provided the alternative provisions will provide at least an equivalent level of protection for human health and environment.	R&A	R&A	R&A		See preceding.
Radiation Protection of the Public and the Environment, DOE Order 5400.5 Chapter IV (4)(a)	Guidelines for residual concentrations of radionuclides other than thorium and radium shall be derived from the basic dose limits by means of an environmental pathway analysis using specific property data where available. Procedures for these derivations are given in DOE/CH-8901. Residual concentrations of radioactive material in soil are defined as those in excess of background concentrations averaged over an area of 100 m^2.	TBC			Considered in the development of the selected remedy in the OU2 and OU5 RODs.	See preceding.
Radiation Protection of the Public and the Environment, DOE Order 5400.5 Chapter IV (4)(a)(1) 10 CFR Part 834 (PROPOSED)	If the average residual concentration of radionuclides in any surface or below- surface area less than or equal to 25 m^2 exceeds the limit or guideline by a factor of $(100/A)^{0.5}$ [where A is the area (in square meters) of the region in which the concentrations are elevated], limits for "hot spots" shall also be developed and applied. Procedures for calculating these hot spots limits, which depend on the extent of the elevated local concentrations, are given in DOE/CH-8901. In addition, reasonable efforts shall be made to remove any source of radionuclide that exceeds 30 times the appropriate limit in the soil, irrespective of the average concentration in the soil.	TBC	TBC			See preceding.

RADIONUCLIDE CONCENTRATIONS, continued

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Radiation Protection of the Public and the Environment, DOE Order 5400.5 Chapter IV (4)(a)(2)(3) 10 CFR Part 834 (PROPOSED)	The generic guidelines for residual concentrations of radium-226, radium-228, thorium-230, and thorium-232 are: • 5 pCi/g, averaged over the first 15 cm of soil below the surface; and • 15 pCi/g, averaged over 15-cm-thick layers of soil more than 15 cm below the surface. These guidelines take into account ingrowth of radium-226 from thorium-230 and of radium-228 from thorium-232, and assume secular equilibrium. If both thorium-230 and radium-226, or both thorium-232 and radium-228, are present and not in secular equilibrium, the appropriate guideline is applied as a limit for the radionuclide with the higher concentration. If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that either the dose for the mixture will not exceed the basic dose limit or the sum of the ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide will not exceed 1. Explicit formulas for calculating residual concentrations guidelines for mixtures are given in DOE/CH-8901.	TBC	TBC		Included as it is more restrictive than the federal standard in 40 CFR §192.02, .12(a), .20, .21(f), .22(b), .32(b)(2), .40-.42.	See preceding.
Guidelines for Residual Radioactive Material—Surface Contamination DOE Order 5400.5 Chapter IV (4)(d) 10 CFR Part 834 (PROPOSED)	These generic surface contamination guidelines are applicable to existing structures and equipment. These guidelines are generally consistent with standards of the NRC (1982) and functionally equivalent to Section 4, "Decontamination for Release for Unrestricted Use," of Regulatory Guide 1.86, but apply to nonreactor facilities. These limits apply to both interior equipment and building components that are potentially salvageable or recoverable scrap. If a building is demolished, the guidelines in paragraph IV (6)(a) are applicable to the resulting contamination in the ground.		TBC		Will be used for any process facility building or structures built and/or used for the remedial action, including the AWWT, soil staging, etc.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	LEAD CONCENTRATION					
Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, OSWER Directive # 9355.4-12 (July 14, 1994)	EPA recommends using 400 ppm soil lead as a screening level for lead in soil for residential scenarios at CERCLA sites and at RCRA Corrective Action sites. Residential areas with soil lead below 400 ppm generally require no further action. Site-specific preliminary remediation goals (PRGs) at CERCLA sites and media cleanup standards at RCRA corrective action facilities for residential land use are described.	TBC	TBC		The selected remedy in the OU2 and OU5 RODs established this value as the lead FRL.	Following section of the Sitewide Excavation Plan: 2.1.3 Final Remediation Levels
	PCB CONCENTRATION					
Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, And Use Prohibitions, Subpart A— Applicability, Definitions 40 CFR §761.3	PCB materials which appear at concentrations less than 50 ppm are excluded from the PCB disposal requirements in this regulation.	R&A	√	R&A	Operable Unit 2 does not contain PCB materials which have a concentration greater than 50 mg/kg (ppm by weight).	Following sections of the Sitewide Excavation Plan: 2.5.8 Special Materials 3.3.2.2 Special Materials F.4.1 Materials Which Require Special Handling
Subpart G— PCB Spill Cleanup Policy, Requirements for PCB Spill Cleanup 40 CFR §761.125(c)	PCBs at a concentration of greater than 50 mg/kg (ppm by weight) are subject to TSCA decontamination requirements in 40 CFR §761.120(b). Soil in restricted access areas contaminated by a PCB spill shall be cleaned to 25 mg/kg PCBs [40 CFR §761.125(c)(3)(v)]. At such times as restricted access areas (other than outdoor electrical substations) are converted to another use, the spill site shall be cleaned up to the non-restricted access area requirements of 40 CFR §761.125(c)(4)(v). Soils in non-restricted access areas contaminated by a PCB spill shall be cleaned to 10 mg/kg PCBs, provided that the soil is excavated to a minimum depth of 10 inches. The excavated soil will be replaced with clean soil (i.e., containing less than 1 mg/kg PCBs), and the spill site will be restored (e.g., replacement of turf) [40 CFR §761.125(c)(4)(v)].		TBC	TBC	Soil containing PCBs will be excavated as necessary to attain FRLs; soil concentrations are expected to be less than 50 mg/kg PCBs. The OU5 ROD established FRLs for the PCBs Arochlor-1254 and Arochlor-1260 as 0.13 mg/kg.	Following section of the Sitewide Excavation Plan: 2.1.3 Final Remediation Levels
Subpart G— PCB Spill Cleanup Policy, Sampling Requirements 40 CFR §761.130	Criteria that the EPA uses to determine the adequacy of the cleanup of spills resulting from the release of regulated PCB materials at concentrations of ≥50 mg/kg. Applies to spills which occur after May 4, 1987.			TBC	Applies to spills of regulated PCB materials (i.e., those that have a concentration ≥50 mg/kg) that occurred after May 4, 1987.	See preceding

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	CERTIFICATION OF CLEANUP					
Methods for Evaluating the Attainment of Cleanup Standards, Volume 1: Soils and Solid Media EPA 230/02-89-042 NTIS PB89-234959 February 1989	This EPA guidance document describes methods for testing whether soil chemical concentrations at a site are statistically below a cleanup standard or ARAR. If it can be reasonably concluded that the remaining soil or treated soil at a site has concentrations that are statistically less than relevant cleanup standards then the site can be judged protective of human health and the environment.	TBC	√			Following sections of the Sitewide Excavation Plan: 2.2.2 Certifying FRL Attainment 3.4 Certification App G Certification Design Rationale
RCRA/CERCLA Integrated Closure Director's Final Findings and Orders (June 4, 1996) Section V.4 in lieu of Closure and Post-Closure Under Interim Standards Certification of Closure OAC 3745-66-15	For the HWMUs identified in Attachment A of these Orders, the Respondent ... are hereby exempted from complying with OAC rule 3745-66-15 provided that they submit Remedial Action Reports for the HWMUs contained in operable units 1, 3, and 5 within 60 days from completion of remedial activities at each operable unit, which is determined by the U.S. EPA, in accordance with CERCLA. These Remedial Action Reports shall certify that the HWMUs contained in operable units 1 and 3 have been closed, and that the environmental media in operable unit 5 has been managed, in accordance with the final remedies contained in the Records of Decision and in accordance with the Director's closure performance standards. Attachment C [of these Orders] summarizes the documents that will be provided during remediation process. These CERCLA documents contain the substantive requirements of the RCRA and Ohio hazardous waste closure regulations.		√	√	Pertinent to closures of HWMUs listed in preceding entries (from Table 2-1 of the Sitewide Excavation Plan, derived from the DF&O's Attachment A) during the CERCLA soil remediation activities.	Following sections of the Sitewide Excavation Plan: 2.2.5 HWMU Closure 3.4 Certification 7.3 Certification Design Letter 7.4 Certification Report 7.5 Other Related Future Documents

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
IMPACTED MATERIAL MANAGEMENT						
	DEFINITIONS & GENERAL FACILITY STANDARDS					
Resource, Conservation, and Recovery Act 42 U.S.C. §6903 (27)	Solid waste means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities, but does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954.	Appl	√	√		Following sections of the Sitewide Excavation Plan: 3.0 General Implementation Approach App F Implementation of Construction
Solid Waste and Infectious Waste Regulations, Definitions OAC 3745-27-01 (B)(40)	Solid wastes means such unwanted residual solid or semisolid material as results from industrial, commercial, agricultural, and community operations, *excluding earth or material from construction, mining, or demolition operations, or other waste materials of the type that would normally be included in demolition debris, nontoxic flyash, spent nontoxic foundry sand, and slag and other substances that are not harmful or inimical to public health*, and includes, but is not limited to, garbage, tires, combustible and noncombustible material, street dirt, and debris. Solid waste does not include any material that is an infectious waste or a hazardous waste. For the purpose of this definition, "semisolid material" does not contain liquids which can be readily released under normal climatic conditions, as determined by method 9095 (paint filter liquids test) in SW-846: "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods".	Appl	√	√		See preceding.
Solid Waste and Infectious Waste Regulations, Definitions OAC 3745-27-01 (B)(15) OAC 3745-27-30 (A), (E), (H) ORC 3734.021 (A)(1)(c), (d)	Infectious waste is defined by nine categories of waste including human blood specimens and blood products, sharp wastes used in the treatment or inoculation of human beings, and any other waste materials generated in the diagnosis, treatment, or immunization of human beings. A generator who places all sharp infectious wastes and all unused hypodermic needles, syringes, and scalpel blades into a "SHARPS" container before they are transported and who generates less than 50 lbs. of infectious wastes each month and does not hold a certificate of registration as a generator of infectious wastes may transport and dispose of infectious wastes in the same manner as solid wastes. Treated infectious wastes can be transported and disposed in the same manner as noninfectious waste. Infectious waste that is also radioactive shall be managed in accordance with applicable Ohio Department of Health and U.S. Nuclear Regulatory Commission regulations.	Appl	√			See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DEFINITIONS & GENERAL FACILITY STANDARDS, continued					
Identification and Listing of Hazardous Waste, Definition of Hazardous Waste OAC 3745-51-03(A) [Identification and Listing of Hazardous Waste, Subpart A—General, Definition of Hazardous Waste 40 CFR §261.3(a)]	A solid waste is a hazardous waste, if: (1) it is not excluded from regulation as a hazardous waste under OAC 3745-51-04(B) [40 CFR §261.4(b)]; and (2)(a) it exhibits any of the characteristics of hazardous waste identified in OAC 3745-51-20 to 3745-51-24, with certain exceptions noted therein; or (2)(b) it is listed as hazardous waste in OAC 3745-51-31 to 3745-51-33 [40 CFR §§ 261.30 - 261.35]; or (2)(c) it is a mixture of solid and hazardous wastes; (2)(d) it is a mixture of hazardous wastes as defined in OAC 3745-51-03(A)(2)(a) to 3745-51-03(A)(2)(c) [three previous bullets in this entry] and source material, special nuclear material, or by product material, as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., or other radionuclides. However, only the hazardous components of the mixture are subject to regulation for purposes of this [OAC 3745-51] chapter. (2)(e) Wastewater mixed with a RCRA F-listed spent solvent waste, whose concentration is less then the following *de minimis* levels before *or* at introduction to the headworks of a Clean Water Act-regulated system, *is not a listed hazardous waste*: 1 mg/L: carbon tetrachloride; tetrachloroethene; and trichloroethene. 25 mg/L: the remaining listed spent solvents.	Appl	√	√	This Hazardous Waste Mixture Rule Exclusion is pertinent to management of perched water and other remediation-generated wastewaters, particularly near the Fire Training Facility (HWMU 1) and Sludge Drying Beds (HWMU 41).	See preceding. Following section of the Sitewide Excavation Plan: 2.5.4 Perched Water
Identification and Listing of Hazardous Waste, Exclusions OAC 3745-51-04(B)(4) [Identification and Listing of Hazardous Waste, Subpart A—General, Exclusions 40 CFR §261.4(b)(4)]	The following are not hazardous wastes: fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels.	Appl	√	√		See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Identification and Listing of Hazardous Wastes, Requirements for Recyclable Materials OAC 3745-51-06(A)(3) [40 CFR §261.6]	The following recyclable materials are not subject to regulation under rules 3745-50-40 to 3745-50-62 or Chapters 3745-52 to 3745-57 and 3745-65 to 3745-69 of the Ohio Administrative Code [Parts 262 through 266 or 268, 270, or 124 of 40 CFR], and are not subject to the notification requirements of Chapter 3734 of the Ohio Revised Code [Section 3010 of RCRA]: (b) used batteries (or used battery cells) returned to a battery manufacturer for regeneration; (c) used oil that exhibits one or more of the characteristics of hazardous waste but is recycled in some other manner than being burned for energy recovery; (d) scrap metal.	√	√	Appl	Pertinent to remediation generated materials. Recycling of remediation generated materials may be conducted.	Operable Unit 3 Integrated RD/RA Work Plan
Termination of Operating Licenses for Nuclear Reactors Section C.4 Decontamination for Release for Unrestricted Use U.S. Nuclear Regulatory Commission Regulatory Guide 1.86 (June 1974)	A reasonable effort shall be made to eliminate residual surface radiological contamination and to achieve the acceptable surface contamination levels stated in this guide.	√	√	TBC	Pertinent to releasing to off-site any potentially radiologically-contaminated materials. Radiation surveys will be performed prior to releasing any potentially radiologically-contaminated materials off-site to demonstrate compliance with the surface contamination levels stated in this guide.	Operable Unit 1 Design Criteria Package
Identification and Listing of Hazardous Waste, Subpart A—General, Definition of Hazardous Waste 40 CFR §261.3	Debris means solid material exceeding a 60-mm particle size that is intended for disposal and that is a manufactured object, plant or animal matter, or natural geologic material.	√	Appl	Appl	Applicable to hazardous debris that will be disposed of off-site.	Operable Unit 1 Design Criteria Package, and following sections of the Sitewide Excavation Plan: 1.3.2.4 Remediation Debris 2.5.10 Off-Site Shipments F.5.2 Off-Site Disposal

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
DEFINITIONS & GENERAL FACILITY STANDARDS, continued						
Land Disposal Restrictions, Subpart A—General, Definitions Applicable to This Part 40 CFR §268.2	Hazardous debris means debris that contains a listed hazardous waste, or that exhibits a characteristic of hazardous waste.	√	Appl	Appl	"contains a listed hazardous waste" portion is not applicable to on-property disposal within a CAMU under the CAMU Rule as invoked under the OU5 ROD.	See preceding.
Hazardous Waste Regulations Contained-In Policy 58 FR 48092 (September 14, 1993) Proposed rule. 58 FR 59976 (November 12, 1993) Notice to extend comment. 59 FR 10778 (March 8, 1994) Clarification, partial withdrawal.	Hazardous soil means soil that contains RCRA hazardous waste(s) listed in Subpart D of 40 CFR Part 261, or that exhibits one or more of the characteristics of a hazardous waste as defined in Subpart C of 40 CFR Part 261. This proposed rule recommends contained-in determinations for hazardous debris, hazardous soil and other environmental media. Any person may petition the Regional Administrator to exclude, under 261.3(f)(2) or 261.3(g) of this chapter, hazardous debris and hazardous soil or other environmental media, including but not limited to groundwater, surface water, and sediment, from regulation as hazardous waste. The petition for a contained-in determination must include information sufficient to demonstrate that specific constituent concentrations in the hazardous debris, hazardous soil, or other environmental media to be excluded do not pose a hazard to human health and the environment at that site. (Such a petition is not necessary for remedial actions conducted pursuant to RCRA or CERCLA authorities provided that a similar determination is made by the Regional Administrator based on substantially equivalent information including public notice and comment requirements).		TBC	TBC	Will be considered for managing treated soil that is contaminated with RCRA waste.	Addressed in the selected remedy in the OU5 ROD. Following sections of the Sitewide Excavation Plan: 3.3 Remedial Action App F Implementation of Construction
Ohio Petroleum Contaminated Soil Policy OEPA Policy PP.01-03-200	The basis of the "contained in" policy is that environmental media, such as soil or groundwater, are not considered to be waste material. Because they are not a solid waste, the mixture rule, as set forth in OAC 3745-51-03, does not apply when they become contaminated with a listed hazardous waste but only contains the waste. The result of this policy is that if the waste constituents can be removed, the soil is no longer considered to contain a hazardous waste. Therefore, since soil is not a waste material it does not have to be de-listed in order for it to be used for its intended purpose. However, as long as the soil contains the waste material, it must be managed as a hazardous waste. If this concept is applied to petroleum-contaminated soil, the soil containing a petroleum hydrocarbon would not need to be managed as a solid waste if the contaminants were removed.	TBC	TBC		Allows for treated/clean soil to be used as backfill. Thus, any soil below FRLs can be backfilled or otherwise used as clean soil.	See preceding.
DEFINITIONS & GENERAL FACILITY STANDARDS, continued						

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Hazardous Waste Management System: General, Subpart B—Definitions 40 CFR §260.10	Remediation waste means all solid and hazardous waste, and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under 40 CFR §264.101 and RCRA section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA sections 3004(v) or 3008(h) for releases beyond the facility boundary.	R&A	√	√	Under the Consent Agreement as amended in 1991 (a.k.a., the ACA), remediation at the FEMP is conducted under the authorities of CERCLA as well as RCRA sections 3004(v) and 3008(h).	Following sections of the Sitewide Excavation Plan: 1.3.2.1 Soil and Sediment 1.3.2.6 Corrective Action Management Unit Rule 2.1 Remediation Drivers 2.2.1 Demonstrating OSDF WAC Attainment
CERCLA Compliance with Other Laws Manual Section 2.7	Placement/disposal of waste does not occur under the following circumstances: • waste is consolidated within a unit (including an area of contamination that can be viewed as a single unit); • waste is capped in place, including grading prior to capping; • waste is treated in situ; and • waste is processed within the unit in order to improve its structural stability for closure or for movement of equipment over the area.	TBC	√	TBC	See following entry on the Corrective Action Management Unit.	See following entry.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-References
	DEFINITIONS & GENERAL FACILITY STANDARDS, continued					
Corrective Action Management Unit Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart S- 40 CFR §264.552 (58 FR 865829, February 16, 1993)	For the purpose of implementing remedies under Sec. 264.101 or RCRA Section 3008(h), the EPA Regional Administrator may designate an area at the facility as a corrective action management unit (CAMU). One or more CAMUs may be designated at a facility under the following conditions: 1) Emplacement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes. 2) Consolidation or emplacement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements. 3) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies. 4) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to the wastes. 5) The CAMU shall include uncontaminated areas of the facility only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility. 6) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable. 7) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and applicable. 8) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU. 9) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU. The owner/operator shall provide sufficient information to enable the Regional Administrator to designate a CAMU in accordance with the criteria in Sec. 264.552. Note: RCRA regulated units (HWMUs) within a CAMU are fully subject to RCRA closure regulations.	R&A	Appl	R&A	Per the selected remedy in the OU5 ROD: • the FEMP property (bounded by its property boundaries) is designated as a CAMU; • consolidation or management of on-site remediation wastes into or within the CAMU does not constitute creation of a unit subject to minimum technology requirements (MTRs) [OAC 3745-68-101 and 40 CFR §265.301(a)] and does not invoke land disposal restrictions (LDRs)[OAC 3745-59 and 40 CFR §§268.40 through .44].	Section 9.1.8 of the OU5 ROD, and following section of the Sitewide Excavation Plan: 1.3.2.6 Corrective Action Management Unit Rule

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DEFINITIONS & GENERAL FACILITY STANDARDS, continued					
Generator Standards, Hazardous Waste Determination OAC 3745-52-11(A) through (F)	A person who generates a solid waste must determine if that waste is a hazardous waste using the following method:	✓	R&A	R&A		Following sections of the Sitewide Excavation Plan: 2.1.1 RCRA 2.1.2 Waste Acceptance Criteria 3.1 Predesign Investigation 3.3.1 Implementation of Construction, Excavation, and Material-handling Activities 3.3.2 Impacted Materials Handling and Tracking 3.6 Record Keeping and Information Management
[Standards Applicable to Generators of Hazardous Waste, Subpart A—General, Hazardous Waste Determination 40 CFR §262.11]	1) First determine if the waste is excluded from regulation (not a solid waste) under OAC 3745-51-04 (40 CFR §261.4).					
	2) If the waste is not excluded from regulation, then determine if the waste is listed as a waste ("listed waste") in OAC 3745-51-30 to 3745-51-33 (Subpart D of 40 CFR Part 261).				Not pertinent for on-site disposal because of the CAMU rule (see preceding entry); pertinent for off-site treatment or disposal.	See preceding entry, and following sections of the Sitewide Excavation Plan: 2.5.10 Off-Site Shipments F.5.2 Off-Site Disposal

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	3) For purposes of complying with OAC 3745-59 (40 CFR Part 268), or if the waste is not a "listed waste" per step 2 above, then determine if the waste is a "characteristic waste" as identified in OAC 3745-51-20 through 3745-51-24 (Subpart C of 40 CFR Part 261), by either (a) testing the waste using appropriate methods, or (b) applying knowledge of the hazardous characteristic of the waste in light of the materials or processes used ("process knowledge").				Per the RODs, pertinent only to the following areas: In OU2: approx. 300 cubic yards of lead-containing soil in the South Field Firing Range. In OU5: 1) Abandoned sump west of Pilot Plant; 2) Area between KC-2 Warehouse and RR tracks; 3) Trap Range; 4) Paddy's Run streambank fill materials west of OU4's Silos 1-4; 5) Scrap Metal Pile area; and 6) Area north of maintenance building.	Sections 7.4 (@ p. 7-5), 9.1 (@ p. 9-2), and 10.2.2 (@ p. 10-4) of the OU2 ROD; Section 9.1.1 (@ p. 9-6) and Table 9-1 of the OU5 ROD
Interim [Status Hazardous Waste Facility] Standards —General Provisions, General Provisions OAC 3745-65-13 through -16 [Interim Status Hazardous Waste Facility Standards, Subpart B—General Facility Standards 40 CFR §§265.13 through .16]	Owners/operators of a facility must obtain chemical and physical analyses of a representative sample of each hazardous or nonhazardous waste to be treated, stored or disposed of at the facility prior to treatment, storage or disposal. At a minimum, the analysis must contain all the information which must be known to treat, store or dispose of the waste, and may include using existing published or documented data on the waste or on waste generated from similar processes ("process knowledge") [OAC 3745-65-13].	✓	R&A	R&A	Pertinent to management of hazardous waste.	Following sections of the Sitewide Excavation Plan: 3.3.2 Impacted Materials Handling and Tracking 4.0 Location-Specific Excavation Approaches F.5 Excavated Material Management
	The facility owner/operator must prevent the unknowing entry, and minimize the possibility of unauthorized entry, to the active portion of the facility unless certain conditions apply [OAC 3745-65-14].				Controls which limit access to the FEMP will remain in place throughout remediation activities.	F.2.1 Establishing Excavation Boundaries and Access Controls

DEFINITIONS & GENERAL FACILITY STANDARDS, continued

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	The facility operator must maintain and inspect all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are important to preventing human health hazards. The frequency of inspection may vary by item, and should be based on the rate of possible deterioration of the equipment/item and the probability of an environmental or human health incident if the deterioration, malfunction, or operator error goes undetected [OAC 3745-65-15]. The facility operator must train personnel for procedures relevant to the positions in which they are employed [OAC 3745-65-16].					F.8 Remediation Maintenance Activities
Hazardous Waste Facility Environmental Impact ORC 3734.05(D)(6)(c)	A hazardous waste facility installation and operation permit shall not be approved unless it is proven that the facility represents the minimum adverse environmental impact, considering the state of available technology, the nature and economics of various alternatives and other pertinent considerations	√	Appl	√	NOTE: Incorrectly cited in RODs as OAC 3745.05(D)(6)(c).	Appendix H of OU2 FS, Appendix J of OU5 FS, and Appendix J of OU3 RI/FS.
Hazardous Waste Facility Minimum Risk ORC 3734.05(D)(6)(d)	A hazardous waste facility installation and operation permit shall not be approved unless it is proven that the facility represents the minimum risk of all the following: 1) contamination of groundwater and surface water; 2) fires or explosions from treatment, storage, or disposal methods; 3) accidents during transportation; 4) impact to public health and safety; 5) air pollution; and 6) soil contamination.	√	Appl	√	NOTE: Incorrectly cited in RODs as OAC 3745.05(D)(6)(d).	OU2, OU5, and OU3 FS Reports and RODs. Also, see preceding.
Interim [Status Hazardous Waste Facility] Standards—General Provisions, Preparedness and Prevention OAC 3745-65-31 through -35, and -37 [Interim Status Hazardous Waste Facility Standards, Subpart C—Preparedness and Prevention 40 CFR §§265.31 through .35, and .37]	TSD facility operators must design, construct, maintain and operate facilities to minimize the possibility of fire, explosion or any unplanned sudden or non-sudden release of hazardous waste to air, soil, or surface water which might threaten human health or the environment.	√	R&A	R&A		See two preceding entries. For waste that is dispositioned for off-site disposal, see the Operable Unit 1 Design Criteria Package.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Interim [Status Hazardous Waste Facility] Standards—General Provisions, Contingency Plan and Emergency Procedures OAC 3745-65-51, -52, -55 and -56 [Interim Status Hazardous Waste Facility Standards, Subpart D—Contingency Plan and Emergency Procedures 40 CFR §265.51, .52, .55 and .56]	Each facility operator must have a contingency plan designed to minimize hazards to human health and the environment due to fires, explosions, or any unplanned releases of hazardous waste constituents to air, soil or surface/groundwater.	√	R&A	R&A	Pertinent to on-site facilities that treat, store, or dispose of hazardous waste.	FEMP Emergency Plan (PL-3020); all HWMUs identified in Table 2-1 of the Sitewide Excavation Plan (and the subset identified previously in this table) are addressed in Section G: Contingency Plan of the RCRA Part B Permit Application. Also, see three preceding entries. For waste that is dispositioned for off-site disposal, see the Operable Unit 1 Design Criteria Package.
Hazardous Waste Incinerators [and Miscellaneous Units], Environmental Performance Standards OAC 3745-57-91 and -92 [Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart X—Miscellaneous Units, 40 CFR §§264.601 through .603]	Prevention of any release that may have adverse effects on human health or the environment includes, but is not limited to: A. Migration of waste constituents in the groundwater or subsurface environment. B. Migration of waste constituents in surface water, or wetlands or on the soil surface. C. Migration of waste constituents in the air. Monitoring, tests, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with pertinent portions of the OAC.	√	R&A	√	Pertinent to on-site facilities that treat, store, or dispose of hazardous waste in miscellaneous units unless the CAMU Rule is applied.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Radioactive Waste Management DOE Order 5820.2A Chapter III (3)(d)	Low-level waste shall be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. This characterization shall ensure that, upon generation after processing, the actual physical and chemical characteristics and major radionuclide content are recorded and known during all stages of the waste management process. Waste characterization data shall be recorded on a waste manifest and shall include: • the physical and chemical characteristics of the waste; • volume of the waste (total of waste and any solidification or absorbent media); • weight of the waste (total of waste and any solidification or absorbent media); • major radionuclides and their concentrations; and • packaging date, package weight, and external volume.	TBC	√	TBC	The CERCLA RI/FS process established the nature and extent of contamination at the FEMP. During excavation, monitoring will be performed in accordance with of the Sitewide Excavation Plan and individual IRDPs, and results will be documented in order to determine if impacted material meets the OSDF WACs or offsite WACs. These sources of characterization information (RI/FS sampling, pre-design investigations, FRL attainment, WAC attainment) will provide the required manifest information.	Addressed throughout the CERCLA RI/FS and selection of remedy process, culminated in the OU2, OU5 and OU3 RODs; OSDF Impacted Materials Placement Plan; following section of the Sitewide Excavation Plan: 3.3.2 Impacted Materials Handling and Tracking

