5038

IMPLEMENTATION PLAN FOR AREA 6 OU1 STOCKPILE AREA

FERNALD CLOSURE PROJECT
FERNALD, OHIO

SEPTEMBER 2003

U.S. DEPARTMENT OF ENERGY

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LIST OF ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental and Industrial Hygienists
ACHP	Advisory Council on Historic Preservation
ALARA	As Low As Reasonably Achievable
ARARs	applicable or relevant and appropriate requirements
ASCOC	area-specific constituent of concern
AWWT	Advanced Waste Water 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
EMS	Excavation Monitoring System
EPA	U.S. Environmental Protection Agency
FCP	Fernald Closure Project
FRL	final remediation level
FTL	Field Tracking Log
GIS	Geographical Information System
HDPE	high density polyethylene
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
mg/kg	milligrams per kilogram
NaI	sodium iodide
MTL	Material Tracking Location
NPDES	National Pollution Discharge Elimination System
NRRP	Natural Resource Restoration Plan
NRTs	Natural Resource Trustees
OEPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office
OSDF	On-Site Disposal Facility
OSHA	Occupational Safety and Health Administration

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

OU	operable unit
pCi/g	picoCuries per gram
PG	Performance Grade
ppm	parts per million
PSP	Project Specific Plan
QA/QC	quality assurance/quality control
RCI	Request for Clarification of Information
RCRA	Resource Conservation and Recovery Act
RCT	Radiological Control Technician
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSS	Radiation Scanning System
RTIMP	Real Time Instrumentation Measurement Program
RTRAK	Radiation Tracking System
RWP	Radiological Work Permit
S&H	Safety and Health
SDFP	Soil and Disposal Facility Project
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SP	Soil Stockpile
SWIFTS	Sitewide Waste Information Forecasting and Tracking System
SWPPP	Storm Water Pollution Prevention Plan
SWRB	Storm Water Retention Basin
SWUs	Southern Waste Units
TBC	to be considered criterion
UST	underground storage tank
VOC	volatile organic compound
WAC	waste acceptance criteria
WAO	Waste Acceptance Organization
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 OU1 Stockpile Area in Remediation Area 6 (General Area) at the Fernald Closure Project (FCP), 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 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 the OU1 Stockpile Area. The plan also discusses project-specific environmental controls and monitoring as well as the remedial action management strategy. The Design Criteria Package, and list of IRDP drawings and specifications are attached to the Implementation Plan as appendices.

The OU1 Stockpile Area is an approximate 4.3-acre area that has been used to stockpile soil and debris. Approximately 8,200 cubic yards of clay material excavated from the cap over Waste Pit #4 is stockpiled in this area.

The primary remedial actions addressed in this Implementation Plan includes the removal of approximately 24,950 cubic yards (yd^3) of impacted material including approximately 15 yd^3 of uranium above-waste acceptance criteria (WAC) (DOE 1998b) material, 8 yd^3 of technetium-99 (TC-99) above-waste acceptance criteria (WAC) material, and 50 yd^3 of debris.

During excavation, impacted material will be transported to either the On-Site Disposal Facility (OSDF) or staged for shipment to an off-site permitted disposal facility.

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.

Section 1

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 Area 6 OU1 Stockpile Area at the Fernald Closure Project (FCP) in southwestern Ohio (Figure 1-1).

Remedial activities in the Area 6 OU1 Stockpile Area 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.

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 FCP was re-organized into nine remediation areas (Figure 1-1) based on the OU concept and including off-site locations adjacent to the FCP property. Area 6 is divided into five components:

- Solid Waste Landfill and Fire Training Facility
- Former Production Area
- Waste Pit Area
- General Area
- OU1 Stockpile Area

This document only addresses the remediation of the Area 6 OU1 Stockpile Area and the does not address the remediation of Area 6 as a whole. The Area 6 Solid Waste Landfill and Fire Training Facility IRDP has already been submitted and approved by the regulatory agencies (see the Implementation Plan for Area 6 Solid Waste Landfill and Fire Training Facility, Rev. 0, dated March 2003). The IRDPs for the Area 6 Former Production Area, Area 6 Waste Pits Area, and the Area 6 General Area will be submitted to the agencies for review and approval at a later date. Henceforth in this document, the Area 6 OU1 Stockpile Area will be referred to as OU1 Stockpile Area.