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DEFINITIONS & GENERAL FACILITY STANDARDS, continued					
Waste Treatment DOE Order 5820.2A Chapter III (3)(f)	Waste treatment techniques such as incineration, shredding, and compaction to reduce volume and provide more stable waste forms shall be implemented as necessary to meet performance requirements. Use of waste treatment techniques to increase the life of the disposal facility and improve the long-term facility performance, by improved site stability and reduction of infiltrating water, is required to the extent it is cost effective. The development of large scale waste treatment facilities shall be supported by the appropriate National Environmental Policy Act documentation. Operation of waste treatment facilities shall be supported by adequate documentation.	TBC	TBC	TBC	Based upon CERCLA RI/FS data, the majority of the impacted material from OU2, OU5 & OU3 will meet the OSDF WACs and thus the performance objectives of the OSDF & DOE Order 5820.2A without treatment. This has been demonstrated through the modeling performed in the FSs to establish the OSDF WACs. Two categories of impacted materials may need to be treated before disposal. Toxicity characteristic soil from seven areas will be quantified & treated to the extent necessary to remove the toxicity characteristic that cause them to be regulated as hazardous. Physical sizing & treatment as per the OSDF Impacted Material Placement Plan will be conducted as needed on debris for proper waste placement and stability within the OSDF. Some physical treatment might also be necessary for the sludge from the OU2 Lime Sludge Ponds to decrease the moisture content before placement into the OSDF.	Addressed throughout the CERCLA RI/FS and selection of remedy process, culminated in the OU2, OU5 and OU3 RODs; OSDF Impacted Materials Placement Plan; following sections of the Sitewide Excavation Plan: 1.3.2.7 RCRA Characteristic Waste Disposal 2.1.1.3 Toxicity Characteristic Hazardous Wastes 3.3.2 Impacted Materials Handling and Tracking F.5 Excavated Material Management

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DEFINITIONS & GENERAL FACILITY STANDARDS, continued					
Radioactive Waste Management DOE Order 5820.2A Chapter III (3)(g)	The volume of waste and number of shipments of low-level wastes shall be minimized and the shipments will be conducted based on plans developed by field organizations. Generators shall provide an annual forecast in the third quarter of the fiscal year to the field organizations managing the off-site disposal facility to which the waste is to be shipped. Generators must receive advance approval from the receiving facility and shall certify prior to shipment that waste meets the receiving facility waste acceptance criteria. The certification program shall be auditable and able to withstand independent review.	TBC	TBC	TBC	The volume of impacted material to be disposed onsite in the OSDF will be minimized through a number of programs. First, extensive sampling has been performed during the CERCLA RI/FS process and the extent of excavation has been established using this data. Combined with the sampling/monitoring that will be performed during excavation in accordance with Section 3.3 of the Sitewide Excavation Plan and individual IRDPs, this will confirm that only impacted materials are excavated and sent to disposal. Compliance with the FEMP Pollution Prevention and Waste Minimization Awareness Plan will minimize the amount of low-level waste (i.e., equipment and personal protective equipment) generated during remediation.	FEMP Pollution Prevention and Waste Minimization Awareness Plan; also see preceding.
Control of Residual Radioactive Material DOE Order 5400.5 Chapter IV (6)(b) 10 CFR Part 834 (PROPOSED)	Interim storage must provide: 1) Control and stabilization features shall be designed to provide, to the extent reasonably achievable, an effective life of 50 years with a minimum life of at least 25 years.	✓	TBC		The selected remedies are for a permanent remedy, not for interim storage; any short-term management of impacted material to be employed is to facilitate implementation of the permanent remedy.	The approved selected remedy in the OU2 and OU5 RODs, associated remedial design documents (i.e., IRDPs).
	2) Controls shall be designed such that radon-222 concentrations in the atmosphere above facility surfaces or openings in addition to background levels, will not exceed: (a) 100 pCi/L at any given point; (b) An annual average concentration of 30 pCi/L over the facility site; and (c) An annual average concentration of 3 pCi/L at or above any location outside the facility site. (d) Flux rates from the storage of radon producing wastes shall not exceed 20 pCi/m^2/sec, as required by 40 CFR Part 61.					

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	3) Controls shall be designed such that concentrations of radionuclides in the groundwater and quantities of residual radioactive material will not exceed applicable federal or state standards.					Section 5.0 of the Sitewide Excavation Plan, for environmental controls to be implemented during remediation.
	4) Access to a property and use of on-site material contaminated by residual radioactive material should be controlled through appropriate administrative and physical controls such as those described in 40 CFR Part 192. These control features should be designed to provide, to the extent reasonable, an effective life of at least 25 years.					Section 3.0 and Appendix F of the Sitewide Excavation Plan and IRDPs, for access controls to be implemented during remediation.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF LOW-LEVEL RADIOACTIVE MATERIAL					
Low-level Radioactive Waste Generation DOE Order 5820.2A Chapter III (3)(c)	Technical and administrative controls shall be directed to reducing the gross volume of waste generated and/or the amount of radioactivity requiring disposal. Waste reduction efforts shall include consideration of process modification, process optimization, materials substitution, and decontamination. All DOE low-level waste generators shall establish auditable programs to assure that the amount of low-level waste generated and/or shipped for disposal is minimized. Each DOE low-level waste generator shall separate uncontaminated waste from low-level waste to facilitate cost-effective treatment and disposal. Each DOE low-level waste generator preparing a design for a new process or process change shall incorporate principles into the design that will minimize the generation of low-level waste.	TBC	TBC	TBC	Implementation of the FEMP Pollution Prevention and Waste Minimization Awareness Plan will confirm that all newly generated waste is minimized during remediation. Additionally, excavation controls such as rapid test methodology and additional laboratory sampling will be implemented to confirm that only impacted material with contamination that is potentially above the FRLs is being excavated and sent to disposal. Physical sampling of the impacted materials and/or rapid test method methodology will also confirm that only material that exceeds the OSDF WAC is sent offsite for disposal.	Addressed throughout the CERCLA RI/FS and selection of remedy process, culminated in the OU2, OU5 and OU3 RODs; also, FEMP Pollution Prevention and Waste Minimization Awareness Plan.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF HAZARDOUS REMEDIATION WASTE					
Identification and Listing of Hazardous Waste, Residues of Hazardous Waste in Empty Containers OAC 3745-51-07(A) &(B) [Identification and Listing of Hazardous Waste, Subpart A—General, Residues of Hazardous Waste in Empty Containers 40 CFR §261.7]	Any hazardous waste remaining in either an empty container or an inner liner removed from an empty container is not subject to regulation under 40 CFR Parts 261 through 265 (RCRA requirements). A container is empty if: 1) All wastes have been removed that can be removed using the practices commonly employed to remove materials from that type of container (e.g., pouring, pumping, and aspirating); and 2) No more than 2.5 cm (1 inch) of residue remains on bottom of the container or inner liner; or 3) No more than 3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is less than or equal to 110 gal. in size, or no more than 0.3 percent by weight of the total capacity of the container remains in the container or inner liner if the container is greater than 110 gal. in size.	√	R&A	Appl	Pertinent when containerizing: soil contaminated by RCRA waste; any treatment residues exhibiting RCRA characteristics including soil decontamination residues.	Following sections of the Sitewide Excavation Plan: 2.5.8 Special Materials 3.3.2.2 Special Materials App F Implementation of Construction

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF HAZARDOUS REMEDIATION WASTE, continued					
Closure and Post-Closure Under Interim Standards, Condition of Containers OAC 3745-66-71 Compatibility of Containers OAC 3745-66-72 Management of Containers OAC 3745-66-73 Inspections OAC 3745-66-74 Special Requirements for Ignitable or Reactive Waste OAC 3745-66-76 Special Requirements for Incompatible Wastes OAC 3745-66-77 [Interim Status Standards, Subpart I—Use & Management of Containers, 40 CFR §§265.171 through .174, .176 and .177]	If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or begins to leak, the owner or operator must transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with this requirement.	√	R&A	Appl	Pertinent to handling containers holding environmental media contaminated with RCRA waste.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
[New Facilities] Corrective Action, Closure and Post-Closure Requirements Containment OAC 3745-55-75 [Interim Status Hazardous Waste Facility Standards, Subpart I—Use & Management of Containers 40 CFR §§265.175(a) through (c)]	A containment system for RCRA container storage areas must be designed and operated to provide: 1) A sufficiently impervious base, which is sloped to collect any leaking liquids. 2) Sufficient capacity to contain liquids. 3) Prevention of run-on into the containment system. 4) A sump to prevent overflow of the collection system. Storage areas for containers holding only wastes that do not contain free liquids need not have a containment system, provided that: 1) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or 2) The containers are elevated or are otherwise protected from contact with accumulated liquid.	✓	R&A	Appl	Pertinent to handling soil contaminated with RCRA listed or characteristic hazardous waste. A Part B Permit Application for RCRA storage has been submitted to the OEPA.	See preceding.
[New Facilities] Surface Impoundments, Waste Piles, and Tanks [Waste Piles] Design and Operating Requirements OAC 3745-56-51(A) through (F)	A waste pile used to store or treat hazardous waste must have: 1) A liner that is designed, constructed, and installed to prevent any migration of waste out of the pile into the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the waste pile, and 2) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile.	✓	R&A	✓	Pertinent to on-site hazardous waste piles used for longer than 90 days unless the CAMU Rule is applied.	Addressed through remedial design documents (IRDPs).
	The owner/operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the pile during peak discharge from at least a 25-yr storm and manage a runoff management system to collect and control at least the water volume resulting from a 24-hr, 25-yr storm.	✓	R&A	✓		
	If the pile contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the pile to control wind dispersal.	✓	R&A	✓		FEMP Fugitive Dust Control BAT Determination, and Section 5.1.2.2 and Appendix F of the Sitewide Excavation Plan

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF HAZARDOUS REMEDIATION WASTES, continued					
Monitoring and Inspection OAC 3745-56-54(A) and (B)	During construction or installation, liners and cover systems must be inspected for uniformity, damage, and imperfections.	√	R&A	√		
	Collection and holding facilities associated with run-on and runoff control system must be inspected weekly and be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.	√	R&A	√		FEMP Stormwater Pollution Prevention Plan (RM-0039), and Appendix F of the Sitewide Excavation Plan
Special Requirements for Ignitable or Reactive Waste OAC 3745-56-56(A) and (B) Special Requirements for Incompatible Wastes OAC 3745-56-57(A), (B) and (C) [Subpart L—Waste Piles, 40 CFR §§264.251 through .259]	Ignitable, reactive, or incompatible waste must not be added to a waste pile, unless specified in OAC 3745-56-56(A) and (B) or 57(A), (B) and (C).	√	R&A	√	The CERCLA RIs did not find evidence of ignitive or reactive material on-site. Impacted and non-impacted materials management will be segregated and managed in separate piles, based upon intended disposition (waste acceptance criteria).	Following sections of the Sitewide Excavation Plan: 3.3.2 Impacted Materials Handling and Tracking 4.0 Location-Specific Excavation Approaches F.5 Excavated Material Management
Temporary Units Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart S- 40 CFR §264.553 (a), (b) (58 FR 865829, February 16, 1993)	For temporary tanks and container storage areas used for treatment or storage of remediation wastes during remedial activities, the Regional Administrator may determine that a design, operating, or closure standard applicable to such units may be replaced by alternative requirements which are protective of human health and the environment. Any temporary unit to which alternative requirements are applied shall be: • located within the facility boundary; and • used solely for treatment or storage of remediation wastes.	R&A	√	R&A	Pertinent to short-term management/storage of impacted materials during the CERCLA soil remediation activities. IRDPs can designate and utilize temporary units to facilitate remediation within the already designated CAMU. Alternative requirements which are protective of human health and the environment may be used in lieu of the design, operating, or closure requirements that would otherwise apply to such units under RCRA.	Following section of the Sitewide Excavation Plan: 1.3.2.6 CAMU Rule

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Subpart DD—Containment Building 40 CFR §§264.1100 through .1102 57 FR 37194 (August 18, 1992)	The owner or operator is not subject to the definition of land disposal in RCRA Section 3004(k) provided that the unit: 1) Is a completely enclosed, self-supporting structure that is designed and constructed of synthetic materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed, climatic conditions, and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls; 2) Has a primary barrier for management of solids, in addition to a liquid collection system and secondary containment for management of liquids. 3) Has controls sufficient to prevent fugitive dust emissions to meet the no visible emission standard in Sec. 264.1101(c)(1)(iv); and 4) Is designed and operated to ensure containment and prevent the tracking of materials from the unit by personnel or equipment. At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoil, and structures and equipment contaminated with waste and leachate, and handle them as a hazardous waste.	✓	R&A	R&A	Pertinent to excavated RCRA hazardous soil and sediment that may require short-term management/ storage during the CERCLA soil remediation activities. DOE does not anticipate utilizing containment buildings.	Following sections of the Sitewide Excavation Plan: 3.3.2 Impacted Materials Handling and Tracking 4.0 Location-Specific Excavation Approaches F.5 Excavated Material Management

TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF HAZARDOUS REMEDIATION WASTE, continued					
Procedures for Planning and Implementing Offsite Response Actions ("The CERCLA Offsite Rule") 40 CFR §300.400	Materials from remediation of a CERCLA site ("CERCLA waste") may only be transferred to offsite facilities that are in compliance with Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), or other applicable federal and state requirements. Only U.S. EPA has the authority to determine whether the facility in question meets the acceptability criteria and is acceptable for receiving CERCLA waste from offsite. A determination of acceptability for a potential receiving facility is to be made in advance (prior to initiating transportation offsite, and optimally prior to making offsite treatment/ storage/disposal contract arrangements). Materials covered under this rule ("CERCLA waste") are any hazardous substance, pollutant, or contaminant as defined under CERCLA sections 101(14) and 101(33). Samples of waste sent to a laboratory for characterization are exempt from the rule, as are certain treatability study waste. The receiving facility must meet compliance and release criteria presented therein. Facility is defined as the receiving unit(s) that directly stores, treats, or disposes of the CERCLA waste. Non-receiving units at the facility need not be in compliance in order for the U.S. EPA to determine that the receiving unit meets acceptance criteria. U.S. EPA may deem a facility acceptable even if certain minor violations have occurred at the facility. If a facility does not meet the criteria for receiving CERCLA wastes, the rule presents notification, determination, appeal/review and reinstatement procedures.	√	√	Appl	Pertinent to preparation of materials for off-site disposition.	Operable Unit 1 Design Criteria Package, and following sections of the Sitewide Excavation Plan: 2.5.10 Off-Site Shipments F.5.2 Off-Site Disposal
[Hazardous Waste] Generator Standards OAC 3745-52-20 through -23, and -30 through -33 [40 CFR §§262.20 through .23, and .30 through .33]	Before transporting hazardous waste or offering hazardous waste for transportation off-site ("pre-transport"), for either treatment or disposal, general requirements for the generator require a manifest [OAC 3745-52-20 through -23] in accordance with the requirements specified therein. Pre-transport requirements also include appropriate packaging [OAC 3745-52-30], labeling [OAC 3745-52-31], marking [OAC 3745-52-32], and placarding [OAC 3745-52-33], in accordance with the requirements specified therein.	√	Appl	Appl	Pertinent to preparation of RCRA hazardous waste (and mixed waste) for off-site treatment and/or disposal.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Implementation of the United Nations Recommendations, International Maritime Dangerous Goods Code, and the International Civil Aviation Organization's Technical Instructions 59 FR 67390 (December 29, 1994) as amended by 60 FR 26796 (May 18, 1995)	These rules (final rule was effective October 1, 1995) comprehensively revise the Hazardous Materials Regulations (HMR), 49 CFR Parts 171-173, 177, and 178, with respect to hazard communication, classification, and packaging requirements based on United Nations recommendations.	√	√	Appl	These Hazardous Materials Regulations are requirements embedded in both the state (OAC) and federal (CFR) regulations in both the generator standards (preceding entry) and the transporter standards (subsequent entry).	See preceding generator standards entry and subsequent transporter standards entry.
[Hazardous Waste] Land Disposal Restrictions OAC 3745-59 [Land Disposal Restrictions, Subpart D—Treatment Standards 40 CFR §§268.40 through .44]	A restricted hazardous waste may be land disposed only if: 1) An extract of the waste or of the treatment residue of the waste does not exceed the value shown in 40 CFR §268.41. 2) It is treated using a technology specified in 40 CFR §268.42(a) or an equivalent treatment method. 3) The constituent concentrations in the waste or treatment residue of the waste do not exceed the value shown in 40 CFR §268.43.	√	Appl	Appl	Not applicable to on-property disposal within a CAMU under the CAMU Rule as invoked under the OU5 ROD. Applicable to those RCRA hazardous wastes that will be dispositioned off site.	See three preceding entries.
Land Disposal Restrictions, Subpart D—Treatment Standards, Treatment Standards Expressed as Concentrations in Waste Extract 40 CFR §268.41	The maximum concentration of lead (5.0 mg/L) may not be exceeded whether it is the extract of a waste or waste treatment residual.	R&A	Appl		Not applicable to on-property disposal within a CAMU under the CAMU Rule as invoked under the OU5 ROD. Applicable to those RCRA hazardous wastes that will be disposed of off-site.	See four preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	MANAGEMENT OF HAZARDOUS REMEDIATION WASTE, continued					
Land Disposal Restrictions, Subpart D—Treatment Standards, Contaminated Debris 40 CFR §268.45	Hazardous debris must be treated before land disposal unless the EPA determines that the debris is no longer contaminated with hazardous waste or the debris is treated to the waste-specific treatment standard for the waste contaminating the debris. Provided the debris does not exhibit a RCRA characteristic it is not subject to regulation under 40 CFR 260, 261 to 266, 268, or 270 if: 1) The hazardous debris has been treated using one of the required extraction or destruction technologies specified in 40 CFR §268.45; or 2) The debris, considering the extent of contamination, is determined to no longer be contaminated with hazardous waste.	✓	Appl	Appl	Not applicable to on-property disposal within a CAMU under the CAMU Rule as invoked under the OU5 ROD. Applicable to those RCRA hazardous wastes that will be disposed of off-site.	See five preceding entries.
[Hazardous Waste] Transporter Standards OAC 3745-53-20 through -22, -30 and -31 [40 CFR §§263.20 through .22, .30 and .31]	General requirements for the transporter during transportation of hazardous waste for off-site treatment and/or disposal require acceptance and handling of hazardous waste and use of the manifest system [OAC 3745-53-20], compliance with the manifest [OAC 3745-53-21], and recordkeeping [OAC 3745-53-22], in accordance with the requirements specified therein. Appropriate response actions must be taken for any hazardous waste discharge during transportation [OAC 3745-53-30 and -31], in accordance with the requirements specified therein.	✓	Appl	Appl	Pertinent to transportation of RCRA hazardous wastes for off-site treatment and/or disposal.	See six preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
MANAGEMENT OF PCB-TAINTED MATERIAL						
Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, And Use Prohibitions, Subpart D—Storage and Disposal, Disposal Requirements 40 CFR §761.60(a)(4)	Any nonliquid PCBs at concentrations 50 mg/kg or greater in the form of contaminated soil, rags, or other debris shall be disposed of in an incinerator which complies with 40 CFR §761.70, or in a chemical waste landfill which complies with 40 CFR §761.75.		Appl	Appl	Pertinent if soil or other material containing PCBs above 50 mg/kg is excavated. PCBs were detected in soil beneath the Fire Training Facility.	Following sections of the Sitewide Excavation Plan: 3.3.2 Impacted Materials Handling and Tracking 4.0 Location-Specific Excavation Approaches F.5 Excavated Material Management
Subpart D—[PCB] Storage and Disposal, Disposal Requirements 40 CFR §761.60(e)	Any person who is required to incinerate PCBs or PCB items under this subpart and who can demonstrate that an alternate method of destroying PCBs or PCB items can achieve a level of performance equivalent to the requirements under 40 CFR §761.70 may submit a written request to either the Regional Administrator or the Director, Exposure Evaluation Division, for an exemption from the incineration requirements of 40 CFR §§ 761.70 or 761.60. The applicant must show that the alternate method of destroying PCBs will not present an unreasonable risk of injury to health or the environment.		Appl	Appl	Pertinent only if PCB contaminated soil is greater than 50 mg/kg and is treated on-property using a method besides incineration. DOE neither currently anticipates any such material nor on-property treatment for any such material under the soil remediation projects.	See preceding entry, plus following sections of the Sitewide Excavation Plan: 2.5.10 Off-Site Shipments F.5.2 Off-Site Disposal
Subpart D—[PCB] Storage and Disposal, Storage for Disposal 40 CFR §761.65	This section applies to the design of storage areas to be used for later disposal of PCBs at concentrations of 50 ppm (mg/kg or mg/L) or greater.		Appl	Appl	Pertinent to storage of PCB-contaminated material at 50 ppm or greater. DOE does not currently anticipate any such material under the soil remediation projects.	See two preceding entries.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
POST-CLOSURE						
	DESCRIPTION OF POST-CLOSURE CARE					
[New Facilities Hazardous Waste] Surface Impoundments, Waste Piles, and Tanks, [Waste Piles] Post-Closure OAC 3745-56-58(B) [Subpart L—Waste Piles, 40 CFR §§264.251 through .259]	If, after removing or decontaminating all residues and making all reasonable effort to effect removal or decontamination of contaminated components, subsoil, structures and equipment, the owner/operator finds that not all contaminated subsoil can be practically removed or decontaminated, he must close the unit/facility and perform post-closure care in accordance with OAC 3745-57-10. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	R&A		Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	Currently addressed in the OSDF Post-closure Care and Inspection Plan, which notes in its Prologue that it can be revised at a later date to expand the scope of coverage to encompass the entire FEMP site as needed. Will also be addressed in the Certification Report and Remedial Action Report — see following sections of the Sitewide Excavation Plan: 1.4.2 Related Documents 2.2.5 HWMU Closure 3.4.7 Certification Report 3.5.3.6 Postremediation/post-closure Care and Inspection 7.4 Certification Report 7.5 Other Related Future Documents
[New Facilities Hazardous Waste] Incinerators [and Miscellaneous Units], [Miscellaneous Units] Environmental Performance Standards OAC 3745-57-93 [Subpart X—Miscellaneous Units, 40 CFR §§264.601 through .603]	If a treatment or storage miscellaneous unit has contaminated soil or groundwater that cannot be completely removed or decontaminated during closure, the unit must also meet the requirements of OAC 3745-57-91 during the post-closure care period. The post-closure plan under OAC 3745-55-18 must specify the procedures that will be used to satisfy this requirement. A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with OAC 3745-57-91 during the post-closure care period. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	R&A		Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Closure and Post-Closure Under Interim Standards, Post-closure Care and Use of Property OAC 3745-66-17(A) [40 CFR §265.117(a)(2)]	Post-closure care of hazardous waste management units must begin after completion of closure of the unit and continue for 30 years after that date unless shortened by the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] in accordance with OAC 3745-66-18(G) (40 CFR §117(a)(2)). **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	Appl		**NOTE:** Identified in the OU5 ROD as applicable only to existing hazardous waste management units (HWMUs); also cited in RCRA/CERCLA Integrated Closure DF&O @ V.1. Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.
Closure and Post-Closure Under Interim Standards, Post-closure Care and Use of Property OAC 3745-66-17(A)(1) [40 CFR §265.117(a)(1)]	Post-closure care...must consist of at least the following: • monitoring and reporting; and • maintenance and monitoring of waste containment systems. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1. Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DESCRIPTION OF POST-CLOSURE CARE, continued					
Closure and Post-Closure Under Interim Standards, Post-closure Plan; Amendment of Plan OAC 3745-66-18(A)&(C)	The owner of a hazardous waste disposal unit shall have a written post-closure plan, which shall identify the activities that will be carried on after closure of each unit and the frequency of those activities, and include at least: • a description of the planned monitoring activities and frequencies at which they will be performed; • a description of the planned maintenance activities and frequencies at which they will be performed, to ensure (a) the integrity of the cap and final cover or other containment systems, and (b) the functioning of the monitoring equipment; and • the name, address and telephone number of the person or office to contact about the hazardous waste disposal unit or facility during the post-closure period. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1. Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.
	MODIFICATIONS TO POST-CLOSURE CARE PLAN OR PERIOD					
Closure and Post-Closure Under Interim Standards, Post-closure Plan; Amendment of Plan OAC 3745-66-18(D)	The owner may amend the post-closure plan any time during the active life of the facility or during the post-closure period. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1. Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.
Closure and Post-Closure Under Interim Standards, Post-closure Plan; Amendment of Plan OAC 3745-66-18(G)	The post-closure plan and length of the post-closure period may be modified any time prior to the end of the post-closure care period. A modification of the post-closure plan may include, where appropriate, the temporary suspension rather than permanent deletion of one or more post-closure care requirements. At the end of the specified period of suspension, the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] would then determine whether the requirements should be permanently discontinued or reinstated to prevent threats to human health and the environment. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1. Only pertinent to those units where risk-based FRLs are not met. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	PROPERTY USE RESTRICTIONS					
Closure and Post-Closure Under Interim Standards, Post-closure Care and Use of Property OAC 3745-66-17© [40 CFR §265.117(c)]	Post-closure use of property on or in which hazardous waste remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the facility's monitoring systems, unless the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] approves otherwise. **NOTE:** If clean (or risk-based) closure is performed, then post-closure care is not required.	√	Appl	√	**NOTE:** Identified in the OU5 ROD as applicable only to existing hazardous waste management units (HWMUs); also cited in RCRA/CERCLA Integrated Closure DF&O @ V.1. DOE intends, and anticipates being able, to clean (risk-based) close all identified HWMUs.	Currently addressed in the OSDF Post-closure Care and Inspection Plan, which notes in its Prologue that it can be revised at a later date to expand the scope of coverage to encompass the entire FEMP site as needed.
Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings Subpart A— 40 CFR §192.02(a)	Controls of residual radioactive materials from inactive uranium processing sites shall be designed to be effective for up to 1,000 years, to the extent reasonably achievable, and in any case, for at least 200 years, and provide protection of groundwater.	R&A	R&A		Most pertinent to the design and closure of the On-Site Disposal Facility.	Addressed by selected remedies of OU2 and OU5 RODs in establishment of FRLs.
Long-Term Management of Residual Radioactive Material DOE Order 5400.5 Chapter IV (6)(d) 10 CFR Part 834 (PROPOSED)	Controls of residual radioactive materials from inactive uranium processing sites shall be designed to be effective for up to 1,000 years, to the extent reasonably achievable, and in any case, for at least 200 years, and provide protection of groundwater.		TBC			Addressed by selected remedies of OU2 and OU5 RODs in establishment of FRLs.
	For long-term management of uranium, thorium, and their decay products, access to a property and use of on-site materials contaminated by residual radioactive material should be controlled through appropriate administrative and physical controls such as those described in 40 CFR 192. These controls should be designed to be effective to the extent reasonable for at least 200 years.	TBC	TBC			
Control of Residual Radioactive Material Above the Guidelines DOE Order 5400.5 Chapter IV (6)	Residual radioactive material with concentrations above the generic guidelines (see chemical-specific requirements) shall be managed in accordance with Chapter II, Requirements for Radiation Protection of the Public and the Environment, and operational and control requirements.	TBC	√			See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
Supplemental Limits and Exceptions for Residual Radioactive Material DOE Order 5400.5 Chapter IV (7)	If special specific property circumstances indicate that the concentration guidelines or authorized limits are not appropriate, supplemental limits or an exception may be requested to those guidelines or limits.	TBC	√			See preceding.
Release of Property DOE Order 5400.5 Chapter II (5)	Real property (land and structures), personal property, materials, and equipment shall be released if the concentration of radioactivity is within the limits of residual radioactive contamination.	TBC	√			See preceding.
POST-CLOSURE NOTICE/SURVEY PLAT						
Closure and Post-Closure Under Interim Standards, Survey Plat OAC 3745-66-16	The owner shall submit – to the local zoning authority, or the authority with jurisdiction over local land use, and to the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] – a survey plat, prepared and certified by a professional land surveyor, indicating the location and dimensions of landfill cells or other hazardous waste disposal units with respect to permanently surveyed benchmarks. The plat must contain a note, prominently displayed, which states the owner's obligation to restrict disturbance of the hazardous waste disposal unit in accordance with OAC 3745-66-17(C).	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1.	Currently addressed in the OSDF Post-closure Care and Inspection Plan, which notes in its Prologue that it can be revised at a later date to expand the scope of coverage to encompass the entire FEMP site as needed.
Closure and Post-Closure Under Interim Standards, Post-closure Notices OAC 3745-66-19(A)	The owner shall submit – to the local zoning authority, or the authority with jurisdiction over local land use, and to the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] – a record of the type, location, and quantity of hazardous waste disposed of within each cell or disposal unit of the facility.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1.	See preceding.

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TABLE A-2 (Continued)
PERTINENT ARARs AND TBCs

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
	DEED NOTATION					
Closure and Post-Closure Under Interim Standards, Post-closure Notices OAC 3745-66-19(B)	The owner shall record, in accordance with state law, a notation on the deed of the facility property, or on some other instrument which is normally examined during title search, that will notify in perpetuity the potential purchasers of the property that: • the land has been used to manage hazardous wastes; • its use is restricted under the Ohio Administrative Code closure and post-closure rules; and • a survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or hazardous waste unit of the facility as required by OAC 3745-66-16 and OAC 3745-66-19(A) have been filed with the local zoning authority or th. the Ohio Director of Environmental Protection].	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1.	Currently addressed in the OSDF Post-closure Care and Inspection Plan, which notes in its Prologue that it can be revised at a later date to expand the scope of coverage to encompass the entire FEMP site as needed. Will also be addressed in the NRRP.
Closure and Post-Closure Under Interim Standards, Post-closure Notices OAC 3745-66-19©	If the owner or any subsequent owner of the land upon which a hazardous waste disposal unit was located wishes to remove hazardous wastes and hazardous waste residues in satisfaction of the criteria in OAC 3745-66-17(C), the owner may request that the Director [of the OEPA, a.k.a. the Ohio Director of Environmental Protection] approve either: • the removal of the notation on the deed to the facility property or other instrument normally examined during title search; or • the addition of a notation to the deed or instrument indicating the removal of the hazardous waste.	√	√	√	Cited in the RCRA/CERCLA Integrated Closure DF&O @ V.1.	See preceding.

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APPENDIX B

SURFACE WATER CALCULATIONS

RUNOFF CURVE NUMBER COMPUTATION — Version 2.10

Project : Fire Training Facility — User: WJO — Date: 06-06-2002
County : Hamilton — State: Oh — Checked: ____ — Date: _____
Subtitle:
Subarea : Main

COVER DESCRIPTION		Hydrologic Soil Group A	B	C	D
			Acres (CN)		
FULLY DEVELOPED URBAN AREAS (Veg Estab.)					
Open space (Lawns,parks etc.)					
Fair condition; grass cover 50% to 75%		-	14.8(69)	-	-
OTHER AGRICULTURAL LANDS					
Woods - grass combination	fair	-	-	48.5(76)	-
Total Area (by Hydrologic Soil Group)			14.8	48.5	
			====	====	

SUBAREA: Main TOTAL DRAINAGE AREA: 63.3 Acres WEIGHTED CURVE NUMBER: 74*

* - Generated for use by GRAPHIC method

TIME OF CONCENTRATION AND TRAVEL TIME — Version 2.10

Project : Fire Training Facility — User: WJO — Date: 06-06-2002
County : Hamilton — State: Oh — Checked: ____ — Date: _____
Subtitle:

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.0	300	0.067	F					0.365
Shallow Concent'd		947	0.143	u					0.043
Shallow Concent'd		1368	0.007	u					0.282
								Time of Concentration =	0.69*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated Surface Codes ---

P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD

Version 2.10

Project : Fire Training Facility User: WJO Date: 06-06-2002
County : Hamilton State: Oh Checked: ____ Date: _____
Subtitle:

Data: Drainage Area : 63.3 * Acres
Runoff Curve Number : 74 *
Time of Concentration: 0.69 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1
Frequency (yrs)	10
24-Hr Rainfall (in)	4.1
Ia/P Ratio	0.17
Runoff (in)	1.67
Unit Peak Discharge (cfs/acre/in)	0.651
Pond and Swamp Factor 0.0% Ponds Used	1.00
Peak Discharge (cfs)	69

* - Value(s) provided from TR-55 system routines

Fire Training Facility
Culvert Calculation

$$Q = 1.486/n \times A \times R^{2/3} \times S^{1/2}$$

Discharge =	Q	
roughness coefficient =	n	0.009 (Driscopipe Manual)
flow area =	A	
wetted perimeter =	P	
hydraulic radius =	R	(= A/P)
pipe slope =	s	

Use SDR = 26 (Calculation based on Driscopipe Series 4200)

Pipe OD (In Inches) =	26.0	24.0	22.0	20.0	18.0
Pipe ID (In Feet) =	2.0	1.846	1.692	1.800	1.400
A =	3.142	2.677	2.249	2.545	1.539
P =	6.2830	5.7997	5.3165	5.6547	4.3981
R =	0.5	0.461542	0.423083	0.45	0.35
n =	0.009	0.009	0.009	0.009	0.009
s=	0.01	0.01	0.01	0.01	0.011

Q (cfs) =	32.676	26.396	20.930	24.672	13.239

Capacity of 26 inch diameter HDPE pipe = 32.7 cfs

Due to cover constraints, a 26" diam. HDPE pipe is the usable largest size.

Q required = 69 cfs

(2) 26" diam. Pipes provide 65.4 cfs

Note: The Hydrologic Soils Group for the entire Hillside was taken as Type C for the purpose of the calculation, although some of the soils are Type B. As a result the 69 cfs value is conservative and the capacity of (2) 26 inch pipes is deemed sufficient for a ten year storm event.

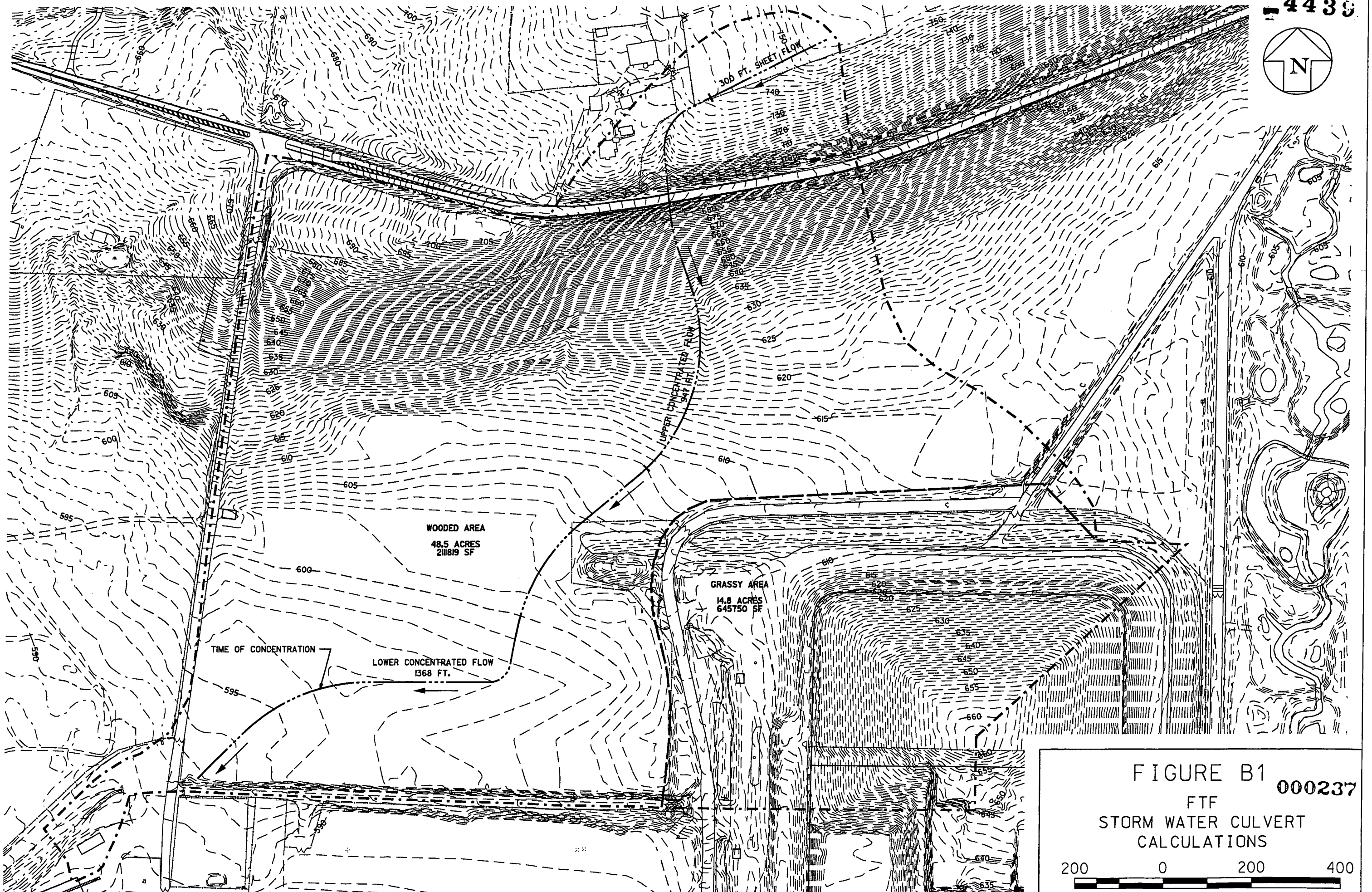

FIGURE B1

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FTF
STORM WATER CULVERT
CALCULATIONS

APPENDIX C

SOLID WASTE LANDFILL PREDESIGN CHARACTERIZATION DATA

APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-SWL-1	A6-SWL-1-48-D	20020623	23	24	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482243.78	1348213.29
	A6-SWL-1-48-D	20020623	23	24	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Aroclor-1254	37	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Aroclor-1260	1.4	NV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Arsenic	3.99	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Benzo(a)pyrene	370	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Benzo(b)fluoranthene	2300	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Beryllium	.396	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Dieldrin	3.7	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Fluoride	3.59	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-48-E	20020623	23	24	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-L	20020623	23	24	1,1-Dichloroethene	44	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-L	20020623	23	24	Bromodichloromethane	430	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-L	20020623	23	24	Tetrachloroethene	380	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Cesium-137	.0259	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Radium-226	TBD	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Technetium-99	2.08	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Thorium-228	.664	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Thorium-230	9.44	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Thorium-232	.661	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-48-R	20020623	23	24	Uranium, Total	4.02	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-52-D	20020623	25	26	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482243.78	1348213.29
	A6-SWL-1-52-D	20020623	25	26	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Aroclor-1254	.038	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Aroclor-1260	.038	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Arsenic	5.26	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Benzo(a)pyrene	380	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Benzo(b)fluoranthene	2300	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Beryllium	.599	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Dieldrin	3.8	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Fluoride	4.6	NV	mg/kg	482243.78	1348213.29
	A6-SWL-1-52-E	20020623	25	26	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-L	20020623	25	26	1,1-Dichloroethene	44	UNV	ug/kg	482243.78	1348213.29

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-1-52-L	20020623	25	26	Bromodichloromethane	430	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-L	20020623	25	26	Tetrachloroethene	390	UNV	ug/kg	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Cesium-137	.0422	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Radium-226	TBD	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Technetium-99	2.34	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Thorium-228	.82	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Thorium-230	6	UNV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Thorium-232	.797	NV	pCi/g	482243.78	1348213.29
	A6-SWL-1-52-R	20020623	25	26	Uranium, Total	3.26	NV	mg/kg	482243.78	1348213.29
A6-SWL-2	A6-SWL-2-48-D	20020623	23	24	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482230.85	1348240.88
	A6-SWL-2-48-D	20020623	23	24	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Aroclor-1254	37	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Aroclor-1260	37	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Arsenic	4.69	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Benzo(a)pyrene	380	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Benzo(b)fluoranthene	2300	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Beryllium	.48	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Dieldrin	3.7	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Fluoride	3.93	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-48-E	20020623	23	24	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-L	20020623	23	24	1,1-Dichloroethene	44	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-L	20020623	23	24	Bromodichloromethane	430	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-L	20020623	23	24	Tetrachloroethene	390	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Cesium-137	.0195	UNV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Radium-226	TBD	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Technetium-99	1.99	UNV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Thorium-228	.725	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Thorium-230	5.04	UNV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Thorium-232	.705	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-48-R	20020623	23	24	Uranium, Total	3	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-52-D	20020623	25	26	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482230.85	1348240.88
	A6-SWL-2-52-D	20020623	25	26	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Aroclor-1254	40	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Aroclor-1260	40	UNV	ug/kg	482230.85	1348240.88

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-2-52-E	20020623	25	26	Arsenic	6.01	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Benzo(a)pyrene	400	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Benzo(b)fluoranthene	2400	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Beryllium	.595	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Dibenzo(a,h)anthracene	240	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Dieldrin	4	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Fluoride	4.78	NV	mg/kg	482230.85	1348240.88
	A6-SWL-2-52-E	20020623	25	26	Indeno(1,2,3-cd)pyrene	2400	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-L	20020623	25	26	1,1-Dichloroethene	46	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-L	20020623	25	26	Bromodichloromethane	440	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-L	20020623	25	26	Tetrachloroethene	400	UNV	ug/kg	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Cesium-137	.0515	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Radium-226	TBD	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Technetium-99	5.6	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Thorium-228	.776	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Thorium-230	8.75	UNV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Thorium-232	.748	NV	pCi/g	482230.85	1348240.88
	A6-SWL-2-52-R	20020623	25	26	Uranium, Total	4.19	NV	mg/kg	482230.85	1348240.88
A6-SWL-3	A6-SWL-3-30-D	20020701	14	15	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-30-D	20020701	14	15	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Aroclor-1254	42	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Aroclor-1260	42	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Arsenic	12.5	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Benzo(a)pyrene	420	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Benzo(b)fluoranthene	2500	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Beryllium	1.54	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Dibenzo(a,h)anthracene	250	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Dieldrin	4.2	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Fluoride	4.02	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-30-E	20020701	14	15	Indeno(1,2,3-cd)pyrene	2500	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-L	20020701	14	15	1,1-Dichloroethene	51	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-L	20020701	14	15	Bromodichloromethane	490	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-L	20020701	14	15	Tetrachloroethene	440	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Cesium-137	.038	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Radium-226	TBD	NV	pCi/g	482166.32	1348346.39

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-3-30-R	20020701	14	15	Technetium-99	2	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Thorium-228	1.24	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Thorium-230	10.7	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Thorium-232	1.24	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-30-R	20020701	14	15	Uranium, Total	4.78	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-32-D	20020701	15	16	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-32-D	20020701	15	16	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Aroclor-1254	37	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Aroclor-1260	37	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Arsenic	6.27	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Benzo(a)pyrene	370	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Benzo(b)fluoranthene	2300	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Beryllium	.935	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Dieldrin	3.7	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Fluoride	3.09	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-32-E	20020701	15	16	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-L	20020701	15	16	1,1-Dichloroethene	47	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-L	20020701	15	16	Bromodichloromethane	460	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-L	20020701	15	16	Tetrachloroethene	410	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Cesium-137	.0271	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Radium-226	TBD	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Technetium-99	2.31	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Thorium-228	.795	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Thorium-230	10.2	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Thorium-232	.76	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-32-R	20020701	15	16	Uranium, Total	3.42	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-36-D	20020701	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-36-D	20020701	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Aroclor-1254	37	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Aroclor-1260	37	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Arsenic	5.59	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Benzo(a)pyrene	370	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Benzo(b)fluoranthene	2200	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Beryllium	.738	NV	mg/kg	482166.32	1348346.39

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-3-36-E	20020701	17	18	Dibenzo(a,h)anthracene	220	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Dieldrin	3.7	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Fluoride	4.71	NV	mg/kg	482166.32	1348346.39
	A6-SWL-3-36-E	20020701	17	18	Indeno(1,2,3-cd)pyrene	2200	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-L	20020701	17	18	1,1-Dichloroethene	46	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-L	20020701	17	18	Bromodichloromethane	440	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-L	20020701	17	18	Tetrachloroethene	400	UNV	ug/kg	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Cesium-137	.0371	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Radium-226	TBD	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Technetium-99	2.18	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Thorium-228	.66	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Thorium-230	4.82	UNV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Thorium-232	.677	NV	pCi/g	482166.32	1348346.39
	A6-SWL-3-36-R	20020701	17	18	Uranium, Total	3.87	NV	mg/kg	482166.32	1348346.39
A6-SWL-4	A6-SWL-4-32-D	20020620	15	16	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482176.17	1348303.40
	A6-SWL-4-32-D	20020620	15	16	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Cesium-137	.035	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Radium-226	TBD	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Technetium-99	1.91	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Thorium-228	1.01	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Thorium-230	8.91	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Thorium-232	1.02	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-32-R	20020620	15	16	Uranium, Total	5.54	NV	mg/kg	482176.17	1348303.40
	A6-SWL-4-36-D	20020620	15	16	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482176.17	1348303.40
	A6-SWL-4-36-D	20020620	15	16	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Cesium-137	.0265	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Radium-226	TBD	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Technetium-99	2.15	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Thorium-228	.76	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Thorium-230	8.18	UNV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Thorium-232	.766	NV	pCi/g	482176.17	1348303.40
	A6-SWL-4-36-R	20020620	15	16	Uranium, Total	5.24	NV	mg/kg	482176.17	1348303.40
A6-SWL-5	A6-SWL-5-10B-R	20020720	4	5	Moisture Content	14.3	NV	PERCENT	482144.71	1348270.27
	A6-SWL-5-10B-R	20020720	4	5	Uranium, Total	36950	NV	mg/kg dry	482144.71	1348270.27
	A6-SWL-5-12B-R	20020720	5	6	Moisture Content	12.3	NV	PERCENT	482144.71	1348270.27

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-5-12B-R	20020720	5	6	Uranium, Total	293	NV	mg/kg dry	482144.71	1348270.27
	A6-SWL-5-32-D	20020620	15	16	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482144.71	1348270.27
	A6-SWL-5-32-D	20020620	15	16	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Cesium-137	.0202	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Radium-226	TBD	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Technetium-99	1.57	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Thorium-228	.907	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Thorium-230	5.38	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Thorium-232	.89	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-32-R	20020620	15	16	Uranium, Total	4.59	NV	mg/kg	482144.71	1348270.27
	A6-SWL-5-36-D	20020620	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482144.71	1348270.27
	A6-SWL-5-36-D	20020620	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Cesium-137	.0365	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Radium-226	TBD	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Technetium-99	1.77	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Thorium-228	.878	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Thorium-230	4.59	UNV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Thorium-232	.847	NV	pCi/g	482144.71	1348270.27
	A6-SWL-5-36-R	20020620	17	18	Uranium, Total	5.05	NV	mg/kg	482144.71	1348270.27
	A6-SWL-5-6B-R	20020620	2	3	Moisture Content	11.4	NV	PERCENT	482144.71	1348270.27
	A6-SWL-5-6B-R	20020620	2	3	Uranium, Total	192	NV	mg/kg dry	482144.71	1348270.27
	A6-SWL-5-8B-R	20020720	3	4	Moisture Content	12.3	NV	PERCENT	482144.71	1348270.27
	A6-SWL-5-8B-R	20020720	3	4	Uranium, Total	8719	NV	mg/kg dry	482144.71	1348270.27
A6-SWL-6	A6-SWL-6-2-R	20020624	0	1	Moisture Content	10.9	NV	PERCENT	482256.75	1348249.02
	A6-SWL-6-2-R	20020624	0	1	Technetium-99	2	UNV	pCi/g	482256.75	1348249.02
	A6-SWL-6-2-R	20020624	0	1	Uranium, Total	36.7	NV	mg/kg dry	482256.75	1348249.02
	A6-SWL-6-26-R	20020624	12	13	Moisture Content	17.6	NV	PERCENT	482256.75	1348249.02
	A6-SWL-6-26-R	20020624	12	13	Technetium-99	1.7	UNV	pCi/g	482256.75	1348249.02
	A6-SWL-6-26-R	20020624	12	13	Uranium, Total	1.19	NV	mg/kg dry	482256.75	1348249.02
	A6-SWL-6-40-D	20020624	19	20	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482256.75	1348249.02
	A6-SWL-6-40-D	20020624	19	20	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Cesium-137	.0347	UNV	pCi/g	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Radium-226	TBD	NV	pCi/g	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Technetium-99	1.89	UNV	pCi/g	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Thorium-228	.704	NV	pCi/g	482256.75	1348249.02

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-6-40-R	20020624	19	20	Thorium-230	4.66	UNV	pCi/g	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Thorium-232	.703	NV	pCi/g	482256.75	1348249.02
	A6-SWL-6-40-R	20020624	19	20	Uranium, Total	3.26	NV	mg/kg	482256.75	1348249.02

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-SWL-7	A6-SWL-7-12-R	20020625	5	6	Moisture Content	16.8	NV	PERCENT	482239.19	1348112.85
	A6-SWL-7-12-R	20020625	5	6	Technetium-99	1.9	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-12-R	20020625	5	6	Uranium, Total	17.7	NV	mg/kg dry	482239.19	1348112.85
	A6-SWL-7-2-R	20020625	0	1	Moisture Content	7.3	NV	PERCENT	482239.19	1348112.85
	A6-SWL-7-2-R	20020625	0	1	Technetium-99	1.9	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-2-R	20020625	0	1	Uranium, Total	22.3	NV	mg/kg dry	482239.19	1348112.85
	A6-SWL-7-26-R	20020625	12	13	Moisture Content	13.2	NV	PERCENT	482239.19	1348112.85
	A6-SWL-7-26-R	20020625	12	13	Technetium-99	1.9	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-26-R	20020625	12	13	Uranium, Total	1.14	NV	mg/kg dry	482239.19	1348112.85
	A6-SWL-7-28-D	20020625	13	14	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482239.19	1348112.85
	A6-SWL-7-28-D	20020625	13	14	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Aroclor-1254	37	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Aroclor-1260	37	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Arsenic	5.26	NV	mg/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Benzo(a)pyrene	370	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Benzo(b)fluoranthene	2300	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Beryllium	.364	NV	mg/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Dieldrin	3.7	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Fluoride	4.21	NV	mg/kg	482239.19	1348112.85
	A6-SWL-7-28-E	20020625	13	14	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-L	20020625	13	14	1,1-Dichloroethene	45	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-L	20020625	13	14	Bromodichloromethane	440	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-L	20020625	13	14	Tetrachloroethene	390	UNV	ug/kg	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Cesium-137	.0247	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Radium-226	TBD	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Technetium-99	2.17	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Thorium-228	.692	NV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Thorium-230	8.92	UNV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Thorium-232	.696	NV	pCi/g	482239.19	1348112.85
	A6-SWL-7-28-R	20020625	13	14	Uranium, Total	3.71	NV	mg/kg	482239.19	1348112.85
A6-SWL-8	A6-SWL-8-12-R	20020625	5	6	Moisture Content	12.6	NV	PERCENT	482225.24	1348129.27
	A6-SWL-8-12-R	20020625	5	6	Technetium-99	2	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-12-R	20020625	5	6	Uranium, Total	62.2	NV	mg/kg dry	482225.24	1348129.27
	A6-SWL-8-2-R	20020625	0	1	Moisture Content	9.7	NV	PERCENT	482225.24	1348129.27