A schedule for the remediation of OU1 Stockpile Area is provided in Section 6.0 of this Implementation Plan (see Table 6-3).

Section 1.0 of this Implementation Plan describes the scope of work for OU1 Stockpile Area, 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 EXCLUSIONS

This document is being submitted to govern a specific area within Remedial Area 6 and does not address the remediation of Area 6 as a whole. As such, the Area 6 divisions for I) Solid Waste Landfill and Fire Training Facility, II) Former Production Area, III) Waste Pits Area, and IV) General Area are excluded from this document.

Furthermore, a pre-design investigation has been completed in Area 6 for both the SP-7 and OU1 Stockpile Areas (see PSP for Pre-design Sampling in Area 6 SP-7/OU1 Stockpile Area (DOE June 2003). However, the SP-7 Stockpile Area is excluded from this document because of continuing waste placement operations in the SP-7 Stockpile Area that are scheduled to continue into 2004.

1.2 REMEDIATION AREA BACKGROUND AND DESCRIPTION

The OU1 Stockpile Area is in the eastern portion of the Waste Storage Area (see Figure 1-2). The area is approximately 5 acres and is located west of the Plant 1 Pad (74T), the Hooperville trailer complex, and a portion of the Impacted Material Haul Road; east of the OU1 Treatment Facility and associated rail line; south of the Solid Waste Landfill; and north of 2nd Street.

During the history of the plant, no known production facility or process has been located within the OU1 Stockpile Area; however, the area has been used to stockpile soil and debris.

In November of 1988, clay obtained from an area within the former security buffer zone (northwest of Pit 5, north of the main railroad track, and east of the railroad trestle) was used to construct the cap over Waste Pit #4 (see Figure 1-3). Due to frequent rains in November of that year, the exposed surface of the clay cap often became too wet to meet placement criteria and it was not practical to dry the clay in-place because of the cold temperatures. Instead, the immediate surface of the clay was periodically removed and spoiled in the area that is now being called the OU1 Stockpile Area. The clay that was removed and spoiled did not come in contact with the waste material from the pit as the clay cap was constructed over a contouring layer constructed from material borrowed from the east SWRB excavation stockpile. It is not known if this spoiled clay material was later removed from the OU1 Stockpile Area or if it remains there.

Between April 1996 and September 1997, approximately 18,400 cubic yards of contaminated soil and debris were placed within the OU1 Stockpile Area in a stockpile known as the SP6. The soil and debris placed in this stockpile were excavated primarily in support of the OU1 Site Improvement Project and the North Rail Yard area (see Table 1-1 for a material inventory of SP6). This stockpile contained materials that exceeded the On-Site Disposal Facility waste acceptance criteria (OSDF-WAC) and was excavated and shipped to Envirocare for disposal in 1999.

During the autumn of 2002, approximately 8,200 CY of the clay used to cap Waste Pit #4 were excavated and stockpiled in the northern portions of the OU1 Stockpile Area. The cap material had previously been sampled and analyzed to demonstrate compliance with OSDF-WAC (see the Waste Pit 4 Cap Excavation Implementation Plan) (DOE 2002b).

During the summer of 2003, Waste Management performed sheering operations at the northern end of the OU1 Stockpile Area to size reduce various materials for disposed in the OSDF. This operation not only involved the sheering of materials and debris left over from Waste Management operations but also included material from across the site that meets the OSDF chemical/radiological WAC but did not meet the OSDF physical WAC. Examples of materials that were sheered included metal boxes and fork-lift trucks.

1.3 SCOPE AND GENERAL APPROACH OF THE IMPLEMENTATION PLAN

The OU1 Stockpile Area 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 OU1 Stockpile Area, which describes the COCs for the OU1 Stockpile Area, 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. The Waste Pit 4 cap material stockpiled within the OU1 Stockpile Area has previously been sampled and analyzed to demonstrate compliance with OSDF-WAC (see the final Waste Pit 4 Cap Excavation Implementation Plan) (DOE 2002c).

- Section 3.0 – 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 FRLs for all COCs.

- Section 4.0 – 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 5.0 – Project-Specific Health and Safety, which summarizes project-specific health and safety requirements and procedures.

- Section 6.0 – 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 OU1 Stockpile Area remediation with other FCP 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 – Characterization Data for the OU1 Stockpile Area, which tabulates all predesign characterization data used to develop the remedial design.

- Appendix C – Surface Water Calculations, which provides background for sizing culverts to be installed.