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Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-8-2-R	20020625	0	1	Technetium-99	1.9	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-2-R	20020625	0	1	Uranium, Total	26.4	NV	mg/kg dry	482225.24	1348129.27
	A6-SWL-8-32-R	20020625	15	16	Moisture Content	10.5	NV	PERCENT	482225.24	1348129.27
	A6-SWL-8-32-R	20020625	15	16	Technetium-99	2	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-32-R	20020625	15	16	Uranium, Total	1.1	NV	mg/kg dry	482225.24	1348129.27
	A6-SWL-8-34-D	20020625	16	17	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482225.24	1348129.27
	A6-SWL-8-34-D	20020625	16	17	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Aroclor-1254	37	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Aroclor-1260	37	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Arsenic	5.02	NV	mg/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Benzo(a)pyrene	370	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Benzo(b)fluoranthene	2200	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Beryllium	.286	NV	mg/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Dibenzo(a,h)anthracene	220	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Dieldrin	3.7	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Fluoride	4.21	NV	mg/kg	482225.24	1348129.27
	A6-SWL-8-34-E	20020625	16	17	Indeno(1,2,3-cd)pyrene	2200	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-L	20020625	16	17	1,1-Dichloroethene	44	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-L	20020625	16	17	Bromodichloromethane	420	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-L	20020625	16	17	Tetrachloroethene	380	UNV	ug/kg	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Cesium-137	.028	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Radium-226	TBD	NV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Technetium-99	2.12	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Thorium-228	.556	NV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Thorium-230	8.22	UNV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Thorium-232	.551	NV	pCi/g	482225.24	1348129.27
	A6-SWL-8-34-R	20020625	16	17	Uranium, Total	3.67	NV	mg/kg	482225.24	1348129.27
A6-SWL-9	A6-SWL-9-10B-R	20020724	4	5	Moisture Content	17.2	NV	PERCENT	482226.96	1348181.38
	A6-SWL-9-10B-R	20020724	4	5	Uranium, Total	240	NV	mg/kg dry	482226.96	1348181.38
	A6-SWL-9-2-R	20020624	0	1	Moisture Content	15.5	NV	PERCENT	482226.96	1348181.38
	A6-SWL-9-2-R	20020624	0	1	Technetium-99	1.8	UNV	pCi/g	482226.96	1348181.38
	A6-SWL-9-2-R	20020624	0	1	Uranium, Total	21.4	NV	mg/kg dry	482226.96	1348181.38
	A6-SWL-9-26-R	20020624	12	13	Moisture Content	13	NV	PERCENT	482226.96	1348181.38
	A6-SWL-9-26-R	20020624	12	13	Technetium-99	1.9	UNV	pCi/g	482226.96	1348181.38
	A6-SWL-9-26-R	20020624	12	13	Uranium, Total	1.15	NV	mg/kg dry	482226.96	1348181.38

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-9-36-D	20020624	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482226.96	1348181.38
	A6-SWL-9-36-D	20020624	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Cesium-137	.0267	UNV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Radium-226	TBD	NV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Technetium-99	1.88	UNV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Thorium-228	.614	NV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Thorium-230	3.3	UNV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Thorium-232	.604	NV	pCi/g	482226.96	1348181.38
	A6-SWL-9-36-R	20020624	17	18	Uranium, Total	3.15	NV	mg/kg	482226.96	1348181.38
	A6-SWL-9-6B-R	20020724	2	3	Moisture Content	30	NV	PERCENT	482226.96	1348181.38
	A6-SWL-9-6B-R	20020724	2	3	Uranium, Total	118	NV	mg/kg dry	482226.96	1348181.38
	A6-SWL-9-8B-R	20020724	2	3	Moisture Content	17.2	NV	PERCENT	482226.96	1348181.38
	A6-SWL-9-8B-R	20020724	2	3	Uranium, Total	335	NV	mg/kg dry	482226.96	1348181.38
A6-SWL-10	A6-SWL-10-12-R	20020625	5	6	Moisture Content	16.7	NV	PERCENT	482158.10	1348117.09
	A6-SWL-10-12-R	20020625	5	6	Technetium-99	1.8	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-12-R	20020625	5	6	Uranium, Total	21.1	NV	mg/kg dry	482158.10	1348117.09
	A6-SWL-10-2-R	20020625	0	1	Moisture Content	15.1	NV	PERCENT	482158.10	1348117.09
	A6-SWL-10-2-R	20020625	0	1	Technetium-99	1.8	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-2-R	20020625	0	1	Uranium, Total	64.5	NV	mg/kg dry	482158.10	1348117.09
	A6-SWL-10-22-R	20020625	10	11	Moisture Content	13.7	NV	PERCENT	482158.10	1348117.09
	A6-SWL-10-22-R	20020625	10	11	Technetium-99	1.8	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-22-R	20020625	10	11	Uranium, Total	1.24	NV	mg/kg dry	482158.10	1348117.09
	A6-SWL-10-26-D	20020625	12	13	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482158.10	1348117.09
	A6-SWL-10-26-D	20020625	12	13	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Aroclor-1254	38	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Aroclor-1260	38	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Arsenic	3.65	NV	mg/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Benzo(a)pyrene	380	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Benzo(b)fluoranthene	2300	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Beryllium	.676	NV	mg/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Dieldrin	3.8	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Fluoride	4.08	NV	mg/kg	482158.10	1348117.09
	A6-SWL-10-26-E	20020625	12	13	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-L	20020625	12	13	1,1-Dichloroethene	44	UNV	ug/kg	482158.10	1348117.09

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-10-26-L	20020625	12	13	Bromodichloromethane	430	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-L	20020625	12	13	Tetrachloroethene	390	UNV	ug/kg	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Cesium-137	.0337	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Radium-226	TBD	NV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Technetium-99	1.95	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Thorium-228	.902	NV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Thorium-230	8.79	UNV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Thorium-232	.885	NV	pCi/g	482158.10	1348117.09
	A6-SWL-10-26-R	20020625	12	13	Uranium, Total	3.76	NV	mg/kg	482158.10	1348117.09
A6-SWL-11	A6-SWL-11-2-R	20020626	0	1	Moisture Content	10.7	NV	PERCENT	482192.05	1348162.36
	A6-SWL-11-2-R	20020626	0	1	Technetium-99	1.8	UNV	pCi/g	482192.05	1348162.36
	A6-SWL-11-2-R	20020626	0	1	Uranium, Total	55.4	NV	mg/kg dry	482192.05	1348162.36
	A6-SWL-11-26-R	20020626	12	13	Moisture Content	12.4	NV	PERCENT	482192.05	1348162.36
	A6-SWL-11-26-R	20020626	12	13	Technetium-99	2	UNV	pCi/g	482192.05	1348162.36
	A6-SWL-11-26-R	20020626	12	13	Uranium, Total	6.87	NV	mg/kg dry	482192.05	1348162.36
	A6-SWL-11-36-D	20020626	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482192.05	1348162.36
	A6-SWL-11-36-D	20020626	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Aroclor-1254	38	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Aroclor-1260	38	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Arsenic	6.35	NV	mg/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Benzo(a)pyrene	3500	NV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Benzo(b)fluoranthene	5900	NV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Beryllium	.928	NV	mg/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Dibenzo(a,h)anthracene	920	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Dieldrin	4.6	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Fluoride	5.17	NV	mg/kg	482192.05	1348162.36
	A6-SWL-11-36-E	20020626	17	18	Indeno(1,2,3-cd)pyrene	1800	NV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-L	20020626	17	18	1,1-Dichloroethene	48	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-L	20020626	17	18	Bromodichloromethane	470	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-L	20020626	17	18	Tetrachloroethene	420	UNV	ug/kg	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Cesium-137	.0837	UNV	pCi/g	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Radium-226	TBD	UNV	pCi/g	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Technetium-99	1.12	UNV	pCi/g	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Thorium-228	.677	NV	pCi/g	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Thorium-230	14.7	UNV	pCi/g	482192.05	1348162.36

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-11-36-R	20020626	17	18	Thorium-232	.672	NV	pCi/g	482192.05	1348162.36
	A6-SWL-11-36-R	20020626	17	18	Uranium, Total	3.89	NV	mg/kg	482192.05	1348162.36
A6-SWL-12	A6-SWL-12-12-R	20020626	5	6	Moisture Content	15.2	NV	PERCENT	482157.46	1348162.31
	A6-SWL-12-12-R	20020626	5	6	Technetium-99	7	NV	pCi/g	482157.46	1348162.31
	A6-SWL-12-12-R	20020626	5	6	Uranium, Total	106	NV	mg/kg dry	482157.46	1348162.31
	A6-SWL-12-2-R	20020626	0	1	Moisture Content	11	NV	PERCENT	482157.46	1348162.31
	A6-SWL-12-2-R	20020626	0	1	Technetium-99	1.7	UNV	pCi/g	482157.46	1348162.31
	A6-SWL-12-2-R	20020626	0	1	Uranium, Total	42.3	NV	mg/kg dry	482157.46	1348162.31
	A6-SWL-12-26-R	20020626	12	13	Moisture Content	17.9	NV	PERCENT	482157.46	1348162.31
	A6-SWL-12-26-R	20020626	12	13	Technetium-99	1.9	UNV	pCi/g	482157.46	1348162.31
	A6-SWL-12-26-R	20020626	12	13	Uranium, Total	2.73	NV	mg/kg dry	482157.46	1348162.31
	A6-SWL-12-34-D	20020626	16	17	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482157.46	1348162.31
	A6-SWL-12-34-D	20020626	16	17	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Aroclor-1254	37	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Aroclor-1260	37	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Arsenic	5.28	NV	mg/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Benzo(a)pyrene	370	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Benzo(b)fluoranthene	2300	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Beryllium	.661	NV	mg/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Dieldrin	3.7	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Fluoride	4.43	NV	mg/kg	482157.46	1348162.31
	A6-SWL-12-34-E	20020626	16	17	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-L	20020626	16	17	1,1-Dichloroethene	46	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-L	20020626	16	17	Bromodichloromethane	450	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-L	20020626	16	17	Tetrachloroethene	410	UNV	ug/kg	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Cesium-137	.0312	UNV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Radium-226	TBD	NV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Technetium-99	1.09	UNV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Thorium-228	.725	NV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Thorium-230	12	UNV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Thorium-232	.724	NV	pCi/g	482157.46	1348162.31
	A6-SWL-12-34-R	20020626	16	17	Uranium, Total	2.52	NV	mg/kg	482157.46	1348162.31
A6-SWL-13	A6-SWL-13-12-R	20020626	5	6	Moisture Content	11.7	NV	PERCENT	482180.68	1348222.36
	A6-SWL-13-12-R	20020626	5	6	Technetium-99	1.7	UNV	pCi/g	482180.68	1348222.36

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Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-13-12-R	20020626	5	6	Uranium, Total	116	NV	mg/kg dry	482180.68	1348222.36
	A6-SWL-13-2-R	20020626	0	1	Moisture Content	10.5	NV	PERCENT	482180.68	1348222.36
	A6-SWL-13-2-R	20020626	0	1	Technetium-99	1.5	UNV	pCi/g	482180.68	1348222.36
	A6-SWL-13-2-R	20020626	0	1	Uranium, Total	76.7	NV	mg/kg dry	482180.68	1348222.36
	A6-SWL-13-26-R	20020626	12	13	Moisture Content	19.7	NV	PERCENT	482180.68	1348222.36
	A6-SWL-13-26-R	20020626	12	13	Technetium-99	1.8	UNV	pCi/g	482180.68	1348222.36
	A6-SWL-13-26-R	20020626	12	13	Uranium, Total	5.4	NV	mg/kg dry	482180.68	1348222.36
	A6-SWL-13-36-D	20020626	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482180.68	1348222.36
	A6-SWL-13-36-D	20020626	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Aroclor-1254	42	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Aroclor-1260	42	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Arsenic	7.09	NV	mg/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Benzo(a)pyrene	420	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Benzo(b)fluoranthene	2500	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Beryllium	1.16	NV	mg/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Dibenzo(a,h)anthracene	250	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Dieldrin	4.2	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Fluoride	4.79	NV	mg/kg	482180.68	1348222.36
	A6-SWL-13-36-E	20020626	17	18	Indeno(1,2,3-cd)pyrene	2500	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-L	20020626	17	18	1,1-Dichloroethene	50	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-L	20020626	17	18	Bromodichloromethane	490	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-L	20020626	17	18	Tetrachloroethene	440	UNV	ug/kg	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Cesium-137	.0586	UNV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Radium-226	TBD	NV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Technetium-99	1.3	UNV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Thorium-228	.848	NV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Thorium-230	17.9	UNV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Thorium-232	.843	NV	pCi/g	482180.68	1348222.36
	A6-SWL-13-36-R	20020626	17	18	Uranium, Total	2.73	UNV	mg/kg	482180.68	1348222.36
A6-SWL-14	A6-SWL-14-2-R	20020623	0	1	Moisture Content	17.4	NV	PERCENT	482202.13	1348273.92
	A6-SWL-14-2-R	20020623	0	1	Technetium-99	1.9	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-2-R	20020623	0	1	Uranium, Total	95.6	NV	mg/kg dry	482202.13	1348273.92
	A6-SWL-14-24-R	20020623	11	12	Moisture Content	20.7	NV	PERCENT	482202.13	1348273.92
	A6-SWL-14-24-R	20020623	11	12	Technetium-99	2.1	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-24-R	20020623	11	12	Uranium, Total	1.24	NV	mg/kg dry	482202.13	1348273.92

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-14-32-R	20020623	15	16	Moisture Content	18.2	NV	PERCENT	482202.13	1348273.92
	A6-SWL-14-32-R	20020623	15	16	Technetium-99	1.4	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-32-R	20020623	15	16	Uranium, Total	1.43	NV	mg/kg dry	482202.13	1348273.92
	A6-SWL-14-48-D	20020623	23	24	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482202.13	1348273.92
	A6-SWL-14-48-D	20020623	23	24	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Aroclor-1254	38	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Aroclor-1260	38	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Arsenic	5.7	NV	mg/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Benzo(a)pyrene	380	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Benzo(b)fluoranthene	2300	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Beryllium	.561	NV	mg/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Dieldrin	3.8	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Fluoride	4.02	NV	mg/kg	482202.13	1348273.92
	A6-SWL-14-48-E	20020623	23	24	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-L	20020623	23	24	1,1-Dichloroethene	45	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-L	20020623	23	24	Bromodichloromethane	440	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-L	20020623	23	24	Tetrachloroethene	390	UNV	ug/kg	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Cesium-137	.021	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Radium-226	TBD	NV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Technetium-99	2.27	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Thorium-228	.792	NV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Thorium-230	8.77	UNV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Thorium-232	.642	NV	pCi/g	482202.13	1348273.92
	A6-SWL-14-48-R	20020623	23	24	Uranium, Total	3.69	NV	mg/kg	482202.13	1348273.92
A6-SWL-15	A6-SWL-15-12-R	20020625	5	6	Moisture Content	12.3	NV	PERCENT	482265.33	1348155.17
	A6-SWL-15-12-R	20020625	5	6	Technetium-99	1.9	UNV	pCi/g	482265.33	1348155.17
	A6-SWL-15-12-R	20020625	5	6	Uranium, Total	10.3	NV	mg/kg dry	482265.33	1348155.17
	A6-SWL-15-2-R	20020625	0	1	Moisture Content	16.3	NV	PERCENT	482265.33	1348155.17
	A6-SWL-15-2-R	20020625	0	1	Technetium-99	1.7	UNV	pCi/g	482265.33	1348155.17
	A6-SWL-15-2-R	20020625	0	1	Uranium, Total	44.6	NV	mg/kg dry	482265.33	1348155.17
	A6-SWL-15-20-D	20020625	9	10	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482265.33	1348155.17
	A6-SWL-15-20-D	20020625	9	10	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Aroclor-1254	37	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Aroclor-1260	37	UNV	ug/kg	482265.33	1348155.17

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Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-15-20-E	20020625	9	10	Arsenic	4.83	NV	mg/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Benzo(a)pyrene	370	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Benzo(b)fluoranthene	2200	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Beryllium	.318	NV	mg/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Dibenzo(a,h)anthracene	220	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Dieldrin	3.7	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Fluoride	3.95	NV	mg/kg	482265.33	1348155.17
	A6-SWL-15-20-E	20020625	9	10	Indeno(1,2,3-cd)pyrene	2200	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-L	20020625	9	10	1,1-Dichloroethene	43	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-L	20020625	9	10	Bromodichloromethane	420	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-L	20020625	9	10	Tetrachloroethene	380	UNV	ug/kg	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Cesium-137	.0259	UNV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Radium-226	TBD	NV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Technetium-99	2.14	UNV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Thorium-228	.665	NV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Thorium-230	7.54	UNV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Thorium-232	.582	NV	pCi/g	482265.33	1348155.17
	A6-SWL-15-20-R	20020625	9	10	Uranium, Total	2.24	NV	mg/kg	482265.33	1348155.17
A6-SWL-16	A6-SWL-16-2-R	20020626	0	1	Moisture Content	12.4	NV	PERCENT	482265.87	1348223.57
	A6-SWL-16-2-R	20020626	0	1	Technetium-99	1.8	UNV	pCi/g	482265.87	1348223.57
	A6-SWL-16-2-R	20020626	0	1	Uranium, Total	22.4	NV	mg/kg dry	482265.87	1348223.57
	A6-SWL-16-24-R	20020626	11	12	Moisture Content	13.3	NV	PERCENT	482265.87	1348223.57
	A6-SWL-16-24-R	20020626	11	12	Technetium-99	1.8	UNV	pCi/g	482265.87	1348223.57
	A6-SWL-16-24-R	20020626	11	12	Uranium, Total	11.2	NV	mg/kg dry	482265.87	1348223.57
	A6-SWL-16A-34-D	20020626	16	17	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482265.87	1348223.57
	A6-SWL-16A-34-D	20020626	16	17	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Aroclor-1254	36	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Aroclor-1260	36	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Arsenic	6.95	NV	mg/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Benzo(a)pyrene	360	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Benzo(b)fluoranthene	50	NV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Beryllium	.574	NV	mg/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Dibenzo(a,h)anthracene	220	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Dieldrin	3.6	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-E	20020626	16	17	Fluoride	4.89	NV	mg/kg	482265.87	1348223.57

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-16A-34-E	20020626	16	17	Indeno(1,2,3-cd)pyrene	2200	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-L	20020626	16	17	1,1-Dichloroethene	46	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-L	20020626	16	17	Bromodichloromethane	450	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-L	20020626	16	17	Tetrachloroethene	400	UNV	ug/kg	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Cesium-137	.0334	UNV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Radium-226	TBD	NV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Technetium-99	1.26	UNV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Thorium-228	.572	NV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Thorium-230	10.6	UNV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Thorium-232	.571	NV	pCi/g	482265.87	1348223.57
	A6-SWL-16A-34-R	20020626	16	17	Uranium, Total	3	NV	mg/kg	482265.87	1348223.57
A6-SWL-17	A6-SWL-17-2-R	20020627	0	1	Moisture Content	9.5	NV	PERCENT	482258.9	1348296.35
	A6-SWL-17-2-R	20020627	0	1	Technetium-99	1.8	UNV	pCi/g	482258.9	1348296.35
	A6-SWL-17-2-R	20020627	0	1	Uranium, Total	45.9	NV	mg/kg dry	482258.9	1348296.35
	A6-SWL-17-26-R	20020627	12	13	Moisture Content	16.3	NV	PERCENT	482258.9	1348296.35
	A6-SWL-17-26-R	20020627	12	13	Technetium-99	1.9	UNV	pCi/g	482258.9	1348296.35
	A6-SWL-17-26-R	20020627	12	13	Uranium, Total	3.47	NV	mg/kg dry	482258.9	1348296.35
	A6-SWL-17-50-D	20020627	24	25	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482258.9	1348296.35
	A6-SWL-17-50-D	20020627	24	25	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Aroclor-1254	37	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Aroclor-1260	37	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Arsenic	5.51	NV	mg/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Benzo(a)pyrene	370	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Benzo(b)fluoranthene	2300	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Beryllium	.533	NV	mg/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Dieldrin	3.7	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Fluoride	3.14	NV	mg/kg	482258.9	1348296.35
	A6-SWL-17-50-E	20020627	24	25	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-L	20020627	24	25	1,1-Dichloroethene	45	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-L	20020627	24	25	Bromodichloromethane	440	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-L	20020627	24	25	Tetrachloroethene	400	UNV	ug/kg	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Cesium-137	.0351	UNV	pCi/g	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Radium-226	TBD	NV	pCi/g	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Technetium-99	1.06	UNV	pCi/g	482258.9	1348296.35

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-17-50-R	20020627	24	25	Thorium-228	.518	NV	pCi/g	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Thorium-230	10.4	UNV	pCi/g	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Thorium-232	.516	NV	pCi/g	482258.9	1348296.35
	A6-SWL-17-50-R	20020627	24	25	Uranium, Total	2.97	NV	mg/kg	482258.9	1348296.35
A6-SWL-18	A6-SWL-18-2-R	20020627	0	1	Moisture Content	9.4	NV	PERCENT	482278.2	1348349.26
	A6-SWL-18-2-R	20020627	0	1	Technetium-99	1.7	UNV	pCi/g	482278.2	1348349.26
	A6-SWL-18-2-R	20020627	0	1	Uranium, Total	47.7	NV	mg/kg dry	482278.2	1348349.26
	A6-SWL-18-20-R	20020627	9	10	Moisture Content	12.8	NV	PERCENT	482278.2	1348349.26
	A6-SWL-18-20-R	20020627	9	10	Technetium-99	1.8	UNV	pCi/g	482278.2	1348349.26
	A6-SWL-18-20-R	20020627	9	10	Uranium, Total	8.2	NV	mg/kg dry	482278.2	1348349.26
	A6-SWL-18-36-D	20020627	17	18	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482278.2	1348349.26
	A6-SWL-18-36-D	20020627	17	18	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Aroclor-1254	38	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Aroclor-1260	38	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Arsenic	9.14	NV	mg/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Benzo(a)pyrene	380	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Benzo(b)fluoranthene	2300	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Beryllium	.757	NV	mg/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Dibenzo(a,h)anthracene	230	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Dieldrin	3.8	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Fluoride	4.63	NV	mg/kg	482278.2	1348349.26
	A6-SWL-18-36-E	20020627	17	18	Indeno(1,2,3-cd)pyrene	2300	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-L	20020627	17	18	1,1-Dichloroethene	46	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-L	20020627	17	18	Bromodichloromethane	450	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-L	20020627	17	18	Tetrachloroethene	400	UNV	ug/kg	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Cesium-137	.0266	UNV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Radium-226	TBD	NV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Technetium-99	1.19	UNV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Thorium-228	.614	NV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Thorium-230	6.58	UNV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Thorium-232	.619	NV	pCi/g	482278.2	1348349.26
	A6-SWL-18-36-R	20020627	17	18	Uranium, Total	2.35	NV	mg/kg	482278.2	1348349.26
A6-SWL-19	A6-SWL-19-12-R	20020620	5	6	Moisture Content	19.7	NV	PERCENT	482274.01	1348323.58
	A6-SWL-19-12-R	20020620	5	6	Technetium-99	1.7	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-12-R	20020620	5	6	Uranium, Total	13.9	NV	mg/kg dry	482274.01	1348323.58

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APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-19-2-R	20020620	0	1	Moisture Content	11.5	NV	PERCENT	482274.01	1348323.58
	A6-SWL-19-2-R	20020620	0	1	Technetium-99	1.9	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-2-R	20020620	0	1	Uranium, Total	18.8	NV	mg/kg dry	482274.01	1348323.58
	A6-SWL-19-24-R	20020620	11	12	Moisture Content	13.7	NV	PERCENT	482274.01	1348323.58
	A6-SWL-19-24-R	20020620	11	12	Technetium-99	2.2	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-24-R	20020620	11	12	Uranium, Total	1.47	NV	mg/kg dry	482274.01	1348323.58
	A6-SWL-19-30-D	20020620	14	15	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482274.01	1348323.58
	A6-SWL-19-30-D	20020620	14	15	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Cesium-137	.0275	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Radium-226	TBD	NV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Technetium-99	2.01	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Thorium-228	.678	NV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Thorium-230	8.32	UNV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Thorium-232	.676	NV	pCi/g	482274.01	1348323.58
	A6-SWL-19-30-R	20020620	14	15	Uranium, Total	4.08	NV	mg/kg	482274.01	1348323.58
A6-SWL-20	A6-SWL-20-10-R	20020620	4	5	Moisture Content	40.1	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20-10-R	20020620	4	5	Thorium-228	2.8	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-10-R	20020620	4	5	Thorium-230	22.2	NV	mg/kg	482140.62	1348231.93
	A6-SWL-20-10-R	20020620	4	5	Thorium-230	5.4	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-10-R	20020620	4	5	Thorium-232	2.7	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-2-R	20020620	4	5	Moisture Content	34.8	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20-2-R	20020620	0	1	Thorium-228	2.3	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-2-R	20020620	0	1	Thorium-230	15.5	NV	mg/kg	482140.62	1348231.93
	A6-SWL-20-2-R	20020620	0	1	Thorium-230	9.8	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-2-R	20020620	0	1	Thorium-232	2.1	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-4-R	20020620	1	2	Moisture Content	36.9	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20-4-R	20020620	1	2	Thorium-228	2.3	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-4-R	20020620	1	2	Thorium-230	18.3	NV	mg/kg	482140.62	1348231.93
	A6-SWL-20-4-R	20020620	1	2	Thorium-230	4.6	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-4-R	20020620	1	2	Thorium-232	2.4	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-6-R	20020620	2	3	Moisture Content	35.7	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20-6-R	20020620	2	3	Thorium-228	2.5	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-6-R	20020620	2	3	Thorium-230	20.3	NV	mg/kg	482140.62	1348231.93
	A6-SWL-20-6-R	20020620	2	3	Thorium-230	8.3	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-6-R	20020620	2	3	Thorium-232	2.4	NV	pCi/g	482140.62	1348231.93

000256

4439

APPENDIX C
PREDESIGN CHARACTERIZATION DATA - SOLID WASTE LANDFILL

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-SWL-20-8-R	20020620	3	4	Moisture Content	40.2	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20-8-R	20020620	3	4	Thorium-228	3	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-8-R	20020620	3	4	Thorium-230	22.7	NV	mg/kg	482140.62	1348231.93
	A6-SWL-20-8-R	20020620	3	4	Thorium-230	4.3	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20-8-R	20020620	3	4	Thorium-232	2.7	NV	pCi/g	482140.62	1348231.93
	A6-SWL-20A-12B-R	20020620	5	6	Moisture Content	30.3	NV	PERCENT	482140.62	1348231.93
	A6-SWL-20A-12B-R	20020620	5	6	Uranium, Total	1325	NV	mg/kg dry	482140.62	1348231.93
A6-SWL-21	A6-SWL-21-21-P	20020627	9.5	10.5	Aroclor-1254	.042	UNV	ug/kg	482165.80	1348321.31
	A6-SWL-21-21-P	20020627	9.5	10.5	Aroclor-1260	.042	UNV	ug/kg	482165.80	1348321.31
A6-SWL-22	A6-SWL-22-21-P	20020627	9.5	10.5	Aroclor-1254	.042	UNV	ug/kg	482160.80	1348316.31
	A6-SWL-22-21-P	20020627	9.5	10.5	Aroclor-1260	.042	UNV	ug/kg	482160.80	1348316.31

000257

1443

APPENDIX D

FIRE TRAINING FACILITY
PREDESIGN CHARACTERIZATION DATA

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-1	A6-FTF-1-12-L	20020617	5	6	1,1,1-Trichloroethane	430	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-L	20020617	5	6	1,1,2-Trichloroethane	430	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-L	20020617	5	6	Tetrachloroethene	360	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-L	20020617	5	6	Toluene	1000000	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-M	20020617	5	6	Arsenic	8.98	NV	mg/kg	482684.90	1349390.40
	A6-FTF-1-12-M	20020617	5	6	Beryllium	1.05	NV	mg/kg	482684.90	1349390.40
	A6-FTF-1-12-P	20020617	5	6	Aroclor-1254	41	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-P	20020617	5	6	Aroclor-1260	41	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Cesium-137	.0475	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Radium-226	TBD	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Technetium-99	1.78	UNV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Thorium-228	1.19	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Thorium-230	13.1	UNV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Thorium-232	1.19	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-12-R	20020617	5	6	Uranium, Total	4.63	NV	mg/kg	482684.90	1349390.40
	A6-FTF-1-2-D	20020617	0	1	Heptachlorodibenzo-p-dioxins	80	U	ng/kg	482684.90	1349390.40
	A6-FTF-1-2-D	20020617	0	1	Octachlorodibenzo-p-dioxin	800	U	ng/kg	482684.90	1349390.40
	A6-FTF-1-2-L	20020617	0	1	1,1,1-Trichloroethane	430	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-L	20020617	0	1	1,1,2-Trichloroethane	430	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-L	20020617	0	1	Tetrachloroethene	360	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-L	20020617	0	1	Toluene	1000000	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-M	20020617	0	1	Arsenic	6.27	NV	mg/kg	482684.90	1349390.40
	A6-FTF-1-2-M	20020617	0	1	Beryllium	.903	NV	mg/kg	482684.90	1349390.40
	A6-FTF-1-2-P	20020617	0	1	Aroclor-1254	41	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-P	20020617	0	1	Aroclor-1260	41	UNV	ug/kg	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Cesium-137	.105	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Radium-226	TBD	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Technetium-99	1.49	UNV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Thorium-228	.957	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Thorium-230	11.4	UNV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Thorium-232	.952	NV	pCi/g	482684.90	1349390.40
	A6-FTF-1-2-R	20020617	0	1	Uranium, Total	11.3	NV	mg/kg	482684.90	1349390.40

000259

4439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-2	A6-FTF-2-12-L	20020617	5	6	1,1,1-Trichloroethane	430	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-L	20020617	5	6	1,1,2-Trichloroethane	430	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-L	20020617	5	6	Tetrachloroethene	360	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-L	20020617	5	6	Toluene	1000000	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-M	20020617	5	6	Arsenic	7.21	NV	mg/kg	482683.70	1349453.22
	A6-FTF-2-12-M	20020617	5	6	Beryllium	1.15	NV	mg/kg	482683.70	1349453.22
	A6-FTF-2-12-P	20020617	5	6	Aroclor-1254	38	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-P	20020617	5	6	Aroclor-1260	38	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Cesium-137	.0423	UNV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Radium-226	TBD	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Technetium-99	1.79	UNV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Thorium-228	.91	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Thorium-230	11.1	UNV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Thorium-232	.892	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-12-R	20020617	5	6	Uranium, Total	4.16	NV	mg/kg	482683.70	1349453.22
	A6-FTF-2-2-D	20020617	0	1	Heptachlorodibenzo-p-dioxins	80	U	ng/kg	482683.70	1349453.22
	A6-FTF-2-2-D	20020617	0	1	Octachlorodibenzo-p-dioxin	800	U	ng/kg	482683.70	1349453.22
	A6-FTF-2-2-L	20020617	0	1	1,1,1-Trichloroethane	430	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-L	20020617	0	1	1,1,2-Trichloroethane	430	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-L	20020617	0	1	Tetrachloroethene	360	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-L	20020617	0	1	Toluene	1000000	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-M	20020617	0	1	Arsenic	9.63	NV	mg/kg	482683.70	1349453.22
	A6-FTF-2-2-M	20020617	0	1	Beryllium	1.01	NV	mg/kg	482683.70	1349453.22
	A6-FTF-2-2-P	20020617	0	1	Aroclor-1254	47	UNV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-P	20020617	0	1	Aroclor-1260	13	NV	ug/kg	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Cesium-137	.375	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Radium-226	TBD	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Technetium-99	1.48	UNV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Thorium-228	1.05	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Thorium-230	12.6	UNV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Thorium-232	1.04	NV	pCi/g	482683.70	1349453.22
	A6-FTF-2-2-R	20020617	0	1	Uranium, Total	22.2	NV	mg/kg	482683.70	1349453.22
A6-FTF-3	A6-FTF-3-12-L	20020617	5	6	1,1,1-Trichloroethane	430	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-L	20020617	5	6	1,1,2-Trichloroethane	430	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-L	20020617	5	6	Tetrachloroethene	360	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-L	20020617	5	6	Toluene	1000000	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-M	20020617	5	6	Arsenic	5.66	NV	mg/kg	482682.93	1349510.66

Note: Radium-226 results are not yet available

000260
4439

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-3-12-M	20020617	5	6	Beryllium	.717	NV	mg/kg	482682.93	1349510.66
	A6-FTF-3-12-P	20020617	5	6	Aroclor-1254	4.7	NV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-P	20020617	5	6	Aroclor-1260	37	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Cesium-137	.0398	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Radium-226	TBD	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Technetium-99	1.73	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Thorium-228	.826	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Thorium-230	13	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Thorium-232	.845	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-12-R	20020617	5	6	Uranium, Total	2.6	NV	mg/kg	482682.93	1349510.66
	A6-FTF-3-2-D	20020617	0	1	Heptachlorodibenzo-p-dioxins	80	U	ng/kg	482682.93	1349510.66
	A6-FTF-3-2-D	20020617	0	1	Octachlorodibenzo-p-dioxin	800	U	ng/kg	482682.93	1349510.66
	A6-FTF-3-2-L	20020617	0	1	1,1,1-Trichloroethane	430	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-L	20020617	0	1	1,1,2-Trichloroethane	430	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-L	20020617	0	1	Tetrachloroethene	360	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-L	20020617	0	1	Toluene	1000000	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-M	20020617	0	1	Arsenic	5.27	NV	mg/kg	482682.93	1349510.66
	A6-FTF-3-2-M	20020617	0	1	Beryllium	.519	NV	mg/kg	482682.93	1349510.66
	A6-FTF-3-2-P	20020617	0	1	Aroclor-1254	40	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-P	20020617	0	1	Aroclor-1260	40	UNV	ug/kg	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Cesium-137	.0423	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Radium-226	TBD	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Technetium-99	1.77	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Thorium-228	1.15	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Thorium-230	12.1	UNV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Thorium-232	1.17	NV	pCi/g	482682.93	1349510.66
	A6-FTF-3-2-R	20020617	0	1	Uranium, Total	10.9	NV	mg/kg	482682.93	1349510.66
A6-FTF-4	A6-FTF-4-12-L	20020616	5	6	1,1,1-Trichloroethane	500	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-L	20020616	5	6	1,1,2-Trichloroethane	500	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-L	20020616	5	6	Tetrachloroethene	420	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-L	20020616	5	6	Toluene	.46	NV	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-M	20020614	5	6	Arsenic	5.52	-	mg/kg	482637.83	1349483.02
	A6-FTF-4-12-M	20020614	5	6	Beryllium	.812	J	mg/kg	482637.83	1349483.02
	A6-FTF-4-12-P	20020616	5	6	Aroclor-1254	38	U	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-P	20020616	5	6	Aroclor-1260	38	U	ug/kg	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Cesium-137	.0582	UNV	pCi/g	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482637.83	1349483.02

000261

4439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-4-12-R	20020616	5	6	Technetium-99	2.31	UNV	pCi/g	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Thorium-228	.841	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Thorium-230	8.52	UNV	pCi/g	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Thorium-232	.835	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-12-R	20020616	5	6	Uranium, Total	2.24	NV	mg/kg	482637.83	1349483.02
	A6-FTF-4-2-D	20020616	0	1	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482637.83	1349483.02
	A6-FTF-4-2-D	20020616	0	1	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482637.83	1349483.02
	A6-FTF-4-2-L	20020616	0	1	1,1,1-Trichloroethane	520	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-L	20020616	0	1	1,1,2-Trichloroethane	520	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-L	20020616	0	1	Tetrachloroethene	440	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-L	20020616	0	1	Toluene	1220000	UNV	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-M	20020616	0	1	Arsenic	10.1	-	mg/kg	482637.83	1349483.02
	A6-FTF-4-2-M	20020616	0	1	Beryllium	1.05	-	mg/kg	482637.83	1349483.02
	A6-FTF-4-2-P	20020616	0	1	Aroclor-1254	2	J	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-P	20020616	0	1	Aroclor-1260	42	U	ug/kg	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Cesium-137	.0444	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Technetium-99	1.82	UNV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Thorium-228	1.23	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Thorium-230	4.2	UNV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Thorium-232	1.23	NV	pCi/g	482637.83	1349483.02
	A6-FTF-4-2-R	20020616	0	1	Uranium, Total	7.44	NV	mg/kg	482637.83	1349483.02
A6-FTF-5	A6-FTF-5-18-P	20020612	8	9	Aroclor-1254	38	UNV	ug/kg	482597.01	1349358.62
	A6-FTF-5-18-P	20020612	8	9	Aroclor-1260	38	UNV	ug/kg	482597.01	1349358.62
	A6-FTF-5-18-R	20020612	8	9	Moisture Content	13.6	NV	PERCENT	482597.01	1349358.62
	A6-FTF-5-18-R	20020612	8	9	Technetium-99	1.7	UNV	pCi/g	482597.01	1349358.62
	A6-FTF-5-18-R	20020612	8	9	Thorium, Total	5.36	NV	mg/kg dry	482597.01	1349358.62
	A6-FTF-5-18-R	20020612	8	9	Uranium, Total	1.46	NV	mg/kg dry	482597.01	1349358.62
	A6-FTF-5-2-P	20020612	0	1	Aroclor-1254	170	UNV	ug/kg	482597.01	1349358.62
	A6-FTF-5-2-P	20020612	0	1	Aroclor-1260	170	UNV	ug/kg	482597.01	1349358.62
	A6-FTF-5-2-R	20020612	0	1	Moisture Content	5.9	NV	PERCENT	482597.01	1349358.62
	A6-FTF-5-2-R	20020612	0	1	Technetium-99	1.7	UNV	pCi/g	482597.01	1349358.62
	A6-FTF-5-2-R	20020612	0	1	Thorium, Total	2.92	NV	mg/kg dry	482597.01	1349358.62
	A6-FTF-5-2-R	20020612	0	1	Uranium, Total	6.26	NV	mg/kg dry	482597.01	1349358.62
	A6-FTF-5-8-P	20020612	3	4	Aroclor-1254	16	NV	ug/kg	482597.01	1349358.62
	A6-FTF-5-8-P	20020612	3	4	Aroclor-1260	41	UNV	ug/kg	482597.01	1349358.62
	A6-FTF-5-8-R	20020612	3	4	Moisture Content	20	NV	PERCENT	482597.01	1349358.62

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-5-8-R	20020612	3	4	Technetium-99	4.9	NV	pCi/g	482597.01	1349358.62
	A6-FTF-5-8-R	20020612	3	4	Thorium, Total	9.71	NV	mg/kg dry	482597.01	1349358.62
	A6-FTF-5-8-R	20020612	3	4	Uranium, Total	8.04	NV	mg/kg dry	482597.01	1349358.62
A6-FTF-6	A6-FTF-6-18-P	20020611	8	9	Aroclor-1254	42	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-18-P	20020611	8	9	Aroclor-1260	42	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-18-R	20020611	8	9	Moisture Content	14.9	NV	PERCENT	482610.09	1349370.68
	A6-FTF-6-18-R	20020611	8	9	Technetium-99	2.3	NV	pCi/g	482610.09	1349370.68
	A6-FTF-6-18-R	20020611	8	9	Thorium, Total	4.77	NV	mg/kg dry	482610.09	1349370.68
	A6-FTF-6-18-R	20020611	8	9	Uranium, Total	2.16	NV	mg/kg dry	482610.09	1349370.68
	A6-FTF-6-2-P	20020611	0	1	Aroclor-1254	42	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-2-P	20020611	0	1	Aroclor-1260	42	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-2-R	20020611	0	1	Moisture Content	10.1	NV	PERCENT	482610.09	1349370.68
	A6-FTF-6-2-R	20020611	0	1	Technetium-99	2.1	NV	pCi/g	482610.09	1349370.68
	A6-FTF-6-2-R	20020611	0	1	Thorium, Total	4.15	NV	mg/kg dry	482610.09	1349370.68
	A6-FTF-6-2-R	20020611	0	1	Uranium, Total	6.84	NV	mg/kg dry	482610.09	1349370.68
	A6-FTF-6-8-P	20020611	3	4	Aroclor-1254	41	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-8-P	20020611	3	4	Aroclor-1260	41	U	ug/kg	482610.09	1349370.68
	A6-FTF-6-8-R	20020611	3	4	Moisture Content	19.4	NV	PERCENT	482610.09	1349370.68
	A6-FTF-6-8-R	20020611	3	4	Technetium-99	1.9	NV	pCi/g	482610.09	1349370.68
	A6-FTF-6-8-R	20020611	3	4	Thorium, Total	8.79	NV	mg/kg dry	482610.09	1349370.68
	A6-FTF-6-8-R	20020611	3	4	Uranium, Total	4.88	NV	mg/kg dry	482610.09	1349370.68
A6-FTF-7	A6-FTF-7-10-L	20020611	4	5	1,1,1-Trichloroethane	2.3	NV	ug/kg	482611.47	1349391.64
	A6-FTF-7-10-L	20020611	4	5	1,1,2-Trichloroethane	540	UNV	ug/kg	482611.47	1349391.64
	A6-FTF-7-10-L	20020611	4	5	Tetrachloroethene	1.9	NV	ug/kg	482611.47	1349391.64
	A6-FTF-7-10-L	20020611	4	5	Toluene	.79	NV	ug/kg	482611.47	1349391.64
	A6-FTF-7-18-P	20020611	8	9	Aroclor-1254	38	U	ug/kg	482611.47	1349391.64
	A6-FTF-7-18-P	20020611	8	9	Aroclor-1260	38	U	ug/kg	482611.47	1349391.64
	A6-FTF-7-18-R	20020611	8	9	Moisture Content	11.7	NV	PERCENT	482611.47	1349391.64
	A6-FTF-7-18-R	20020611	8	9	Technetium-99	1.8	UNV	pCi/g	482611.47	1349391.64
	A6-FTF-7-18-R	20020611	8	9	Thorium, Total	5.01	NV	mg/kg dry	482611.47	1349391.64
	A6-FTF-7-18-R	20020611	8	9	Uranium, Total	1.51	NV	mg/kg dry	482611.47	1349391.64
	A6-FTF-7-2-P	20020611	0	1	Aroclor-1254	20	J	ug/kg	482611.47	1349391.64
	A6-FTF-7-2-P	20020611	0	1	Aroclor-1260	120	-	ug/kg	482611.47	1349391.64
	A6-FTF-7-2-R	20020611	0	1	Moisture Content	9.5	NV	PERCENT	482611.47	1349391.64
	A6-FTF-7-2-R	20020611	0	1	Technetium-99	2.5	NV	pCi/g	482611.47	1349391.64
	A6-FTF-7-2-R	20020611	0	1	Thorium, Total	4.96	NV	mg/kg dry	482611.47	1349391.64
	A6-FTF-7-2-R	20020611	0	1	Uranium, Total	16.7	NV	mg/kg dry	482611.47	1349391.64

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Note: Radium-226 results are not yet available.

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-9	A6-FTF-9-12-P	20020612	5	6	Aroclor-1254	38	U	ug/kg	482607.20	1349429.20
	A6-FTF-9-12-P	20020612	5	6	Aroclor-1260	38	U	ug/kg	482607.20	1349429.20
	A6-FTF-9-12-R	20020612	5	6	Moisture Content	12.9	NV	PERCENT	482607.20	1349429.20
	A6-FTF-9-12-R	20020612	5	6	Technetium-99	1.8	UNV	pCi/g	482607.20	1349429.20
	A6-FTF-9-12-R	20020612	5	6	Thorium, Total	5.53	NV	mg/kg dry	482607.20	1349429.20
	A6-FTF-9-12-R	20020612	5	6	Uranium, Total	1.33	NV	mg/kg dry	482607.20	1349429.20
	A6-FTF-9-2-P	20020612	0	1	Aroclor-1254	8	J	ug/kg	482607.20	1349429.20
	A6-FTF-9-2-P	20020612	0	1	Aroclor-1260	16	J	ug/kg	482607.20	1349429.20
	A6-FTF-9-2-R	20020612	0	1	Moisture Content	17.7	NV	PERCENT	482607.20	1349429.20
	A6-FTF-9-2-R	20020612	0	1	Technetium-99	1.6	UNV	pCi/g	482607.20	1349429.20
	A6-FTF-9-2-R	20020612	0	1	Thorium, Total	7.61	NV	mg/kg dry	482607.20	1349429.20
	A6-FTF-9-2-R	20020612	0	1	Uranium, Total	10.6	NV	mg/kg dry	482607.20	1349429.20
A6-FTF-10	A6-FTF-10-12-M	20020612	5	6	Arsenic	6.33	NV	mg/kg	482593.90	1349482.20
	A6-FTF-10-12-M	20020612	5	6	Beryllium	.81	NV	mg/kg	482593.90	1349482.20
	A6-FTF-10-12-P	20020612	5	6	Aroclor-1254	38	U	ug/kg	482593.90	1349482.20
	A6-FTF-10-12-P	20020612	5	6	Aroclor-1260	38	U	ug/kg	482593.90	1349482.20
	A6-FTF-10-12-R	20020612	5	6	Moisture Content	12.8	NV	PERCENT	482593.90	1349482.20
	A6-FTF-10-12-R	20020612	5	6	Technetium-99	1.8	UNV	pCi/g	482593.90	1349482.20
	A6-FTF-10-12-R	20020612	5	6	Thorium, Total	5.73	NV	mg/kg dry	482593.90	1349482.20
	A6-FTF-10-12-R	20020612	5	6	Uranium, Total	1.42	NV	mg/kg dry	482593.90	1349482.20
	A6-FTF-10-2-M	20020612	0	1	Arsenic	8.19	NV	mg/kg	482593.90	1349482.20
	A6-FTF-10-2-M	20020612	0	1	Beryllium	.725	NV	mg/kg	482593.90	1349482.20
	A6-FTF-10-2-P	20020612	0	1	Aroclor-1254	39	U	ug/kg	482593.90	1349482.20
	A6-FTF-10-2-P	20020612	0	1	Aroclor-1260	5	J	ug/kg	482593.90	1349482.20
	A6-FTF-10-2-R	20020612	0	1	Moisture Content	14.8	NV	PERCENT	482593.90	1349482.20
	A6-FTF-10-2-R	20020612	0	1	Technetium-99	1.7	UNV	pCi/g	482593.90	1349482.20
	A6-FTF-10-2-R	20020612	0	1	Thorium, Total	6.23	NV	mg/kg dry	482593.90	1349482.20
	A6-FTF-10-2-R	20020612	0	1	Uranium, Total	4.64	NV	mg/kg dry	482593.90	1349482.20
A6-FTF-11	A6-FTF-11-12-M	20020612	5	6	Arsenic	6.07	NV	mg/kg	482575.12	1349519.79
	A6-FTF-11-12-M	20020612	5	6	Beryllium	.737	NV	mg/kg	482575.12	1349519.79
	A6-FTF-11-12-P	20020612	5	6	Aroclor-1254	38	U	ug/kg	482575.12	1349519.79
	A6-FTF-11-12-P	20020612	5	6	Aroclor-1260	38	U	ug/kg	482575.12	1349519.79
	A6-FTF-11-12-R	20020612	5	6	Moisture Content	13.4	NV	PERCENT	482575.12	1349519.79
	A6-FTF-11-12-R	20020612	5	6	Technetium-99	1.7	UNV	pCi/g	482575.12	1349519.79
	A6-FTF-11-12-R	20020612	5	6	Thorium, Total	5.66	NV	mg/kg dry	482575.12	1349519.79
	A6-FTF-11-12-R	20020612	5	6	Uranium, Total	1.44	NV	mg/kg dry	482575.12	1349519.79
	A6-FTF-11-2-M	20020612	0	1	Arsenic	9.57	NV	mg/kg	482575.12	1349519.79

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-11-2-M	20020612	0	1	Beryllium	.987	NV	mg/kg	482575.12	1349519.79
	A6-FTF-11-2-P	20020612	0	1	Aroclor-1254	42	U	ug/kg	482575.12	1349519.79
	A6-FTF-11-2-P	20020612	0	1	Aroclor-1260	42	U	ug/kg	482575.12	1349519.79
	A6-FTF-11-2-R	20020612	0	1	Moisture Content	19.3	NV	PERCENT	482575.12	1349519.79
	A6-FTF-11-2-R	20020612	0	1	Technetium-99	1.8	UNV	pCi/g	482575.12	1349519.79
	A6-FTF-11-2-R	20020612	0	1	Thorium, Total	9.01	NV	mg/kg dry	482575.12	1349519.79
	A6-FTF-11-2-R	20020612	0	1	Uranium, Total	2.02	NV	mg/kg dry	482575.12	1349519.79
A6-FTF-12	A6-FTF-12-12-M	20020612	5	6	Arsenic	6.88	NV	mg/kg	482539.52	1349488.73
	A6-FTF-12-12-M	20020612	5	6	Beryllium	.647	NV	mg/kg	482539.52	1349488.73
	A6-FTF-12-12-P	20020612	5	6	Aroclor-1254	37	U	ug/kg	482539.52	1349488.73
	A6-FTF-12-12-P	20020612	5	6	Aroclor-1260	37	U	ug/kg	482539.52	1349488.73
	A6-FTF-12-12-R	20020612	5	6	Moisture Content	12.9	NV	PERCENT	482539.52	1349488.73
	A6-FTF-12-12-R	20020612	5	6	Technetium-99	1.8	UNV	pCi/g	482539.52	1349488.73
	A6-FTF-12-12-R	20020612	5	6	Thorium, Total	5.4	NV	mg/kg dry	482539.52	1349488.73
	A6-FTF-12-12-R	20020612	5	6	Uranium, Total	1.47	NV	mg/kg dry	482539.52	1349488.73
	A6-FTF-12-2-P	20020612	0	1	Aroclor-1254	10	J	ug/kg	482539.52	1349488.73
	A6-FTF-12-2-P	20020612	0	1	Aroclor-1260	85	-	ug/kg	482539.52	1349488.73
	A6-FTF-12-2-R	20020612	0	1	Moisture Content	14.8	NV	PERCENT	482539.52	1349488.73
	A6-FTF-12-2-R	20020612	0	1	Technetium-99	4.2	NV	pCi/g	482539.52	1349488.73
	A6-FTF-12-2-R	20020612	0	1	Thorium, Total	7.02	NV	mg/kg dry	482539.52	1349488.73
	A6-FTF-12-2-R	20020612	0	1	Uranium, Total	13.1	NV	mg/kg dry	482539.52	1349488.73
A6-FTF-13	A6-FTF-13-12-R	20020527	5	6	Moisture Content	14	NV	PERCENT	482534.61	1349488.86
	A6-FTF-13-12-R	20020527	5	6	Technetium-99	1.9	UNV	pCi/g	482534.61	1349488.86
	A6-FTF-13-12-R	20020527	5	6	Thorium, Total	5.68	NV	mg/kg dry	482534.61	1349488.86
	A6-FTF-13-12-R	20020527	5	6	Uranium, Total	1.88	NV	mg/kg dry	482534.61	1349488.86
	A6-FTF-13-2-R	20020527	0	1	Moisture Content	17	NV	PERCENT	482534.61	1349488.86
	A6-FTF-13-2-R	20020527	0	1	Technetium-99	1.8	UNV	pCi/g	482534.61	1349488.86
	A6-FTF-13-2-R	20020527	0	1	Thorium, Total	8.81	NV	mg/kg dry	482534.61	1349488.86
	A6-FTF-13-2-R	20020527	0	1	Uranium, Total	6.45	NV	mg/kg dry	482534.61	1349488.86
	A6-FTF-13-4-R	20020527	1	2	Moisture Content	17.2	NV	PERCENT	482534.61	1349488.86
	A6-FTF-13-4-R	20020527	1	2	Uranium, Total	2.69	NV	mg/kg dry	482534.61	1349488.86
A6-FTF-14	A6-FTF-14-12-R	20020527	5	6	Moisture Content	12.6	NV	PERCENT	482534.43	1349498.96
	A6-FTF-14-12-R	20020527	5	6	Technetium-99	1.8	UNV	pCi/g	482534.43	1349498.96
	A6-FTF-14-12-R	20020527	5	6	Thorium, Total	4.85	NV	mg/kg dry	482534.43	1349498.96
	A6-FTF-14-12-R	20020527	5	6	Uranium, Total	1.88	NV	mg/kg dry	482534.43	1349498.96
	A6-FTF-14-2-R	20020527	5	6	Moisture Content	19.8	NV	PERCENT	482534.43	1349498.96
	A6-FTF-14-2-R	20020527	0	1	Technetium-99	1.9	UNV	pCi/g	482534.43	1349498.96