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

The area-specific RD/RA process at the FCP 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.

1.4 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.

1.4.1 Predesign Investigation

Predesign activities began in the OU1 Stockpile Area in June 2003. Sampling activities focused on material exceeding the final remediation levels (FRLs) at the surface and samples were collected at the two-foot to two and on half-foot interval to establish an elevation of soil that met the FRLs without specifically bounding each and every result that was above FRL. The Project Specific Plan (PSP) for Predesign Sampling in Area 6 SP-7/OU1 (DOE 2003b) was developed to bound above-WAC concentrations as well as to drive remediation to achieve FRLs. The only above-WAC COCs in this area are total uranium and technetium-99. In addition to physical sampling, this area has been surveyed with real-time instruments to assess above-WAC radiological contamination associated with uranium. The remaining surface will be surveyed with the real-time instruments after the overlying material is removed, to ensure all above-WAC uranium contamination was removed.

1.4.2 Remedial Design

The RD began in July 2003 and will continue through completion of the Certified for Construction (CFC) packages in October 2003. RD activities include the Conceptual Design and Title I/II design. Title I/II design for OU1 Stockpile Area began in July 2003, and the specifications and drawings submitted with this IRDP build upon the Area 3B/4B/5 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
- Data collected during predesign investigations to delineate the extent of contamination for above-WAC, and below-WAC zones

1.4.3 Remedial Action

The RA for the OU1 Stockpile Area will be performed in accordance with Section 3.0 and is scheduled as indicated in Table 6-3.

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 3.3) and to evaluate potential reduction of the below-FRL soil volume that is hauled to the OSDF. 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 OSDF-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.

Interim grading of the OU1 Stockpile Area to obtain long-term stable slopes will be completed as part of the remedial action. In addition, permanent seeding will be placed over the remediated area once precertification of the area has been performed.

1.4.4 Precertification

The precertification of the OU1 Stockpile Area has not been performed but will be performed in accordance with Sections 3.9.

1.4.5 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 OU1 Stockpile Area will not be governed by this IRDP (refer to Table 6-3 for the submittal schedule).

1.4.6 Post-Remedial Action

Interim grading of the OU1 Stockpile Area to obtain long-term stable slopes will be completed as part of the remedial action. Final restoration and post remedial action will follow interim grading and be guided on a sitewide basis by the final version of the NRRP.

1.5 SUMMARY OF THE REGULATORY DRIVERS

The regulatory requirements, criteria and legal obligations that constitute the drivers for FCP remediation activities are presented in Section 1.3.1 of the SEP. Those regulatory drivers applicable to the OU1 Stockpile Area remediation are summarized in this section.

1.5.1 ARARs and TBCs

Appendix A includes the subset of ARARs and TBCs that will guide remedial actions in the OU1 Stockpile Area.

1.5.2 Permits

The National Pollutant Discharge Elimination System (NPDES) permit (Permit No. 1IO0000*GD), for storm water and wastewater discharges to Paddys Run and the Great Miami River, is the permit that is applicable to OU1 Stockpile Area remediation. Activities involved in the remediation of the OU1 Stockpile Area are anticipated under the existing NPDES permit; therefore, no modification to the permit is required. Storm water discharges from the OU1 Stockpile Area will drain to the former Lime Sludge Ponds (LSP). Discharge from the former LSP will either be to Paddys Run (if U < 30 ppb) or to AWWT Phase I treatment via the existing storm sewer system (if U > 30 ppb). Compliance with the existing permit will be demonstrated through the effective implementation of the FCP Storm Water Pollution Prevention Plan (SWPPP). Applicable effluent limits will be met regardless of the route of the discharge from the former LSP (AWWT Phase 1 or Paddys Run).

1.5.3 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 OU1 Stockpile Area remedial design.

Conceptual restoration designs for the OU1 Stockpile 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.

1.5.3.1 Threatened and Endangered Species

Based on updated FCP 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 OU1 Stockpile Area remediation project. Therefore, no additional threatened or endangered species surveys are planned for the area.

1.5.3.2 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 2.27 acres of wetlands that have been formed as the result of construction activities at the FCP. Although DOE plans to avoid or minimize impacts to these areas to the maximum extent practicable during remediation, approximately 11.87 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 FCP.