Note: Radium-226 results are not yet available

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APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-14-2-R	20020527	0	1	Thorium, Total	8.53	NV	mg/kg dry	482534.43	1349498.96
	A6-FTF-14-2-R	20020527	0	1	Uranium, Total	8.56	NV	mg/kg dry	482534.43	1349498.96
	A6-FTF-14-4-R	20020527	1	2	Moisture Content	16.4	NV	PERCENT	482534.43	1349498.96
	A6-FTF-14-4-R	20020527	1	2	Uranium, Total	3.3	NV	mg/kg dry	482534.43	1349498.96
A6-FTF-15	A6-FTF-15-12-R	20020527	5	6	Moisture Content	12.5	NV	PERCENT	482529.72	1349493.65
	A6-FTF-15-12-R	20020527	5	6	Technetium-99	1.8	UNV	pCi/g	482529.72	1349493.65
	A6-FTF-15-12-R	20020527	5	6	Thorium, Total	4.96	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-15-12-R	20020527	5	6	Uranium, Total	3.28	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-15-2-R	20020527	0	1	Moisture Content	21.5	NV	PERCENT	482529.72	1349493.65
	A6-FTF-15-2-R	20020527	0	1	Technetium-99	17	NV	pCi/g	482529.72	1349493.65
	A6-FTF-15-2-R	20020527	0	1	Thorium, Total	6.61	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-15-2-R	20020527	0	1	Uranium, Total	75.4	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-15-4-R	20020527	1	2	Moisture Content	21.5	NV	PERCENT	482529.72	1349493.65
	A6-FTF-15-4-R	20020527	1	2	Uranium, Total	135	NV	mg/kg dry	482529.72	1349493.65
A6-FTF-16	A6-FTF-16-12-R	20020527	5	6	Moisture Content	12.3	NV	PERCENT	482524.77	1349498.69
	A6-FTF-16-12-R	20020527	5	6	Technetium-99	1.9	UNV	pCi/g	482524.77	1349498.69
	A6-FTF-16-12-R	20020527	5	6	Thorium, Total	5.34	NV	mg/kg dry	482524.77	1349498.69
	A6-FTF-16-12-R	20020527	5	6	Uranium, Total	1.91	NV	mg/kg dry	482524.77	1349498.69
	A6-FTF-16-2-R	20020527	0	1	Moisture Content	19.2	NV	PERCENT	482524.77	1349498.69
	A6-FTF-16-2-R	20020527	0	1	Technetium-99	1.7	UNV	pCi/g	482524.77	1349498.69
	A6-FTF-16-2-R	20020527	0	1	Thorium, Total	8.75	NV	mg/kg dry	482524.77	1349498.69
	A6-FTF-16-2-R	20020527	0	1	Uranium, Total	12.8	NV	mg/kg dry	482524.77	1349498.69
	A6-FTF-16-4-R	20020527	1	2	Moisture Content	20.8	NV	PERCENT	482524.77	1349498.69
	A6-FTF-16-4-R	20020527	1	2	Uranium, Total	5.2	NV	mg/kg dry	482524.77	1349498.69
A6-FTF-17	A6-FTF-17-12-R	20020604	5	6	Moisture Content	12.7	NV	PERCENT	482529.72	1349493.65
	A6-FTF-17-12-R	20020604	5	6	Technetium-99	2.1	UNV	pCi/g	482529.72	1349493.65
	A6-FTF-17-12-R	20020604	5	6	Thorium, Total	5.1	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-17-12-R	20020604	5	6	Uranium, Total	2.42	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-17-2-R	20020527	0	1	Moisture Content	16.9	NV	PERCENT	482529.72	1349493.65
	A6-FTF-17-2-R	20020527	0	1	Technetium-99	11	NV	pCi/g	482529.72	1349493.65
	A6-FTF-17-2-R	20020527	0	1	Thorium, Total	8.01	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-17-2-R	20020527	0	1	Uranium, Total	83.4	NV	mg/kg dry	482529.72	1349493.65
	A6-FTF-17-4-R	20020527	1	2	Moisture Content	17.7	NV	PERCENT	482529.72	1349493.65
	A6-FTF-17-4-R	20020527	1	2	Uranium, Total	37.7	NV	mg/kg dry	482529.72	1349493.65
A6-FTF-18	A6-FTF-18-12-M	20020612	5	6	Arsenic	6.17	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-12-M	20020612	5	6	Beryllium	.721	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-12-P	20020612	5	6	Aroclor-1254	40	UNV	ug/kg	482524.35	1349488.22

000266

4439

Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-18-12-P	20020612	5	6	Aroclor-1260	40	UNV	ug/kg	482524.35	1349488.22
	A6-FTF-18-12-R	20020612	5	6	Moisture Content	15.1	NV	PERCENT	482524.35	1349488.22
	A6-FTF-18-12-R	20020612	5	6	Technetium-99	1.7	UNV	pCi/g	482524.35	1349488.22
	A6-FTF-18-12-R	20020612	5	6	Thorium, Total	6.42	NV	mg/kg dry	482524.35	1349488.22
	A6-FTF-18-12-R	20020612	5	6	Uranium, Total	3.12	NV	mg/kg dry	482524.35	1349488.22
	A6-FTF-18-2-M	20020612	0	1	Arsenic	7.95	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-2-M	20020612	0	1	Beryllium	.902	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-2-P	20020612	0	1	Aroclor-1254	11	J	ug/kg	482524.35	1349488.22
	A6-FTF-18-2-P	20020612	0	1	Aroclor-1260	54	J	ug/kg	482524.35	1349488.22
	A6-FTF-18-2-R	20020612	0	1	Moisture Content	16.7	NV	PERCENT	482524.35	1349488.22
	A6-FTF-18-2-R	20020612	0	1	Technetium-99	7	NV	pCi/g	482524.35	1349488.22
	A6-FTF-18-2-R	20020612	0	1	Thorium, Total	7.47	NV	mg/kg dry	482524.35	1349488.22
	A6-FTF-18-2-R	20020612	0	1	Uranium, Total	12.9	NV	mg/kg dry	482524.35	1349488.22
	A6-FTF-18-6-M	20020612	2	3	Arsenic	11.3	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-6-M	20020612	2	3	Beryllium	.968	NV	mg/kg	482524.35	1349488.22
	A6-FTF-18-6-P	20020612	2	3	Aroclor-1254	41	U	ug/kg	482524.35	1349488.22
	A6-FTF-18-6-P	20020612	2	3	Aroclor-1260	41	U	ug/kg	482524.35	1349488.22
	A6-FTF-18-6-R	20020612	2	3	Moisture Content	18.5	NV	PERCENT	482524.35	1349488.22
	A6-FTF-18-6-R	20020612	2	3	Technetium-99	3.6	NV	pCi/g	482524.35	1349488.22
	A6-FTF-18-6-R	20020612	2	3	Thorium, Total	9.04	NV	mg/kg dry	482524.35	1349488.22
	A6-FTF-18-6-R	20020612	2	3	Uranium, Total	2.44	NV	mg/kg dry	482524.35	1349488.22
A6-FTF-19	A6-FTF-19-12-M	20020612	5	6	Arsenic	6.7	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-12-M	20020612	5	6	Beryllium	.773	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-12-P	20020612	5	6	Aroclor-1254	39	UNV	ug/kg	482512.89	1349442.56
	A6-FTF-19-12-P	20020612	5	6	Aroclor-1260	39	UNV	ug/kg	482512.89	1349442.56
	A6-FTF-19-12-R	20020612	5	6	Moisture Content	14.1	NV	PERCENT	482512.89	1349442.56
	A6-FTF-19-12-R	20020612	5	6	Technetium-99	1.7	UNV	pCi/g	482512.89	1349442.56
	A6-FTF-19-12-R	20020612	5	6	Thorium, Total	6.74	NV	mg/kg dry	482512.89	1349442.56
	A6-FTF-19-12-R	20020612	5	6	Uranium, Total	2.06	NV	mg/kg dry	482512.89	1349442.56
	A6-FTF-19-2-M	20020612	0	1	Arsenic	6.22	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-2-M	20020612	0	1	Beryllium	.549	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-2-P	20020612	0	1	Aroclor-1254	90	NV	ug/kg	482512.89	1349442.56
	A6-FTF-19-2-P	20020612	0	1	Aroclor-1260	56	NV	ug/kg	482512.89	1349442.56
	A6-FTF-19-2-R	20020612	0	1	Moisture Content	11.3	NV	PERCENT	482512.89	1349442.56
	A6-FTF-19-2-R	20020612	0	1	Technetium-99	1.5	UNV	pCi/g	482512.89	1349442.56
	A6-FTF-19-2-R	20020612	0	1	Thorium, Total	4.53	NV	mg/kg dry	482512.89	1349442.56
	A6-FTF-19-2-R	20020612	0	1	Uranium, Total	10.6	NV	mg/kg dry	482512.89	1349442.56

000267

14439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-19-6-M	20020612	2	3	Arsenic	6.35	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-6-M	20020612	2	3	Beryllium	.843	NV	mg/kg	482512.89	1349442.56
	A6-FTF-19-6-P	20020612	2	3	Aroclor-1254	25	NV	ug/kg	482512.89	1349442.56
	A6-FTF-19-6-P	20020612	2	3	Aroclor-1260	190	NV	ug/kg	482512.89	1349442.56
	A6-FTF-19-6-R	20020612	2	3	Moisture Content	13.2	NV	PERCENT	482512.89	1349442.56
	A6-FTF-19-6-R	20020612	2	3	Technetium-99	1.8	UNV	pCi/g	482512.89	1349442.56
	A6-FTF-19-6-R	20020612	2	3	Thorium, Total	6.01	NV	mg/kg dry	482512.89	1349442.56
	A6-FTF-19-6-R	20020612	2	3	Uranium, Total	18.1	NV	mg/kg dry	482512.89	1349442.56
A6-FTF-20	A6-FTF-20-12-M	20020612	5	6	Arsenic	6.52	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-12-M	20020612	5	6	Beryllium	.86	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-12-P	20020612	5	6	Aroclor-1254	41	UNV	ug/kg	482497.05	1349426.97
	A6-FTF-20-12-P	20020612	5	6	Aroclor-1260	3.8	NV	ug/kg	482497.05	1349426.97
	A6-FTF-20-12-R	20020612	5	6	Moisture Content	14.8	NV	PERCENT	482497.05	1349426.97
	A6-FTF-20-12-R	20020612	5	6	Technetium-99	5	NV	pCi/g	482497.05	1349426.97
	A6-FTF-20-12-R	20020612	5	6	Thorium, Total	6.29	NV	mg/kg dry	482497.05	1349426.97
	A6-FTF-20-12-R	20020612	5	6	Uranium, Total	6.06	NV	mg/kg dry	482497.05	1349426.97
	A6-FTF-20-2-M	20020612	0	1	Arsenic	8.26	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-2-M	20020612	0	1	Beryllium	.781	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-2-P	20020612	0	1	Aroclor-1254	42	UNV	ug/kg	482497.05	1349426.97
	A6-FTF-20-2-P	20020612	0	1	Aroclor-1260	13	NV	ug/kg	482497.05	1349426.97
	A6-FTF-20-2-R	20020612	0	1	Moisture Content	19.7	NV	PERCENT	482497.05	1349426.97
	A6-FTF-20-2-R	20020612	0	1	Technetium-99	18	NV	pCi/g	482497.05	1349426.97
	A6-FTF-20-2-R	20020612	0	1	Thorium, Total	9.45	NV	mg/kg dry	482497.05	1349426.97
	A6-FTF-20-2-R	20020612	0	1	Uranium, Total	51.5	NV	mg/kg dry	482497.05	1349426.97
	A6-FTF-20-6-M	20020612	2	3	Arsenic	10.7	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-6-M	20020612	2	3	Beryllium	1.17	NV	mg/kg	482497.05	1349426.97
	A6-FTF-20-6-P	20020612	2	3	Aroclor-1254	42	UNV	ug/kg	482497.05	1349426.97
	A6-FTF-20-6-P	20020612	2	3	Aroclor-1260	3.1	NV	ug/kg	482497.05	1349426.97
	A6-FTF-20-6-R	20020612	2	3	Moisture Content	19	NV	PERCENT	482497.05	1349426.97
	A6-FTF-20-6-R	20020612	2	3	Technetium-99	11	NV	pCi/g	482497.05	1349426.97
	A6-FTF-20-6-R	20020612	2	3	Thorium, Total	9.57	NV	mg/kg dry	482497.05	1349426.97
	A6-FTF-20-6-R	20020612	2	3	Uranium, Total	37.3	NV	mg/kg dry	482497.05	1349426.97
A6-FTF-21	A6-FTF-21-10-L	20020614	4	5	1,1,1-Trichloroethane	540	UNV	ug/kg	482492.21	1349367.00
	A6-FTF-21-10-L	20020614	4	5	1,1,2-Trichloroethane	540	UNV	ug/kg	482492.21	1349367.00
	A6-FTF-21-10-L	20020614	4	5	Tetrachloroethene	450	UNV	ug/kg	482492.21	1349367.00
	A6-FTF-21-10-L	20020614	4	5	Toluene	1260000	UNV	ug/kg	482492.21	1349367.00
	A6-FTF-21-10-P	20020614	4	5	Aroclor-1254	43	U	ug/kg	482492.21	1349367.00

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Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-21-10-P	20020614	4	5	Aroclor-1260	2	J	ug/kg	482492.21	1349367.00
	A6-FTF-21-12-P	20020614	5	6	Aroclor-1254	1.6	J	ug/kg	482492.21	1349367.00
	A6-FTF-21-12-P	20020614	5	6	Aroclor-1260	41	U	ug/kg	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Cesium-137	.0239	UNV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Radium-226	TBD	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Technetium-99	7.5	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Thorium-228	1.25	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Thorium-230	7.94	UNV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Thorium-232	1.25	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-12-R	20020614	5	6	Uranium, Total	13	NV	mg/kg	482492.21	1349367.00
	A6-FTF-21-2-P	20020614	0	1	Aroclor-1254	40	U	ug/kg	482492.21	1349367.00
	A6-FTF-21-2-P	20020614	0	1	Aroclor-1260	40	U	ug/kg	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Cesium-137	.0597	UNV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Radium-226	TBD	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Technetium-99	2.61	UNV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Thorium-228	.867	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Thorium-230	20.2	UNV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Thorium-232	.603	NV	pCi/g	482492.21	1349367.00
	A6-FTF-21-2-R	20020614	0	1	Uranium, Total	4.46	NV	mg/kg	482492.21	1349367.00
A6-FTF-22	A6-FTF-22-12-P	20020614	5	6	Aroclor-1254	38	U	ug/kg	482505.22	1349349.54
	A6-FTF-22-12-P	20020614	5	6	Aroclor-1260	38	U	ug/kg	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Cesium-137	.0215	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Radium-226	TBD	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Technetium-99	2.95	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Thorium-228	.884	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Thorium-230	6.35	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Thorium-232	.862	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-12-R	20020614	5	6	Uranium, Total	11.6	NV	mg/kg	482505.22	1349349.54
	A6-FTF-22-4-P	20020614	1	2	Aroclor-1254	8	U	ug/kg	482505.22	1349349.54
	A6-FTF-22-4-P	20020614	1	2	Aroclor-1260	8	U	ug/kg	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Cesium-137	.0364	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Radium-226	TBD	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Technetium-99	2.6	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Thorium-228	.983	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Thorium-230	5.2	UNV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Thorium-232	.992	NV	pCi/g	482505.22	1349349.54
	A6-FTF-22-4-R	20020614	1	2	Uranium, Total	5.68	NV	mg/kg	482505.22	1349349.54

Note: Radium-226 results are not yet available

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APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-23	A6-FTF-23-12-M	20020613	5	6	Arsenic	6.47	NV	mg/kg	482546.61	1349355.44
	A6-FTF-23-12-M	20020613	5	6	Beryllium	.968	NV	mg/kg	482546.61	1349355.44
	A6-FTF-23-12-P	20020613	5	6	Aroclor-1254	38	UNV	ug/kg	482546.61	1349355.44
	A6-FTF-23-12-P	20020613	5	6	Aroclor-1260	38	UNV	ug/kg	482546.61	1349355.44
	A6-FTF-23-12-R	20020613	5	6	Moisture Content	13.2	NV	PERCENT	482546.61	1349355.44
	A6-FTF-23-12-R	20020613	5	6	Technetium-99	2.2	UNV	pCi/g	482546.61	1349355.44
	A6-FTF-23-12-R	20020613	5	6	Thorium, Total	6.85	NV	mg/kg dry	482546.61	1349355.44
	A6-FTF-23-12-R	20020613	5	6	Uranium, Total	2.36	NV	mg/kg dry	482546.61	1349355.44
	A6-FTF-23-2-M	20020613	0	1	Arsenic	3.2	NV	mg/kg	482546.61	1349355.44
	A6-FTF-23-2-M	20020613	0	1	Beryllium	.651	NV	mg/kg	482546.61	1349355.44
	A6-FTF-23-2-P	20020613	0	1	Aroclor-1254	44	NV	ug/kg	482546.61	1349355.44
	A6-FTF-23-2-P	20020613	0	1	Aroclor-1260	520	NV	ug/kg	482546.61	1349355.44
	A6-FTF-23-2-R	20020613	0	1	Moisture Content	5.6	NV	PERCENT	482546.61	1349355.44
	A6-FTF-23-2-R	20020613	0	1	Technetium-99	2.1	UNV	pCi/g	482546.61	1349355.44
	A6-FTF-23-2-R	20020613	0	1	Thorium, Total	1.55	NV	mg/kg dry	482546.61	1349355.44
	A6-FTF-23-2-R	20020613	0	1	Uranium, Total	3.19	NV	mg/kg dry	482546.61	1349355.44
A6-FTF-29	A6-FTF-29-12-R	20020602	5	6	Cesium-137	.0522	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Radium-226	TBD	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Technetium-99	2.39	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Thorium-228	1.2	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Thorium-230	8.29	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Thorium-232	1.17	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-12-R	20020602	5	6	Uranium, Total	4.55	NV	mg/kg	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Cesium-137	.038	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Technetium-99	1.73	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Thorium-228	1.16	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Thorium-230	11.5	UNV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Thorium-232	1.16	NV	pCi/g	482573.18	1349251.45
	A6-FTF-29-2-R	20020602	0	1	Uranium, Total	6.41	NV	mg/kg	482573.18	1349251.45
A6-FTF-30	A6-FTF-30-12-R	20020602	5	6	Cesium-137	.0377	UNV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Radium-226	TBD	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Technetium-99	1.51	UNV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Thorium-228	1.16	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Thorium-230	13	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Thorium-232	1.16	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-12-R	20020602	5	6	Uranium, Total	4.96	NV	mg/kg	482572.67	1349271.19

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Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-30-2-R	20020602	0	1	Cesium-137	.0433	UNV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Technetium-99	1.81	UNV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Thorium-228	1.13	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Thorium-230	11.9	UNV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Thorium-232	1.1	NV	pCi/g	482572.67	1349271.19
	A6-FTF-30-2-R	20020602	0	1	Uranium, Total	6.04	NV	mg/kg	482572.67	1349271.19
A6-FTF-31	A6-FTF-31-12-R	20020602	5	6	Cesium-137	.0452	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Radium-226	TBD	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Technetium-99	1.38	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Thorium-228	1.25	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Thorium-230	14.3	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Thorium-232	1.26	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-12-R	20020602	5	6	Uranium, Total	5.31	NV	mg/kg	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Cesium-137	.0474	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Technetium-99	1.92	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Thorium-228	1.18	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Thorium-230	6.04	UNV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Thorium-232	1.17	NV	pCi/g	482563.59	1349261.51
	A6-FTF-31-2-R	20020602	0	1	Uranium, Total	8.18	NV	mg/kg	482563.59	1349261.51

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-32	A6-FTF-32-12-R	20020613	5	6	Cesium-137	.0658	UNV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Radium-226	TBD	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Technetium-99	2.8	UNV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Thorium-228	1.03	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Thorium-230	23.1	UNV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Thorium-232	.686	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-12-R	20020613	5	6	Uranium, Total	3.7	UNV	mg/kg	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Cesium-137	.141	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Radium-226	TBD	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Technetium-99	2.61	UNV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Thorium-228	.753	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Thorium-230	12.2	UNV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Thorium-232	.506	NV	pCi/g	482552.68	1349271.87
	A6-FTF-32-2-R	20020613	0	1	Uranium, Total	4.11	NV	mg/kg	482552.68	1349271.87
A6-FTF-33	A6-FTF-33-12-R	20020613	5	6	Cesium-137	.0236	UNV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Radium-226	TBD	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Technetium-99	2.83	UNV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Thorium-228	1.34	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Thorium-230	6.25	UNV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Thorium-232	1.12	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-12-R	20020613	5	6	Uranium, Total	5.22	NV	mg/kg	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Cesium-137	.0292	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Radium-226	TBD	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Technetium-99	2.62	UNV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Thorium-228	.594	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Thorium-230	6.13	UNV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Thorium-232	.588	NV	pCi/g	482552.68	1349251.87
	A6-FTF-33-2-R	20020613	0	1	Uranium, Total	5.66	NV	mg/kg	482552.68	1349251.87
A6-FTF-34	A6-FTF-34-2-R	20020602	0	1	Cesium-137	.028	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Technetium-99	2.03	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Thorium-228	1.18	NV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Thorium-230	7.48	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Thorium-232	1.18	NV	pCi/g	482598.65	1349282.87
	A6-FTF-34-2-R	20020602	0	1	Uranium, Total	5.46	NV	mg/kg	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Cesium-137	.0398	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482598.65	1349282.87

Note: Radium-226 results are not yet available

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Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-34-8-R	20020602	3	4	Technetium-99	2.02	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Thorium-228	1.24	NV	pCi/g	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Thorium-230	11.4	UNV	pCi/g	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Thorium-232	1.23	NV	pCi/g	482598.65	1349282.87
	A6-FTF-34-8-R	20020602	3	4	Uranium, Total	5.28	NV	mg/kg	482598.65	1349282.87
A6-FTF-35	A6-FTF-35-2-L	20020617	0	1	1,1,1-Trichloroethane	430	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-L	20020617	0	1	1,1,2-Trichloroethane	430	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-L	20020617	0	1	Tetrachloroethene	360	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-L	20020617	0	1	Toluene	1000000	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-M	20020617	0	1	Arsenic	6.06	NV	mg/kg	482604.81	1349256.73
	A6-FTF-35-2-M	20020617	0	1	Beryllium	.905	NV	mg/kg	482604.81	1349256.73
	A6-FTF-35-2-P	20020617	0	1	Aroclor-1254	40	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-P	20020617	0	1	Aroclor-1260	40	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Cesium-137	.0515	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Radium-226	TBD	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Technetium-99	2.2	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Thorium-228	1.12	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Thorium-230	5.89	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Thorium-232	1.16	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-2-R	20020617	0	1	Uranium, Total	10.5	NV	mg/kg	482604.81	1349256.73
	A6-FTF-35-8-D	20020617	3	4	Heptachlorodibenzo-p-dioxins	80	U	ng/kg	482604.81	1349256.73
	A6-FTF-35-8-D	20020617	3	4	Octachlorodibenzo-p-dioxin	800	U	ng/kg	482604.81	1349256.73
	A6-FTF-35-8-L	20020617	3	4	1,1,1-Trichloroethane	430	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-L	20020617	3	4	1,1,2-Trichloroethane	430	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-L	20020617	3	4	Tetrachloroethene	360	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-L	20020617	3	4	Toluene	1000000	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-M	20020617	3	4	Arsenic	9.84	NV	mg/kg	482604.81	1349256.73
	A6-FTF-35-8-M	20020617	3	4	Beryllium	.956	NV	mg/kg	482604.81	1349256.73
	A6-FTF-35-8-P	20020617	3	4	Aroclor-1254	40	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-P	20020617	3	4	Aroclor-1260	40	UNV	ug/kg	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Cesium-137	.056	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Radium-226	TBD	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Technetium-99	2.28	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Thorium-228	1.22	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Thorium-230	17.9	UNV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Thorium-232	1.24	NV	pCi/g	482604.81	1349256.73
	A6-FTF-35-8-R	20020617	3	4	Uranium, Total	5.57	NV	mg/kg	482604.81	1349256.73

Note: Radium-226 results are not yet available

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APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-36	A6-FTF-36-2-R	20020602	0	1	Cesium-137	.0285	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Technetium-99	1.92	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Thorium-228	1.21	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Thorium-230	11.7	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Thorium-232	1.18	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-2-R	20020602	0	1	Uranium, Total	6.65	NV	mg/kg	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Cesium-137	.0362	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Technetium-99	2.55	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Thorium-228	1.25	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Thorium-230	11.3	UNV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Thorium-232	1.24	NV	pCi/g	482632.98	1349254.79
	A6-FTF-36-8-R	20020602	3	4	Uranium, Total	5.84	NV	mg/kg	482632.98	1349254.79
A6-FTF-37	A6-FTF-37-2-R	20020602	0	1	Cesium-137	.0267	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Technetium-99	1.87	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Thorium-228	1.25	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Thorium-230	11.8	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Thorium-232	1.23	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-2-R	20020602	0	1	Uranium, Total	5.47	NV	mg/kg	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Cesium-137	.0409	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Technetium-99	2.3	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Thorium-228	1.12	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Thorium-230	10.8	UNV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Thorium-232	1.12	NV	pCi/g	482653.64	1349255.17
	A6-FTF-37-8-R	20020602	3	4	Uranium, Total	3.78	NV	mg/kg	482653.64	1349255.17
A6-FTF-38	A6-FTF-38-2-R	20020602	0	1	Radium-226	TBD	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Technetium-99	1.63	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Thorium-228	.528	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Thorium-230	.685	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Thorium-232	.155	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Uranium, Total	1.61	NV	mg/kg	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Uranium-234	.794	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Uranium-235/236	.257	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-2-R	20020602	0	1	Uranium-238	.533	NV	pCi/g	482676.88	1349256.74

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Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-38-8-R	20020602	3	4	Cesium-137	.0384	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Technetium-99	2.54	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Thorium-228	1.05	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Thorium-230	11.2	UNV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Thorium-232	1.05	NV	pCi/g	482676.88	1349256.74
	A6-FTF-38-8-R	20020602	3	4	Uranium, Total	4.59	NV	mg/kg	482676.88	1349256.74
A6-FTF-39	A6-FTF-39-2-L	20020618	0	1	1,1,1-Trichloroethane	470	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-2-L	20020618	0	1	1,1,2-Trichloroethane	470	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-2-L	20020618	0	1	Tetrachloroethene	400	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-2-L	20020618	0	1	Toluene	1100000	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-8-D	20020618	3	4	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482700.63	1349258.87
	A6-FTF-39-8-D	20020618	3	4	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482700.63	1349258.87
	A6-FTF-39-8-L	20020618	3	4	1,1,1-Trichloroethane	540	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-8-L	20020618	3	4	1,1,2-Trichloroethane	540	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-8-L	20020618	3	4	Tetrachloroethene	460	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39-8-L	20020618	3	4	Toluene	1270000	UNV	ug/kg	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Cesium-137	.0331	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Radium-226	TBD	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Technetium-99	2.64	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Thorium-228	.703	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Thorium-230	11.7	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Thorium-232	.713	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-2-R	20020618	3	4	Uranium, Total	7.02	NV	mg/kg	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Cesium-137	.041	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Radium-226	TBD	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Technetium-99	2.27	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Thorium-228	1.11	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Thorium-230	13.2	UNV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Thorium-232	1.09	NV	pCi/g	482700.63	1349258.87
	A6-FTF-39A-8-R	20020618	3	4	Uranium, Total	9.06	NV	mg/kg	482700.63	1349258.87
A6-FTF-41	A6-FTF-41-2-R	20020602	0	1	Cesium-137	.0343	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482673.56	1349258.07
	A6-FTF-41-2-R	20020602	0	1	Technetium-99	1.51	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-2-R	20020602	0	1	Thorium-228	1.04	NV	pCi/g	482673.56	1349258.07
	A6-FTF-41-2-R	20020602	0	1	Thorium-230	10.2	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-2-R	20020602	0	1	Thorium-232	1.05	NV	pCi/g	482673.56	1349258.07