The NRRP includes DOE plans for conducting wetland mitigation activities at the FCP. The NRRP currently includes plans to conduct two wetland mitigation projects to create the required 17.8 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 FCP and will be submitted to the appropriate regulatory agencies.

1.5.3.3 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 FCP, 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.

1.5.3.4 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) (DOE 1997), pursuant to 36 Code of Federal Regulations (CFR) Part 800.13. The OU1 Stockpile Area was excluded from survey due to past disturbances during site construction and operation. However, any unexpected discoveries of cultural resources during project activities will be managed per the Programmatic Agreement and applicable regulations.

1.6 COMPONENTS OF THE REMEDY

OU1 Stockpile Area remediation activities address specific components of the selected remedies set forth in the 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 FCP RA plans. A summary of 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 OU1 Stockpile Area, follows:

- 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 OU1 Stockpile Area 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 3.3 and 6.5.

- *Treat materials to meet OSDF and/or off-site disposal facility WAC.* No material in OU1 Stockpile Area is expected to require treatment to meet OSDF WAC.

- *Dispose of materials that exceed the OSDF WAC off site; dispose of remaining materials in the OSDF.* Sections 3.3 and 6.5 discuss material handling.

- *Establish administrative controls through deed restrictions and access controls.* Access controls will be maintained for OU1 Stockpile Area 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.

  - *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 (Section 2.0), the material will be excavated as described in Section 3.0. Mitigation measures to minimize short term impacts will be taken with respect to natural and cultural resources (Sections 1.5.3 and 4.1), air pathway (Section 4.2), water pathways (Sections 4.3 and 4.4), and health and safety (Section 5.0).

  - *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 3.9) 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 OU1 Stockpile Area 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).* Storm water will be routed to the former Lime Sludge Pond excavation. If the water level in the Lime Sludge Ponds excavation becomes to high, water from the excavation will be pumped into the existing storm sewer system to drain to the Storm Water Retention Basins for subsequent AWWT Phase I treatment.

- *Collect contaminated storm water, using the existing FCP 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 routed to the former Lime Sludge Pond excavation. If the water level in the Lime Sludge Ponds excavation becomes to high, water from the excavation will be pumped into the existing storm sewer system to drain to the Storm Water Retention Basins for subsequent AWWT Phase I treatment.

- *Continue to employ institutional controls, including access controls and monitoring, to ensure continued protectiveness.* Access to the OU1 Stockpile Area 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 2003a). 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 OU1 Stockpile Area 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.

1.7 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), Area 3A/4A, and Area 3B/4B/5 have been incorporated into the OU1 Stockpile 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:

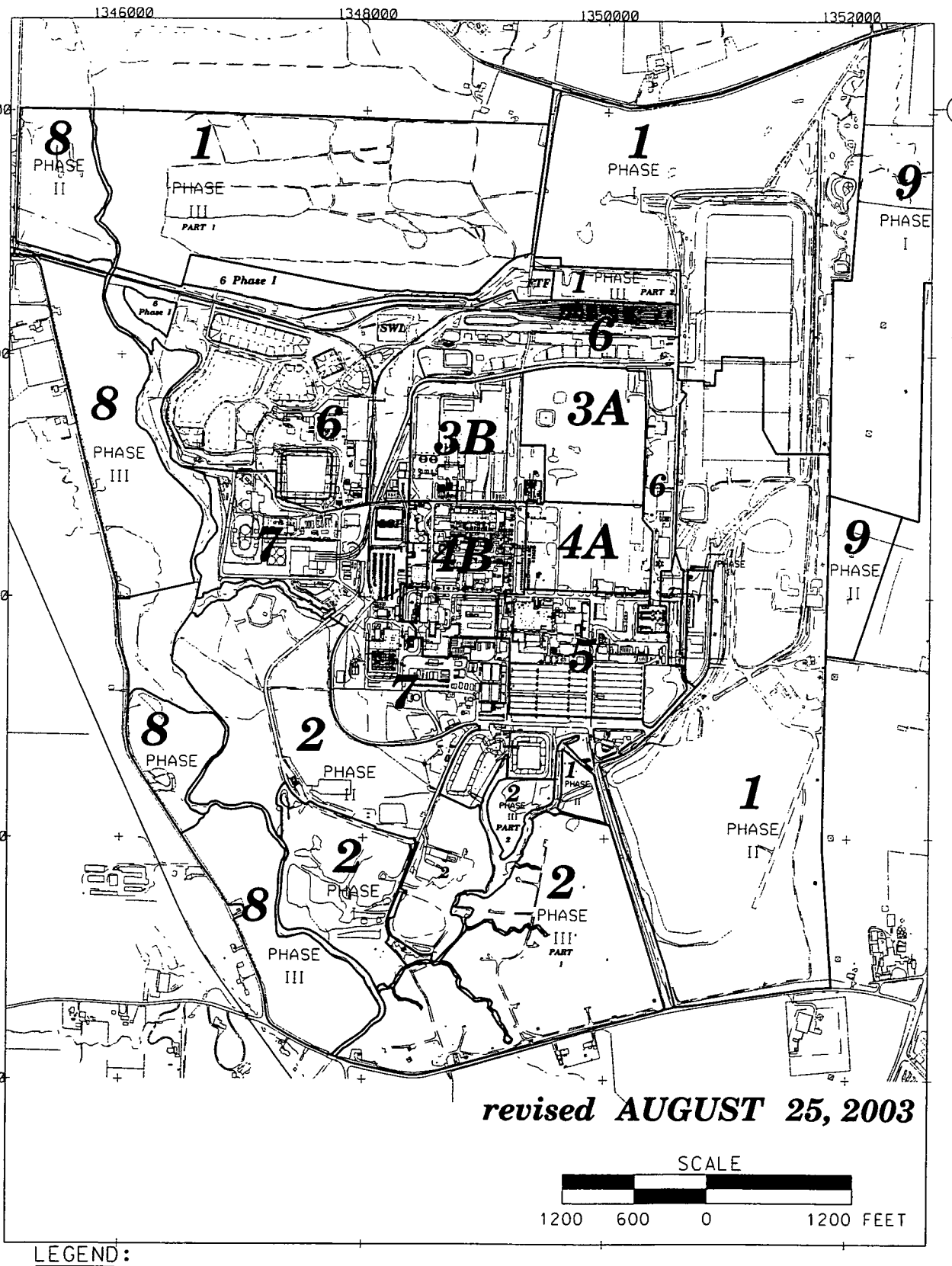
- Establish a single project director that is responsible for the entire remedial effort in an area
- Obtain regulatory approval on PSPs prior to implementing the work
- Complete sampling and analysis activities before submitting IRDP (if possible), and include all data in the Implementation Plan
- Identify excavation depth and sample control points on figures
- 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 FCP will continue to evolve with each successive remedial effort.

TABLE 1-1

OU1 STOCKPILE (SP6): INVENTORY OF MATERIALS

Item	Source/Location	Date of Placement	Placement Quantity (Cubic Yards)
1	Top soil from OU1 site prep	4/96 – 2/97	11,500
2	Top soil from main ditch, site rail improvement grading and drainage	4/96 – 2/97	1,000
3	Concrete rubble (contaminated materials west of RR Track #12)	4/96 – 2/97	2,500
4	Sand below High Nitrate Tank	4/96 – 2/97	600
5	Contaminated materials from Triangle area and along gravel road	4/96 – 2/97	1,000
6	Other contaminated materials in OU1 site improvement area	4/96 – 2/97	1,500
7	K-65 Ditch Line Soils – no rubble/debris	5/97	264
8	K-65 Trench: Haul Road	7/97	30
TOTAL	---	---	18,394



LEGEND:

1 REMEDIATION AREA

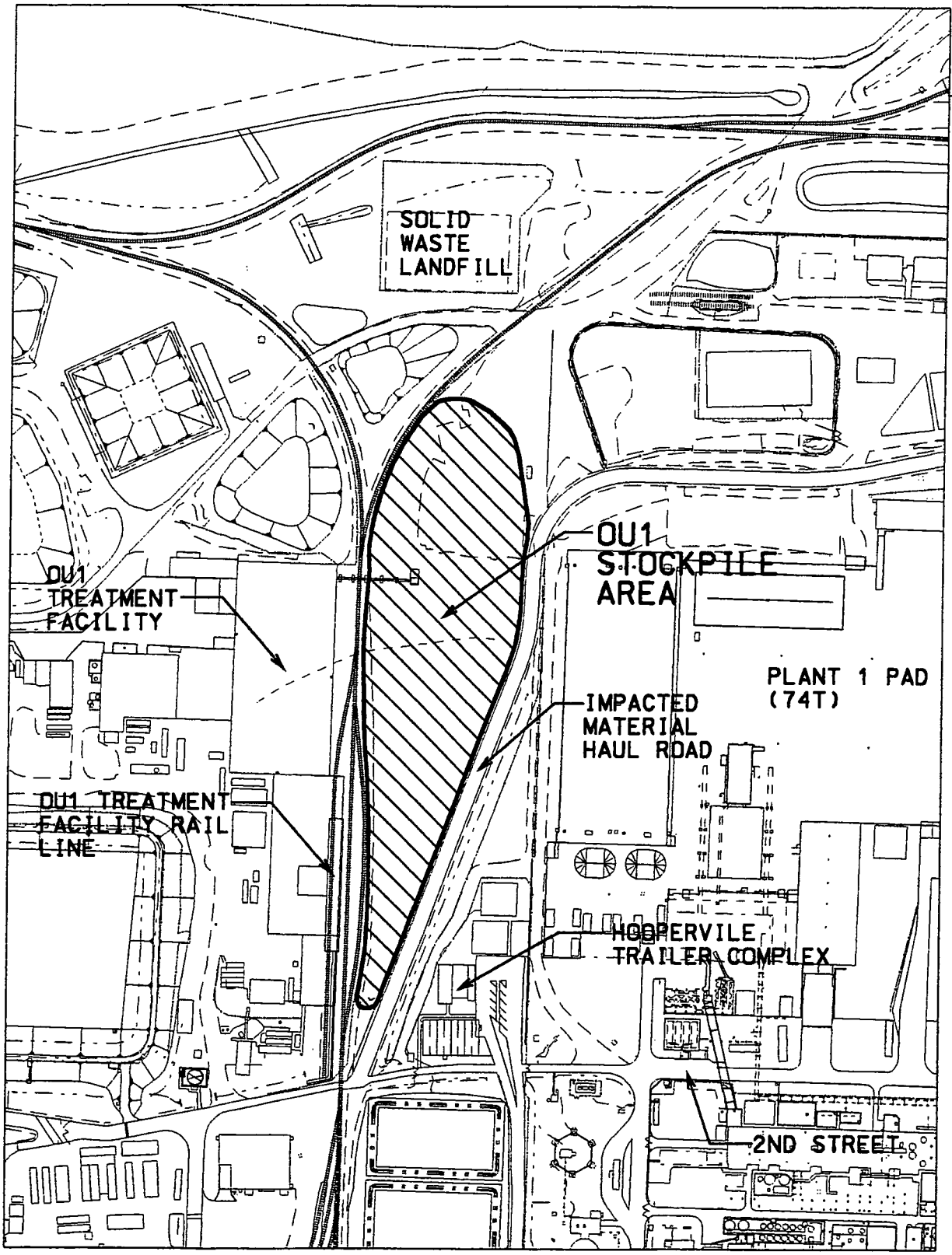
——— REMEDIATION AREA BOUNDARIES

FIGURE 1-1.
GENERALIZED SITEWIDE REMEDIATION AREAS

v:\5cj31\dgn\bmp\crt_area.dgn

STATE PLANAR COORDINATE SYSTEM 1983

28-AUG-2003



LEGEND:

OU1 STOCKPILE AREA

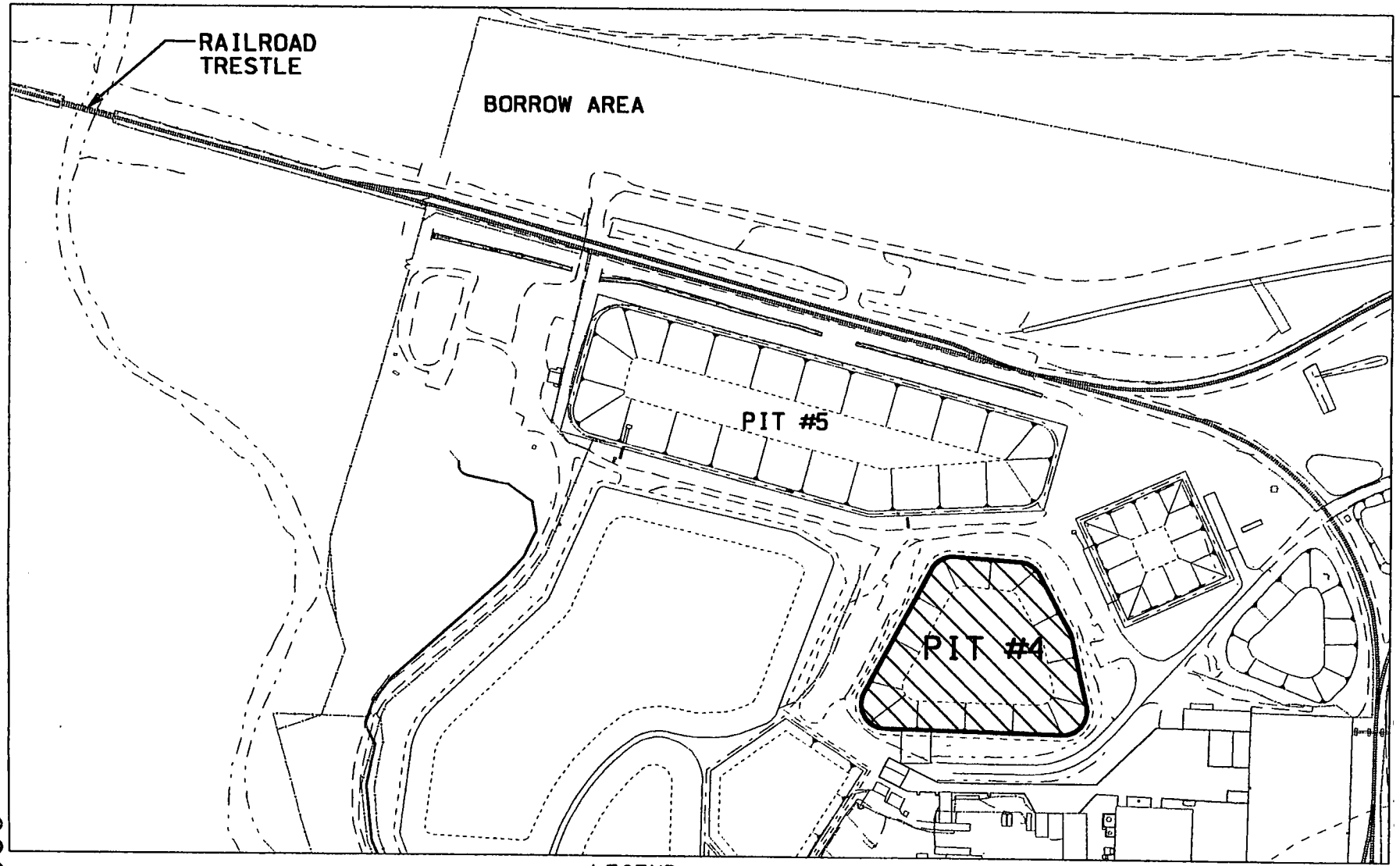
SCALE

250 125 0 250 FEET

DRAFT

FIGURE 1-2.

v:\e2fmf2\edgn\ou6_070.dgn
STATE PLANAR COORDINATE SYSTEM 1983
25-AUG-2003



LEGEND:

WASTE PIT #4 CAP
BORROW AREA

SCALE
250 125 0 250 FEET

DRAFT

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STATE PLANAR COORDINATE SYSTEM 1983

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FIGURE 1-3.

000025

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Section 2

2.0 PRE-DESIGN INVESTIGATIONS AND CHARACTERIZATION DATA

2.1 SUMMARY OF THE RI/FS INVESTIGATION

Extensive soil sampling was performed at the FCP in the late 1980s and early 1990s as part of the RI/FS to characterize the nature and extent of contamination resulting from uranium-metal production activities at the site. Figure 2-1 presents RI/FS soil sampling locations within the OU1 Stockpile Area.

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 area-specific COCs would be performed for each remediation area during the design phase.

2.1.2 On-Site Disposal Facility Waste Acceptance Criteria

The OSDF WAC were established in the OU2 and OU5 RODs (Table 2-2). Soil excavated from OU1 Stockpile Area must meet these concentration-based WAC to be eligible for disposal in the OSDF. If soil exceeds the OSDF WAC, it will have to be segregated for off-site disposal. The Area 6 RI/FS data were compared to the OSDF WAC to identify areas that exceeded the OSDF WAC and would need to be segregated during excavations. The results of this comparison were studied to determine which areas required additional data to delineate the extent of the above-WAC contamination. Sampling performed to further delineate the above-WAC contamination is discussed in Section 2.3

2.1.3 Final Remediation Levels for Soil

Like the OSDF WAC, the OU5 ROD established the FRLs for soil remediation (Table 2-3). FRLs are the cleanup goals for the FCP site and are defined as the average concentration of a contaminant that can remain in the soil and be considered protective of human health and the environment. Remediation in OU1 Stockpile Area will remove contaminated soil until the residual contaminant concentrations are at or below the respective FRL. The FRL for total uranium is 82 mg/kg and a goal driven by the ALARA philosophy has been set to meet 50 mg/kg. 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 + or - 1-foot) of soil exceeding the uranium FRL of 82 mg/kg.