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-41-2-R	20020602	0	1	Uranium, Total	7.35	NV	mg/kg	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Cesium-137	.0389	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Technetium-99	1.32	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Thorium-228	1.27	NV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Thorium-230	11.4	UNV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Thorium-232	1.25	NV	pCi/g	482673.56	1349258.07
	A6-FTF-41-8-R	20020602	3	4	Uranium, Total	5.7	NV	mg/kg	482673.56	1349258.07
A6-FTF-42	A6-FTF-42-2-L	20020618	0	1	1,1,1-Trichloroethane	540	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-2-L	20020618	0	1	1,1,2-Trichloroethane	540	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-2-L	20020618	0	1	Tetrachloroethene	450	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-2-L	20020618	0	1	Toluene	1260000	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Cesium-137	.0345	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Radium-226	TBD	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Technetium-99	2.74	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Thorium-228	1.08	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Thorium-230	9.12	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Thorium-232	1.09	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-2-R	20020618	0	1	Uranium, Total	5.68	NV	mg/kg	482673.24	1349320.62
	A6-FTF-42-8-D	20020618	3	4	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482673.24	1349320.62
	A6-FTF-42-8-D	20020618	3	4	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482673.24	1349320.62
	A6-FTF-42-8-L	20020618	3	4	1,1,1-Trichloroethane	530	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-8-L	20020618	3	4	1,1,2-Trichloroethane	530	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-8-L	20020618	3	4	Tetrachloroethene	440	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-8-L	20020618	3	4	Toluene	1240000	UNV	ug/kg	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Cesium-137	.0523	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Radium-226	TBD	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Technetium-99	2.41	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Thorium-228	1.26	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Thorium-230	6.2	UNV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Thorium-232	1.25	NV	pCi/g	482673.24	1349320.62
	A6-FTF-42-8-R	20020618	3	4	Uranium, Total	2.83	NV	mg/kg	482673.24	1349320.62
A6-FTF-43	A6-FTF-43-2-R	20020602	0	1	Cesium-137	.0447	UNV	pCi/g	482628.93	1349317.03
	A6-FTF-43-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-2-R	20020602	0	1	Technetium-99	1.98	UNV	pCi/g	482628.93	1349317.03
	A6-FTF-43-2-R	20020602	0	1	Thorium-228	1.08	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-2-R	20020602	0	1	Thorium-230	6.15	UNV	pCi/g	482628.93	1349317.03

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-43-2-R	20020602	0	1	Thorium-232	1.09	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-2-R	20020602	0	1	Uranium, Total	4.14	NV	mg/kg	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Cesium-137	.0399	UNV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Technetium-99	1.79	UNV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Thorium-228	1.24	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Thorium-230	5.27	UNV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Thorium-232	1.23	NV	pCi/g	482628.93	1349317.03
	A6-FTF-43-8-R	20020602	3	4	Uranium, Total	3.54	NV	mg/kg	482628.93	1349317.03

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-44	A6-FTF-44-2-R	20020602	0	1	Cesium-137	.036	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Radium-226	TBD	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Technetium-99	1.51	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Thorium-228	1.23	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Thorium-230	10.6	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Thorium-232	1.21	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-2-R	20020602	0	1	Uranium, Total	4.48	NV	mg/kg	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Cesium-137	.0346	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Radium-226	TBD	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Technetium-99	2.08	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Thorium-228	1.38	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Thorium-230	10.6	UNV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Thorium-232	1.36	NV	pCi/g	482628.81	1349283.24
	A6-FTF-44-8-R	20020602	3	4	Uranium, Total	5.8	NV	mg/kg	482628.81	1349283.24
A6-FTF-45	A6-FTF-45-12-P	20020614	5	6	Aroclor-1254	37	U	ug/kg	482602.98	1349453.58
	A6-FTF-45-12-P	20020614	5	6	Aroclor-1260	37	U	ug/kg	482602.98	1349453.58
	A6-FTF-45-12-R	20020614	5	6	Moisture Content	13.3	NV	PERCENT	482602.98	1349453.58
	A6-FTF-45-12-R	20020614	5	6	Technetium-99	1.7	UNV	pCi/g	482602.98	1349453.58
	A6-FTF-45-12-R	20020614	5	6	Thorium, Total	7.14	NV	mg/kg dry	482602.98	1349453.58
	A6-FTF-45-12-R	20020614	5	6	Uranium, Total	3.13	NV	mg/kg dry	482602.98	1349453.58
	A6-FTF-45-2-P	20020614	0	1	Aroclor-1254	40	U	ug/kg	482602.98	1349453.58
	A6-FTF-45-2-P	20020614	0	1	Aroclor-1260	2	J	ug/kg	482602.98	1349453.58
	A6-FTF-45-2-R	20020614	0	1	Moisture Content	18.2	NV	PERCENT	482602.98	1349453.58
	A6-FTF-45-2-R	20020614	0	1	Technetium-99	1.8	UNV	pCi/g	482602.98	1349453.58
	A6-FTF-45-2-R	20020614	0	1	Thorium, Total	10.2	NV	mg/kg dry	482602.98	1349453.58
	A6-FTF-45-2-R	20020614	0	1	Uranium, Total	8.1	NV	mg/kg dry	482602.98	1349453.58
	A6-FTF-45-6-R	20020614	2	3	Moisture Content	20.5	NV	PERCENT	482602.98	1349453.58
	A6-FTF-45-6-R	20020614	2	3	Technetium-99	1.4	UNV	pCi/g	482602.98	1349453.58
	A6-FTF-45-6-R	20020614	2	3	Thorium, Total	10.7	NV	mg/kg dry	482602.98	1349453.58
	A6-FTF-45-6-R	20020614	2	3	Uranium, Total	3.64	NV	mg/kg dry	482602.98	1349453.58
A6-FTF-46	A6-FTF-46-2-L	20020618	0	1	1,1,1-Trichloroethane	510	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-2-L	20020618	0	1	1,1,2-Trichloroethane	510	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-2-L	20020618	0	1	Tetrachloroethene	.99	NV	ug/kg	482648.21	1349342.55
	A6-FTF-46-2-L	20020618	0	1	Toluene	.94	NV	ug/kg	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Cesium-137	.0474	UNV	pCi/g	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Radium-226	TBD	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Technetium-99	2.43	UNV	pCi/g	482648.21	1349342.55

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Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-46-2-R	20020618	0	1	Thorium-228	1.31	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Thorium-230	13.8	UNV	pCi/g	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Thorium-232	1.29	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-2-R	20020618	0	1	Uranium, Total	5.55	NV	mg/kg	482648.21	1349342.55
	A6-FTF-46-8-D	20020618	3	4	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482648.21	1349342.55
	A6-FTF-46-8-D	20020618	3	4	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482648.21	1349342.55
	A6-FTF-46-8-L	20020618	3	4	1,1,1-Trichloroethane	540	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-8-L	20020618	3	4	1,1,2-Trichloroethane	540	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-8-L	20020618	3	4	Tetrachloroethene	450	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-8-L	20020618	3	4	Toluene	1240000	UNV	ug/kg	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Cesium-137	.0354	UNV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Radium-226	TBD	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Technetium-99	2.5	UNV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Thorium-228	.658	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Thorium-230	12.3	UNV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Thorium-232	.665	NV	pCi/g	482648.21	1349342.55
	A6-FTF-46-8-R	20020618	3	4	Uranium, Total	4	NV	mg/kg	482648.21	1349342.55
A6-FTF-47	A6-FTF-47-2-L	20020617			1,1,1-Trichloroethane	430	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-L	20020617	0	1	1,1,2-Trichloroethane	430	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-L	20020617	0	1	Tetrachloroethene	360	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-L	20020617	0	1	Toluene	1000000	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-M	20020617	0	1	Arsenic	6.92	NV	mg/kg	482599.31	1349316.58
	A6-FTF-47-2-M	20020617	0	1	Beryllium	.943	NV	mg/kg	482599.31	1349316.58
	A6-FTF-47-2-P	20020617	0	1	Aroclor-1254	40	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-P	20020617	0	1	Aroclor-1260	40	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Cesium-137	.0382	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Radium-226	TBD	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Technetium-99	1.69	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Thorium-228	1.15	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Thorium-230	12.6	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Thorium-232	1.15	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-2-R	20020617	0	1	Uranium, Total	5.5	NV	mg/kg	482599.31	1349316.58
	A6-FTF-47-8-D	20020617	3	4	Heptachlorodibenzo-p-dioxins	80	U	ng/kg	482599.31	1349316.58
	A6-FTF-47-8-D	20020617	3	4	Octachlorodibenzo-p-dioxin	800	U	ng/kg	482599.31	1349316.58
	A6-FTF-47-8-L	20020617	3	4	1,1,1-Trichloroethane	430	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-8-L	20020617	3	4	1,1,2-Trichloroethane	430	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-8-L	20020617	3	4	Tetrachloroethene	360	UNV	ug/kg	482599.31	1349316.58

Note: Radium-226 results are not yet available

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APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-47-8-L	20020617	3	4	Toluene	1000000	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-8-M	20020617	3	4	Arsenic	20	NV	mg/kg	482599.31	1349316.58
	A6-FTF-47-8-M	20020617	3	4	Beryllium	1.01	NV	mg/kg	482599.31	1349316.58
	A6-FTF-47-8-P	20020617	3	4	Aroclor-1254	1.9	NV	ug/kg	482599.31	1349316.58
	A6-FTF-47-8-P	20020617	3	4	Aroclor-1260	41	UNV	ug/kg	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	3	Cesium-137	.0568	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Radium-226	TBD	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Technetium-99	2.03	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Thorium-228	1.21	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Thorium-230	7.81	UNV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Thorium-232	1.23	NV	pCi/g	482599.31	1349316.58
	A6-FTF-47-8-R	20020617	3	4	Uranium, Total	6.16	NV	mg/kg	482599.31	1349316.58
A6-FTF-48	A6-FTF-48-2-R	20020610	3	4	Moisture Content	11.1	NV	PERCENT	482549.05	1349371.45
	A6-FTF-48-2-R	20020610	3	4	Technetium-99	3.2	NV	pCi/g	482549.05	1349371.45
	A6-FTF-48-2-R	20020610	3	4	Thorium, Total	5.5	NV	mg/kg dry	482549.05	1349371.45
	A6-FTF-48-2-R	20020610	3	4	Uranium, Total	19.9	NV	mg/kg dry	482549.05	1349371.45
	A6-FTF-48-22-R	20020610	10	11	Moisture Content	12	NV	PERCENT	482549.05	1349371.45
	A6-FTF-48-22-R	20020610	10	11	Technetium-99	1.8	UNV	pCi/g	482549.05	1349371.45
	A6-FTF-48-22-R	20020610	10	11	Thorium, Total	4.32	NV	mg/kg dry	482549.05	1349371.45
	A6-FTF-48-22-R	20020610	10	11	Uranium, Total	1.06	NV	mg/kg dry	482549.05	1349371.45
	A6-FTF-48-28-R	20020610	13	14	Moisture Content	10.5	NV	PERCENT	482549.05	1349371.45
	A6-FTF-48-28-R	20020610	13	14	Technetium-99	1.6	UNV	pCi/g	482549.05	1349371.45
	A6-FTF-48-28-R	20020610	13	14	Thorium, Total	4.3	NV	mg/kg dry	482549.05	1349371.45
	A6-FTF-48-28-R	20020610	13	14	Uranium, Total	1.57	NV	mg/kg dry	482549.05	1349371.45
A6-FTF-49	A6-FTF-49-2-R	20020610	0	1	Moisture Content	10.3	NV	PERCENT	482542.39	1349378.44
	A6-FTF-49-2-R	20020610	0	1	Technetium-99	2.1	NV	pCi/g	482542.39	1349378.44
	A6-FTF-49-2-R	20020610	0	1	Thorium, Total	5.49	NV	mg/kg dry	482542.39	1349378.44
	A6-FTF-49-2-R	20020610	0	1	Uranium, Total	18.4	NV	mg/kg dry	482542.39	1349378.44
	A6-FTF-49-22-R	20020610	10	11	Moisture Content	12.4	NV	PERCENT	482542.39	1349378.44
	A6-FTF-49-22-R	20020610	10	11	Technetium-99	1.7	UNV	pCi/g	482542.39	1349378.44
	A6-FTF-49-22-R	20020610	10	11	Thorium, Total	4.44	NV	mg/kg dry	482542.39	1349378.44
	A6-FTF-49-22-R	20020610	10	11	Uranium, Total	1.19	NV	mg/kg dry	482542.39	1349378.44
	A6-FTF-49-28-R	20020610	13	14	Moisture Content	10.1	NV	PERCENT	482542.39	1349378.44
	A6-FTF-49-28-R	20020610	13	14	Technetium-99	1.8	UNV	pCi/g	482542.39	1349378.44
	A6-FTF-49-28-R	20020610	13	14	Thorium, Total	3.94	NV	mg/kg dry	482542.39	1349378.44
	A6-FTF-49-28-R	20020610	13	14	Uranium, Total	2.03	NV	mg/kg dry	482542.39	1349378.44
A6-FTF-50	A6-FTF-50-2-R	20020611	0	1	Moisture Content	9	NV	PERCENT	482542.01	1349364.07

000280

-4439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-50-2-R	20020611	0	1	Technetium-99	1.8	UNV	pCi/g	482542.01	1349364.07
	A6-FTF-50-2-R	20020611	0	1	Thorium, Total	5.01	NV	mg/kg dry	482542.01	1349364.07
	A6-FTF-50-2-R	20020611	0	1	Uranium, Total	23.4	NV	mg/kg dry	482542.01	1349364.07
	A6-FTF-50-22-R	20020611	10	11	Moisture Content	12.3	NV	PERCENT	482542.01	1349364.07
	A6-FTF-50-22-R	20020611	10	11	Technetium-99	1.8	UNV	pCi/g	482542.01	1349364.07
	A6-FTF-50-22-R	20020611	10	11	Thorium, Total	5.44	NV	mg/kg dry	482542.01	1349364.07
	A6-FTF-50-22-R	20020611	10	11	Uranium, Total	1.25	NV	mg/kg dry	482542.01	1349364.07
	A6-FTF-50-28-R	20020611	13	14	Moisture Content	11.2	NV	PERCENT	482542.01	1349364.07
	A6-FTF-50-28-R	20020611	13	14	Technetium-99	1.7	UNV	pCi/g	482542.01	1349364.07
	A6-FTF-50-28-R	20020611	13	14	Thorium, Total	4.66	NV	mg/kg dry	482542.01	1349364.07
	A6-FTF-50-28-R	20020611	13	14	Uranium, Total	1.58	NV	mg/kg dry	482542.01	1349364.07
A6-FTF-51	A6-FTF-51-2-R	20020610	0	1	Moisture Content	10.4	NV	PERCENT	482556.16	1349363.93
	A6-FTF-51-2-R	20020610	0	1	Technetium-99	2	NV	pCi/g	482556.16	1349363.93
	A6-FTF-51-2-R	20020610	0	1	Thorium, Total	4.89	NV	mg/kg dry	482556.16	1349363.93
	A6-FTF-51-2-R	20020610	0	1	Uranium, Total	24.4	NV	mg/kg dry	482556.16	1349363.93
	A6-FTF-51-22-R	20020610	10	11	Moisture Content	11.8	NV	PERCENT	482556.16	1349363.93
	A6-FTF-51-22-R	20020610	10	11	Technetium-99	4.6	NV	pCi/g	482556.16	1349363.93
	A6-FTF-51-22-R	20020610	10	11	Thorium, Total	3.63	NV	mg/kg dry	482556.16	1349363.93
	A6-FTF-51-22-R	20020610	10	11	Uranium, Total	1.36	NV	mg/kg dry	482556.16	1349363.93
	A6-FTF-51-28-R	20020610	13	14	Moisture Content	11.3	NV	PERCENT	482556.16	1349363.93
	A6-FTF-51-28-R	20020610	13	14	Technetium-99	1.7	UNV	pCi/L	482556.16	1349363.93
	A6-FTF-51-28-R	20020610	13	14	Thorium, Total	3.17	NV	mg/kg dry	482556.16	1349363.93
	A6-FTF-51-28-R	20020610	13	14	Uranium, Total	1.18	NV	mg/kg dry	482556.16	1349363.93
A6-FTF-52	A6-FTF-52-2-R	20020609	0	1	Moisture Content	9.9	NV	PERCENT	482555.90	1349378.09
	A6-FTF-52-2-R	20020609	0	1	Technetium-99	1.8	UNV	pCi/g	482555.90	1349378.09
	A6-FTF-52-2-R	20020609	0	1	Thorium, Total	4.27	NV	mg/kg dry	482555.90	1349378.09
	A6-FTF-52-2-R	20020609	0	1	Uranium, Total	12.5	NV	mg/kg dry	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	1,1-Dichloroethene	6700	NV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	1,1-Dichloroethene	8300	NV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	Bromodichloromethane	2250000	UNV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	Bromodichloromethane	45000	UNV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	Tetrachloroethene	207000	NV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-L	20020609	10	11	Tetrachloroethene	271000	NV	ug/kg	482555.90	1349378.09
	A6-FTF-52-22-R	20020609	10	11	Moisture Content	10.1	NV	PERCENT	482555.90	1349378.09
	A6-FTF-52-22-R	20020609	10	11	Technetium-99	1.6	UNV	pCi/g	482555.90	1349378.09
	A6-FTF-52-22-R	20020609	10	11	Thorium, Total	3.59	NV	mg/kg dry	482555.90	1349378.09
	A6-FTF-52-22-R	20020609	10	11	Uranium, Total	2.08	NV	mg/kg dry	482555.90	1349378.09

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-52-28-R	20020609	13	14	Moisture Content	10	NV	PERCENT	482555.90	1349378.09
	A6-FTF-52-28-R	20020609	13	14	Technetium-99	1.7	UNV	pCi/g	482555.90	1349378.09
	A6-FTF-52-28-R	20020609	13	14	Thorium, Total	4.29	NV	mg/kg dry	482555.90	1349378.09
	A6-FTF-52-28-R	20020609	13	14	Uranium, Total	1.3	NV	mg/kg dry	482555.90	1349378.09
A6-FTF-53	A6-FTF-53-10-L	20020618	4	5	1,1,1-Trichloroethane	110	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-10-L	20020618	4	5	1,1,2-Trichloroethane	510	UNV	ug/kg	482570.00	1349383.00
	A6-FTF-53-10-L	20020618	4	5	Tetrachloroethene	250	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-10-L	20020618	4	5	Toluene	3.8	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-10-TL	20020618	4	5	Tetrachloroethene	508	NV	ug/L	482570.00	1349383.00
	A6-FTF-53-18-L	20020618	8	9	1,1,1-Trichloroethane	210	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-18-L	20020618	8	9	1,1,2-Trichloroethane	500	UNV	ug/kg	482570.00	1349383.00
	A6-FTF-53-18-L	20020618	8	9	Tetrachloroethene	140	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-18-L	20020618	8	9	Toluene	1.3	NV	ug/kg	482570.00	1349383.00
	A6-FTF-53-18-R	20020618	8	9	Moisture Content	12.6	NV	PERCENT	482570.00	1349383.00
	A6-FTF-53-18-R	20020618	8	9	Technetium-99	1.8	UNV	pCi/g	482570.00	1349383.00
	A6-FTF-53-18-R	20020618	8	9	Thorium, Total	7.34	NV	mg/kg dry	482570.00	1349383.00
	A6-FTF-53-18-R	20020618	8	9	Uranium, Total	3.95	NV	mg/kg dry	482570.00	1349383.00
	A6-FTF-53-18-TL	20020618	8	9	Tetrachloroethene	28.7	NV	ug/L	482570.00	1349383.00
	A6-FTF-53A-10-R	20020618	4	5	Moisture Content	16.7	NV	PERCENT	482570.00	1349383.00
	A6-FTF-53A-10-R	20020618	4	5	Technetium-99	22	NV	pCi/g	482570.00	1349383.00
	A6-FTF-53A-10-R	20020618	4	5	Thorium, Total	9.16	NV	mg/kg dry	482570.00	1349383.00
	A6-FTF-53A-10-R	20020618	4	5	Uranium, Total	81.5	NV	mg/kg dry	482570.00	1349383.00
A6-FTF-54	A6-FTF-54-14-R	20020609	6	7	Moisture Content	19.2	NV	PERCENT	482592.95	1349412.37
	A6-FTF-54-14-R	20020609	6	7	Technetium-99	1.6	UNV	pCi/g	482592.95	1349412.37
	A6-FTF-54-14-R	20020609	6	7	Thorium, Total	7.59	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-14-R	20020609	6	7	Uranium, Total	3.67	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-2-R	20020609	0	1	Moisture Content	13.1	NV	PERCENT	482592.95	1349412.37
	A6-FTF-54-2-R	20020609	0	1	Technetium-99	2.3	NV	pCi/g	482592.95	1349412.37
	A6-FTF-54-2-R	20020609	0	1	Thorium, Total	4.53	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-2-R	20020609	0	1	Uranium, Total	13.2	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-22-R	20020609	10	11	Moisture Content	12.9	NV	PERCENT	482592.95	1349412.37
	A6-FTF-54-22-R	20020609	10	11	Technetium-99	1.7	UNV	pCi/g	482592.95	1349412.37
	A6-FTF-54-22-R	20020609	10	11	Thorium, Total	5.62	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-22-R	20020609	10	11	Uranium, Total	1.63	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-28-R	20020609	13	14	Moisture Content	13.9	NV	PERCENT	482592.95	1349412.37
	A6-FTF-54-28-R	20020609	13	14	Technetium-99	1.6	UNV	pCi/g	482592.95	1349412.37
	A6-FTF-54-28-R	20020609	13	14	Thorium, Total	.984	NV	mg/kg dry	482592.95	1349412.37

Note: Radium-226 results are not yet available

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4439

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-54-28-R	20020609	13	14	Uranium, Total	.517	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-6-R	20020609	2	3	Moisture Content	20.2	NV	PERCENT	482592.95	1349412.37
	A6-FTF-54-6-R	20020609	2	3	Technetium-99	1.9	UNV	pCi/g	482592.95	1349412.37
	A6-FTF-54-6-R	20020609	2	3	Thorium, Total	9.41	NV	mg/kg dry	482592.95	1349412.37
	A6-FTF-54-6-R	20020609	2	3	Uranium, Total	3.11	NV	mg/kg dry	482592.95	1349412.37
A6-FTF-55	A6-FTF-55-2-R	20020527	0	1	Moisture Content	9.9	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55-2-R	20020527	0	1	Technetium-99	2	UNV	pCi/g	482585.71	1349405.64
	A6-FTF-55-2-R	20020527	0	1	Thorium, Total	7.04	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55-2-R	20020527	0	1	Uranium, Total	18.3	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55-4B-R	20020527	1	2	Moisture Content	16.7	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55-4B-R	20020527	1	2	Technetium-99	210	NV	pCi/g	482585.71	1349405.64
	A6-FTF-55-4B-R	20020527	1	2	Thorium, Total	8.31	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55-4B-R	20020527	1	2	Uranium, Total	446	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55-6-R	20020527	2	3	Moisture Content	18.9	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55-6-R	20020527	2	3	Technetium-99	13	NV	pCi/g	482585.71	1349405.64
	A6-FTF-55-6-R	20020527	2	3	Thorium, Total	9.11	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55-6-R	20020527	2	3	Uranium, Total	10.2	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-14-R	20020529	13	14	Moisture Content	13.3	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55A-14-R	20020529	13	14	Technetium-99	1.7	UNV	pCi/g	482585.71	1349405.64
	A6-FTF-55A-14-R	20020529	13	14	Thorium, Total	5.42	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-14-R	20020529	13	14	Uranium, Total	1.54	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-22-R	20020529	10	11	Moisture Content	12.5	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55A-22-R	20020529	10	11	Technetium-99	1.8	UNV	pCi/g	482585.71	1349405.64
	A6-FTF-55A-22-R	20020529	10	11	Thorium, Total	5.28	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-22-R	20020529	10	11	Uranium, Total	1.37	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-28-R	20020529	13	14	Moisture Content	10.6	NV	PERCENT	482585.71	1349405.64
	A6-FTF-55A-28-R	20020529	13	14	Technetium-99	1.7	UNV	pCi/g	482585.71	1349405.64
	A6-FTF-55A-28-R	20020529	13	14	Thorium, Total	4.5	NV	mg/kg dry	482585.71	1349405.64
	A6-FTF-55A-28-R	20020529	13	14	Uranium, Total	1.5	NV	mg/kg dry	482585.71	1349405.64
A6-FTF-56	A6-FTF-56-14-R	20020609	6	7	Moisture Content	14.8	NV	PERCENT	482586.06	1349419.26
	A6-FTF-56-14-R	20020609	6	7	Technetium-99	1.6	UNV	pCi/g	482586.06	1349419.26
	A6-FTF-56-14-R	20020609	6	7	Thorium, Total	5.07	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-14-R	20020609	6	7	Uranium, Total	1.28	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-2-R	20020609	0	1	Moisture Content	12.5	NV	PERCENT	482586.06	1349419.26
	A6-FTF-56-2-R	20020609	0	1	Technetium-99	3.1	NV	pCi/g	482586.06	1349419.26
	A6-FTF-56-2-R	20020609	0	1	Thorium, Total	5.91	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-2-R	20020609	0	1	Uranium, Total	5.83	NV	mg/kg dry	482586.06	1349419.26

000283

14439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-56-22-R	20020609	10	11	Moisture Content	11.1	NV	PERCENT	482586.06	1349419.26
	A6-FTF-56-22-R	20020609	10	11	Technetium-99	1.8	UNV	pCi/g	482586.06	1349419.26
	A6-FTF-56-22-R	20020609	10	11	Thorium, Total	4.78	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-22-R	20020609	10	11	Uranium, Total	1.19	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-28-R	20020609	13	14	Moisture Content	10.1	NV	PERCENT	482586.06	1349419.26
	A6-FTF-56-28-R	20020609	13	14	Technetium-99	1.7	UNV	pCi/g	482586.06	1349419.26
	A6-FTF-56-28-R	20020609	13	14	Thorium, Total	4.3	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-28-R	20020609	13	14	Uranium, Total	1.54	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-6-R	20020609	2	3	Moisture Content	19	NV	PERCENT	482586.06	1349419.26
	A6-FTF-56-6-R	20020609	2	3	Technetium-99	1.6	UNV	pCi/g	482586.06	1349419.26
	A6-FTF-56-6-R	20020609	2	3	Thorium, Total	8.29	NV	mg/kg dry	482586.06	1349419.26
	A6-FTF-56-6-R	20020609	2	3	Uranium, Total	3.08	NV	mg/kg dry	482586.06	1349419.26
A6-FTF-57	A6-FTF-57-14-R	20020609	6	7	Moisture Content	12.3	NV	PERCENT	482599.88	1349419.14
	A6-FTF-57-14-R	20020609	6	7	Technetium-99	1.5	UNV	pCi/g	482599.88	1349419.14
	A6-FTF-57-14-R	20020609	6	7	Thorium, Total	6.49	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-14-R	20020609	6	7	Uranium, Total	1.53	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-2-R	20020609	0	1	Moisture Content	13.7	NV	PERCENT	482599.88	1349419.14
	A6-FTF-57-2-R	20020609	0	1	Technetium-99	1.8	UNV	pCi/g	482599.88	1349419.14
	A6-FTF-57-2-R	20020609	0	1	Thorium, Total	6.73	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-2-R	20020609	0	1	Uranium, Total	18.4	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-22-R	20020609	10	11	Moisture Content	11.6	NV	PERCENT	482599.88	1349419.14
	A6-FTF-57-22-R	20020609	10	11	Technetium-99	1.6	UNV	pCi/g	482599.88	1349419.14
	A6-FTF-57-22-R	20020609	10	11	Thorium, Total	5.9	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-22-R	20020609	10	11	Uranium, Total	1.49	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-28-R	20020609	13	14	Moisture Content	10.8	NV	PERCENT	482599.88	1349419.14
	A6-FTF-57-28-R	20020609	13	14	Technetium-99	1.8	UNV	pCi/g	482599.88	1349419.14
	A6-FTF-57-28-R	20020609	13	14	Thorium, Total	5.38	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-28-R	20020609	13	14	Uranium, Total	2.35	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-6-R	20020609	2	3	Moisture Content	19.5	NV	PERCENT	482599.88	1349419.14
	A6-FTF-57-6-R	20020609	2	3	Technetium-99	1.8	UNV	pCi/g	482599.88	1349419.14
	A6-FTF-57-6-R	20020609	2	3	Thorium, Total	9.63	NV	mg/kg dry	482599.88	1349419.14
	A6-FTF-57-6-R	20020609	2	3	Uranium, Total	2.54	NV	mg/kg dry	482599.88	1349419.14
A6-FTF-58	A6-FTF-58-12-P	20020613	5	6	Aroclor-1254	3.3	NV	ug/kg	482600.00	1349405.58
	A6-FTF-58-12-P	20020613	5	6	Aroclor-1260	2.7	NV	ug/kg	482600.00	1349405.58
	A6-FTF-58-14-R	20020613	6	7	Moisture Content	12.3	NV	PERCENT	482600.00	1349405.58
	A6-FTF-58-14-R	20020613	6	7	Technetium-99	2.1	UNV	pCi/g	482600.00	1349405.58
	A6-FTF-58-14-R	20020613	6	7	Thorium, Total	5.79	NV	mg/kg dry	482600.00	1349405.58

000284

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Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-58-14-R	20020613	6	7	Uranium, Total	1.82	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-2-P	20020613	0	1	Aroclor-1254	180	UNV	ug/kg	482600.00	1349405.58
	A6-FTF-58-2-P	20020613	0	1	Aroclor-1260	120	NV	ug/kg	482600.00	1349405.58
	A6-FTF-58-2-R	20020613	0	1	Moisture Content	13.2	NV	PERCENT	482600.00	1349405.58
	A6-FTF-58-2-R	20020613	0	1	Technetium-99	4.4	NV	pCi/g	482600.00	1349405.58
	A6-FTF-58-2-R	20020613	0	1	Thorium, Total	6.98	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-2-R	20020613	0	1	Uranium, Total	39.1	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-22-R	20020613	10	11	Moisture Content	11.1	NV	PERCENT	482600.00	1349405.58
	A6-FTF-58-22-R	20020613	10	11	Technetium-99	1.7	UNV	pCi/g	482600.00	1349405.58
	A6-FTF-58-22-R	20020613	10	11	Thorium, Total	5.76	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-22-R	20020613	10	11	Uranium, Total	1.58	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-28-R	20020613	13	14	Moisture Content	10.2	NV	PERCENT	482600.00	1349405.58
	A6-FTF-58-28-R	20020613	13	14	Technetium-99	2.1	UNV	pCi/g	482600.00	1349405.58
	A6-FTF-58-28-R	20020613	13	14	Thorium, Total	5.4	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-28-R	20020613	13	14	Uranium, Total	1.81	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-6-R	20020613	2	3	Moisture Content	20.4	NV	PERCENT	482600.00	1349405.58
	A6-FTF-58-6-R	20020613	2	3	Technetium-99	5.7	NV	pCi/g	482600.00	1349405.58
	A6-FTF-58-6-R	20020613	2	3	Thorium, Total	9.96	NV	mg/kg dry	482600.00	1349405.58
	A6-FTF-58-6-R	20020613	2	3	Uranium, Total	8.02	NV	mg/kg dry	482600.00	1349405.58
A6-FTF-59	A6-FTF-59-10-L	20020614	4	5	1,1,1-Trichloroethane	500	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-L	20020614	4	5	1,1,2-Trichloroethane	500	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-L	20020614	4	5	Tetrachloroethene	420	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-L	20020614	4	5	Toluene	1160000	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-M	20020614	4	5	Arsenic	3.52	J	mg/kg	482578.10	1349393.56
	A6-FTF-59-10-M	20020614	4	5	Beryllium	.635	J	mg/kg	482578.10	1349393.56
	A6-FTF-59-10-P	20020614	4	5	Aroclor-1254	7	J	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-P	20020614	4	5	Aroclor-1260	38	U	ug/kg	482578.10	1349393.56
	A6-FTF-59-10-R	20020614	4	5	Moisture Content	14.2	NV	PERCENT	482578.10	1349393.56
	A6-FTF-59-10-R	20020614	4	5	Technetium-99	1.8	UNV	pCi/g	482578.10	1349393.56
	A6-FTF-59-10-R	20020614	4	5	Thorium, Total	7.79	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-10-R	20020614	4	5	Uranium, Total	7.84	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-18-L	20020614	4	5	1,1,1-Trichloroethane	480	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-L	20020614	8	9	1,1,2-Trichloroethane	480	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-L	20020614	8	9	Tetrachloroethene	400	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-L	20020614	8	9	Toluene	1120000	UNV	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-M	20020614	8	9	Arsenic	4.81	-	mg/kg	482578.10	1349393.56
	A6-FTF-59-18-M	20020614	8	9	Beryllium	1.07	-	mg/kg	482578.10	1349393.56

Note: Radium-226 results are not yet available

000285
4439

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-59-18-P	20020614	8	9	Aroclor-1254	37	U	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-P	20020614	9	9	Aroclor-1260	37	U	ug/kg	482578.10	1349393.56
	A6-FTF-59-18-R	20020614	8	9	Moisture Content	11.1	NV	PERCENT	482578.10	1349393.56
	A6-FTF-59-18-R	20020614	8	9	Technetium-99	1.7	UNV	pCi/g	482578.10	1349393.56
	A6-FTF-59-18-R	20020614	8	9	Thorium, Total	7.7	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-18-R	20020614	8	9	Uranium, Total	2.94	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-2-R	20020614	0	1	Technetium-99	1.96	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-4-R	20020614	1	2	Technetium-99	0.101	NV	mg/kg dry	482578.10	1349393.56
	A6-FTF-59-6-R	20020614	2	3	Technetium-99	9.42	NV	mg/kg dry	482578.10	1349393.56
A6-FTF-60	A6-FTF-60-12-M	20020614	5	6	Arsenic	4.94	-	mg/kg	482569.13	1349468.18
	A6-FTF-60-12-M	20020614	5	6	Beryllium	.739	J	mg/kg	482569.13	1349468.18
	A6-FTF-60-12-P	20020614	5	6	Aroclor-1254	13	J	ug/kg	482569.13	1349468.18
	A6-FTF-60-12-P	20020614	5	6	Aroclor-1260	44	-	ug/kg	482569.13	1349468.18
	A6-FTF-60-12-R	20020614	5	6	Moisture Content	13.1	NV	PERCENT	482569.13	1349468.18
	A6-FTF-60-12-R	20020614	5	6	Technetium-99	1.7	UNV	pCi/g	482569.13	1349468.18
	A6-FTF-60-12-R	20020614	5	6	Thorium, Total	7.94	NV	mg/kg dry	482569.13	1349468.18
	A6-FTF-60-12-R	20020614	5	6	Uranium, Total	4.18	NV	mg/kg dry	482569.13	1349468.18
	A6-FTF-60-18-M	20020614	8	9	Arsenic	5.57	-	mg/kg	482569.13	1349468.18
	A6-FTF-60-18-M	20020614	8	9	Beryllium	.524	J	mg/kg	482569.13	1349468.18
	A6-FTF-60-18-P	20020614	8	9	Aroclor-1254	38	U	ug/kg	482569.13	1349468.18
	A6-FTF-60-18-P	20020614	8	9	Aroclor-1260	38	U	ug/kg	482569.13	1349468.18
	A6-FTF-60-18-R	20020614	8	9	Moisture Content	11.8	NV	PERCENT	482569.13	1349468.18
	A6-FTF-60-18-R	20020614	8	9	Technetium-99	1.7	UNV	pCi/g	482569.13	1349468.18
	A6-FTF-60-18-R	20020614	8	9	Thorium, Total	7.36	NV	mg/kg dry	482569.13	1349468.18
	A6-FTF-60-18-R	20020614	8	9	Uranium, Total	3.17	NV	mg/kg dry	482569.13	1349468.18
	A6-FTF-60-6-R	20020614	2	3	Moisture Content	12.2	NV	PERCENT	482569.13	1349468.18
	A6-FTF-60-6-R	20020614	2	3	Technetium-99	1.8	UNV	pCi/g	482569.13	1349468.18
	A6-FTF-60-6-R	20020614	2	3	Thorium, Total	7.68	NV	mg/kg dry	482569.13	1349468.18
	A6-FTF-60-6-R	20020614	2	3	Uranium, Total	26.5	NV	mg/kg dry	482569.13	1349468.18
A6-FTF-61	A6-FTF-61-18-M	20020614	8	9	Arsenic	5.85	-	mg/kg	482569.45	1349486.78
	A6-FTF-61-18-M	20020614	8	9	Beryllium	.597	J	mg/kg	482569.45	1349486.78
	A6-FTF-61-18-P	20020614	8	9	Aroclor-1254	37	U	ug/kg	482569.45	1349486.78
	A6-FTF-61-18-P	20020614	8	9	Aroclor-1260	37	U	ug/kg	482569.45	1349486.78
	A6-FTF-61-18-R	20020614	8	9	Moisture Content	11.7	NV	PERCENT	482569.45	1349486.78
	A6-FTF-61-18-R	20020614	8	9	Technetium-99	1.8	UNV	pCi/g	482569.45	1349486.78
	A6-FTF-61-18-R	20020614	8	9	Thorium, Total	6.74	NV	mg/kg dry	482569.45	1349486.78
	A6-FTF-61-18-R	20020614	8	9	Uranium, Total	3.11	NV	mg/kg dry	482569.45	1349486.78

Note: Radium-226 results are not yet available

000286
4439

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
A6-FTF-62	A6-FTF-62-12-L	20020616	5	6	1,1,1-Trichloroethane	550	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-L	20020616	5	6	1,1,2-Trichloroethane	550	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-L	20020616	5	6	Tetrachloroethene	460	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-L	20020616	5	6	Toluene	1270000	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-M	20020616	5	6	Arsenic	7.87	-	mg/kg	482684.33	1349421.08
	A6-FTF-62-12-M	20020616	5	6	Beryllium	1.12	-	mg/kg	482684.33	1349421.08
	A6-FTF-62-12-P	20020616	5	6	Aroclor-1254	42	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-P	20020616	5	6	Aroclor-1260	42	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Cesium-137	.0412	UNV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Technetium-99	1.73	UNV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Thorium-228	1.28	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Thorium-230	12	UNV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Thorium-232	1.26	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-12-R	20020616	5	6	Uranium, Total	6.27	NV	mg/kg	482684.33	1349421.08
	A6-FTF-62-2-L	20020616	0	1	1,1,1-Trichloroethane	510	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-L	20020616	0	1	1,1,2-Trichloroethane	510	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-L	20020616	0	1	Tetrachloroethene	430	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-L	20020616	0	1	Toluene	1190000	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-M	20020616	0	1	Arsenic	6.61	-	mg/kg	482684.33	1349421.08
	A6-FTF-62-2-M	20020616	0	1	Beryllium	.4	J	mg/kg	482684.33	1349421.08
	A6-FTF-62-2-P	20020616	0	1	Aroclor-1254	38	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-P	20020616	0	1	Aroclor-1260	38	UNV	ug/kg	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Cesium-137	.116	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Technetium-99	1.97	UNV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Thorium-228	.756	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Thorium-230	8.44	UNV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Thorium-232	.745	NV	pCi/g	482684.33	1349421.08
	A6-FTF-62-2-R	20020616	0	1	Uranium, Total	9.41	NV	mg/kg	482684.33	1349421.08
A6-FTF-63	A6-FTF-63-12-L	20020616	5	6	1,1,1-Trichloroethane	510	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-12-L	20020616	5	6	1,1,2-Trichloroethane	510	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-12-L	20020616	5	6	Tetrachloroethene	420	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-12-L	20020616	5	6	Toluene	1180000	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-12-M	20020616	5	6	Arsenic	6.05	-	mg/kg	482674.34	1349484.24
	A6-FTF-63-12-M	20020616	5	6	Beryllium	.787	J	mg/kg	482674.34	1349484.24
	A6-FTF-63-12-P	20020616	5	6	Aroclor-1254	40	UNV	ug/kg	482674.34	1349484.24

000287

4439

Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-63-12-P	20020616	5	6	Aroclor-1260	40	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Cesium-137	.0307	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Technetium-99	1.84	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Thorium-228	.91	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Thorium-230	9.7	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Thorium-232	.899	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-12-R	20020616	5	6	Uranium, Total	3.62	NV	mg/kg	482674.34	1349484.24
	A6-FTF-63-2-L	20020616	0	1	1,1,1-Trichloroethane	510	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-L	20020616	0	1	1,1,2-Trichloroethane	510	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-L	20020616	0	1	Tetrachloroethene	430	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-L	20020616	0	1	Toluene	1200000	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-M	20020616	0	1	Arsenic	7.2	-	mg/kg	482674.34	1349484.24
	A6-FTF-63-2-M	20020616	0	1	Beryllium	.757	J	mg/kg	482674.34	1349484.24
	A6-FTF-63-2-P	20020616	0	1	Aroclor-1254	35	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-P	20020616	0	1	Aroclor-1260	35	UNV	ug/kg	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Cesium-137	.0296	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Technetium-99	1.7	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Thorium-228	.781	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Thorium-230	8.09	UNV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Thorium-232	.772	NV	pCi/g	482674.34	1349484.24
	A6-FTF-63-2-R	20020616	0	1	Uranium, Total	6.81	NV	mg/kg	482674.34	1349484.24
A6-FTF-64	A6-FTF-64-12-L	20020616	5	6	1,1,1-Trichloroethane	550	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-L	20020616	5	6	1,1,2-Trichloroethane	550	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-L	20020616	5	6	Tetrachloroethene	460	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-L	20020616	5	6	Toluene	1270000	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-M	20020616	5	6	Arsenic	8.83	-	mg/kg	482638.18	1349387.98
	A6-FTF-64-12-M	20020616	5	6	Beryllium	.841	J	mg/kg	482638.18	1349387.98
	A6-FTF-64-12-P	20020616	5	6	Aroclor-1254	3	J	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-P	20020616	5	6	Aroclor-1260	3	J	ug/kg	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Cesium-137	.0474	UNV	pCi/g	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Technetium-99	1.9	UNV	pCi/g	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Thorium-228	1.18	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Thorium-230	6.33	UNV	pCi/g	482638.18	1349387.98
	A6-FTF-64-12-R	20020616	5	6	Thorium-232	1.18	NV	pCi/g	482638.18	1349387.98

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-64-12-R	20020616	5	6	Uranium, Total	6.76	NV	mg/kg	482638.18	1349387.98
	A6-FTF-64-2-L	20020616	0	1	1,1,1-Trichloroethane	470	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-L	20020616	0	1	1,1,2-Trichloroethane	470	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-L	20020616	0	1	Tetrachloroethene	400	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-L	20020616	0	1	Toluene	1100000	UNV	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-M	20020616	0	1	Arsenic	3.18	J	mg/kg	482638.18	1349387.98
	A6-FTF-64-2-M	20020616	0	1	Beryllium	.198	J	mg/kg	482638.18	1349387.98
	A6-FTF-64-2-P	20020616	0	1	Aroclor-1254	14	J	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-P	20020616	0	1	Aroclor-1260	17	J	ug/kg	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Cesium-137	.0421	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Technetium-99	1.92	UNV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Thorium-228	.46	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Thorium-230	8.14	UNV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Thorium-232	.455	NV	pCi/g	482638.18	1349387.98
	A6-FTF-64-2-R	20020616	0	1	Uranium, Total	22.6	NV	mg/kg	482638.18	1349387.98
A6-FTF-65	A6-FTF-65-12-L	20020616	5	6	1,1,1-Trichloroethane	530	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-L	20020616	5	6	1,1,2-Trichloroethane	530	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-L	20020616	5	6	Tetrachloroethene	450	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-L	20020616	5	6	Toluene	1240000	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-M	20020616	5	6	Arsenic	11.2	-	mg/kg	482637.84	1349422.40
	A6-FTF-65-12-M	20020616	5	6	Beryllium	1.18	-	mg/kg	482637.84	1349422.40
	A6-FTF-65-12-P	20020616	5	6	Aroclor-1254	41	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-P	20020616	5	6	Aroclor-1260	41	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Cesium-137	.0356	UNV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Technetium-99	1.79	UNV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Thorium-228	1.36	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Thorium-230	11.1	UNV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Thorium-232	1.26	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-12-R	20020616	5	6	Uranium, Total	6.82	NV	mg/kg	482637.84	1349422.40
	A6-FTF-65-2-D	20020616	0	1	Heptachlorodibenzo-p-dioxins	80	UNV	ng/kg	482637.84	1349422.40
	A6-FTF-65-2-D	20020616	0	1	Octachlorodibenzo-p-dioxin	800	UNV	ng/kg	482637.84	1349422.40
	A6-FTF-65-2-L	20020616	0	1	1,1,1-Trichloroethane	490	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-2-L	20020616	0	1	1,1,2-Trichloroethane	490	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-2-L	20020616	0	1	Tetrachloroethene	410	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-2-L	20020616	0	1	Toluene	1150000	UNV	ug/kg	482637.84	1349422.40

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Note: Radium-226 results are not yet available

APPENDIX D
PREDESIGN CHARACTERIZATION DATA - FIRE TRAINING FACILITY

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-65-2-M	20020616	0	1	Arsenic	3.18	J	mg/kg	482637.84	1349422.40
	A6-FTF-65-2-M	20020616	0	1	Beryllium	.247	J	mg/kg	482637.84	1349422.40
	A6-FTF-65-2-P	20020616	0	1	Aroclor-1254	2	NV	ug/kg	482637.84	1349422.40
	A6-FTF-65-2-P	20020616	0	1	Aroclor-1260	41	UNV	ug/kg	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Cesium-137	.0891	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Technetium-99	1.8	UNV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Thorium-228	.405	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Thorium-230	7.68	UNV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Thorium-232	.399	NV	pCi/g	482637.84	1349422.40
	A6-FTF-65-2-R	20020616	0	1	Uranium, Total	12.9	NV	mg/kg	482637.84	1349422.40
A6-FTF-66	A6-FTF-66-12-L	20020616	5	6	1,1,1-Trichloroethane	500	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-L	20020616	5	6	1,1,2-Trichloroethane	500	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-L	20020616	5	6	Tetrachloroethene	420	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-L	20020616	5	6	Toluene	1160000	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-M	20020616	5	6	Arsenic	9.74	-	mg/kg	482637.82	1349453.80
	A6-FTF-66-12-M	20020616	5	6	Beryllium	.997	-	mg/kg	482637.82	1349453.80
	A6-FTF-66-12-P	20020616	5	6	Aroclor-1254	38	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-P	20020616	5	6	Aroclor-1260	38	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Cesium-137	.037	UNV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Technetium-99	1.62	UNV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Thorium-228	1.12	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Thorium-230	13.2	UNV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Thorium-232	1.08	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-12-R	20020616	5	6	Uranium, Total	4.2	NV	mg/kg	482637.82	1349453.80
	A6-FTF-66-2-L	20020616	0	1	1,1,1-Trichloroethane	550	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-L	20020616	0	1	1,1,2-Trichloroethane	550	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-L	20020616	0	1	Tetrachloroethene	460	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-L	20020616	0	1	Toluene	1270000	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-M	20020616	0	1	Arsenic	7.68	-	mg/kg	482637.82	1349453.80
	A6-FTF-66-2-M	20020616	0	1	Beryllium	.986	-	mg/kg	482637.82	1349453.80
	A6-FTF-66-2-P	20020616	0	1	Aroclor-1254	42	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-P	20020616	0	1	Aroclor-1260	42	UNV	ug/kg	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Cesium-137	.144	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Technetium-99	1.89	UNV	pCi/g	482637.82	1349453.80

Note: Radium-226 results are not yet available

Boring	Sample ID	Sample Date	Sample Depth (feet) Top	Bottom	Parameter	Result	Qualifier	Units	Northing	Easting
	A6-FTF-66-2-R	20020616	0	1	Thorium-228	.991	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Thorium-230	9.7	UNV	pCi/g	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Thorium-232	.979	NV	pCi/g	482637.82	1349453.80
	A6-FTF-66-2-R	20020616	0	1	Uranium, Total	12.9	NV	mg/kg	482637.82	1349453.80
A6-FTF-67	A6-FTF-67-12-L	20020616	5	6	1,1,1-Trichloroethane	520	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-L	20020616	5	6	1,1,2-Trichloroethane	520	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-L	20020616	5	6	Tetrachloroethene	430	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-L	20020616	5	6	Toluene	1200000	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-M	20020616	5	6	Arsenic	6.78	-	mg/kg	482637.71	1349509.64
	A6-FTF-67-12-M	20020616	5	6	Beryllium	1.01	-	mg/kg	482637.71	1349509.64
	A6-FTF-67-12-P	20020616	5	6	Aroclor-1254	41	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-P	20020616	5	6	Aroclor-1260	41	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Cesium-137	.0366	UNV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Radium-226	TBD	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Technetium-99	1.61	UNV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Thorium-228	.993	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Thorium-230	10.4	UNV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Thorium-232	1.02	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-12-R	20020616	5	6	Uranium, Total	4.44	NV	mg/kg	482637.71	1349509.64
	A6-FTF-67-2-L	20020616	0	1	1,1,1-Trichloroethane	530	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-L	20020616	0	1	1,1,2-Trichloroethane	530	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-L	20020616	0	1	Tetrachloroethene	440	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-L	20020616	0	1	Toluene	1220000	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-M	20020616	0	1	Arsenic	10	-	mg/kg	482637.71	1349509.64
	A6-FTF-67-2-M	20020616	0	1	Beryllium	1.07	-	mg/kg	482637.71	1349509.64
	A6-FTF-67-2-P	20020616	0	1	Aroclor-1254	41	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-P	20020616	0	1	Aroclor-1260	41	UNV	ug/kg	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Cesium-137	.147	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Radium-226	TBD	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Technetium-99	2.16	UNV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Thorium-228	1.28	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Thorium-230	9.98	UNV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Thorium-232	1.25	NV	pCi/g	482637.71	1349509.64
	A6-FTF-67-2-R	20020616	0	1	Uranium, Total	13.9	NV	mg/kg	482637.71	1349509.64
A6-FTF-68	A6-FTF-68-2-R	20020806	0	1	Uranium, Total	27.7	NV	mg/kg	482514.38	1349488.84
	A6-FTF-68-4	20020806	1	2	Uranium, Total	10.7	NV	mg/kg	482514.38	1349488.84
	A6-FTF-68-6	20020806	2	3	Uranium, Total	4.33	NV	mg/kg	482514.38	1349488.84

Note: Radium-226 results are not yet available

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APPENDIX E

LIST OF DRAWINGS AND TECHNICAL SPECIFICATIONS

APPENDIX E
LIST OF DRAWINGS AND TECHNICAL SPECIFICATIONS

The following drawings and specifications have been submitted along with this Implementation Plan to constitute the IRDP for Area 6 SWL/FTF:

IRDP DRAWINGS

99X-5500-00725	Drawing Index
99X-5500-00639	Legend and General Notes
99X-5500-00640	Master Plan
99X-5500-00726	Layout Plan
99X-5500-00727	Traffic Flow and Material Tracking Plan
99X-5500-00728	Excavation/Drainage Plan (SWL)
99X-5500-00729	Cross Sections (SWL)
99X-5500-00730	Excavation/Drainage Plan (FTF)
99X-5500-00731	Cross Sections (FTF)
99X-5500-00732	Precertification Configuration
99X-5500-00733	Above-WAC Excavation Details (SWL)
99X-5500-00741	Slope Stability Excavation Plan (SWL)
99X-5500-00738	Civil Details Sheet 1
99X-5500-00740	Utility Removal Detail Below Design Grade

UTILITY GRID REFERENCE DRAWINGS

The following drawings are referenced in this design and are included in this IRDP.

22X-5500-P-00659	Master Grid of Underground Utility Plans
22B-5500-P-00681	Grid 22 Underground Utilities
93X-5900-G-00301	Existing Site and Utility Plan Grid 28
93X-5900-G-00302	Existing Site and Utility Plan Grid 29
93X-5500-G-01846	Master FEMP Benchmark Location Plan

TECHNICAL REFERENCE DRAWINGS

The following drawings are referenced in this design and are included in this IRDP.

For Fire Training Facility:

73X-5500-A-0003	Footing Layout First and Second Floor Plans
73X-5500-A-0006	Sections and Details
73X-5500-G-0001	Plot Plan
73X-5500-X-0002	Elevated Tank, Ground Tank Section and New Fire Line

For Solid Waste Landfill:

21A-5500-G-0216	Sanitary Landfill Plan
21A-5500-G-0217	Sanitary Landfill Sections

IRDP TECHNICAL SPECIFICATIONS

Section 02150	Traffic Control
Section 02205	Material Excavation
Section 02206	Earthwork for Remediation
Section 02207	Area Isolation Trenching
Section 02275	Surface Water Management and Erosion Control for Remediation

SPECIFICATIONS REFERENCED FROM OSDF DESIGN

The following specifications are referenced in this design from the OSDF technical specifications and will be applicable to this remediation effort:

Section 02100	Surveying
Section 02200	Earthwork
Section 02215	Trenching and Backfilling
Section 02230	Road Construction
Section 02270	Surface Water Management and Erosion Control
Section 02930	Vegetation