A search of the RI/FS data was performed to identify all areas containing above-FRL concentrations for the preliminary COCs in OU1 Stockpile Area. Sampling performed to further delineate the above-FRL contamination is discussed in Section 2.3.

2.1.4 Hazardous Waste Management Units

There are no HWMUs associated with the OU1 Stockpile Area.

2.1.5 Underground Storage Tanks

There are no USTs associated with the OU1 Stockpile Area.

2.1.6 Identification of Potentially Characteristic Areas

There are no potentially characteristic areas associated with the OU1 Stockpile Area.

2.2 SUMMARY OF SURFACE AND SUBSURFACE PHYSICAL CONDITIONS

The OU1 Stockpile Area is a flat, irregularly shaped area of approximately 6 acres lying between the waste pits and the former process area. The northern part of the area is the former site of SP-7 and includes the current lined, above-WAC stockpile area. The area is bounded on the west by the rail spur and on the east by the haul road, was used at one time as temporary storage of clay soil from liner construction activities for Waste Pit 4. Individual soil piles (of approximately one truckload each) can be seen in this area in site photos from 1988 but do not appear in later site photos.

2.3 SUMMARY OF PRE-DESIGN INVESTIGATIONS

A pre-design investigation has been completed to supplement RI/FS information on the nature and extent of contamination in Area 6 (PSP for Pre-design Sampling in Area 6 SP-7/OU1 Stockpile Area (DOE June, 2003)). The specific goals were to bound above-WAC or above-FRL areas with physical sampling and to confirm the location of surface above-WAC areas through real-time scanning. The new pre-design sample locations are shown in Figure 2-2 with WAC and FRL bounding sample elevations given in feet above man sea level. Because of continuing operations in the SP-7 portion of Area 6 only the OU1 portion of the PSP has been completed to date.

Sections 2.3.1 and 2.3.2 summarize and discuss the sampling and analysis performed under this investigation. Appendix B includes analytical results from the pre-design investigation.

2.3.1 Surface Investigation

The Real-Time Radiation Tracking System (RTRAK) is utilized for larger flat areas that are readily accessible. The Radiation Scanning System (RSS) is utilized for smaller areas, gradual slopes, or areas not accessible by the RTRAK. The high-purity germanium (HPGe) detector is utilized for areas that are inaccessible to both the RTRAK and the RSS.

Real-time scanning, using the Radiation Tracking System (RTRAK) and high-purity germanium (HPGe) detectors, was performed on all accessible soil and gravel cover in the OU1 Stockpile Area. The results are shown in Figure 2-3. The highest detected total uranium value was 307 ppm as indicated on the figure.

An above-WAC historical sample for total uranium (1628.21 mg/Kg at 0 to 0.17 feet in boring CIS-SYSGEN-508) that was bounded at a depth of 1.0-foot in the historical data was bounded horizontally with real-time data as shown in Figure 2-4. The real-time scan determined there was no above-WAC material at the four bounding scans around the CIS_SYSGEN_508 location so the above-WAC material at this location is within the 16-foot diameter circle of the scan taken at the location of CIS_SYSGEN_508.

2.3.2 Subsurface Investigations

2.3.2.1 Extent of Above-WAC Contamination

A search of the Sitewide Environmental Database (SED) for data from all borings in the OU1 Stockpile Area indicated that Total Uranium and Technetium-99 were the only constituents that exceeded OSDF WAC. These above-WAC locations were sampled under the PSP referenced above and results are described below.

An above-WAC historical sample for Technetium-99 (93 pCi/g at 0 to 0.17 feet in boring CIS_SYSGEN_702) was bounded horizontally with pre-design samples at borings A6-OU1-6 through A6-OU1-9 taken at 10-foot distances in the four cardinal directions from the original boring. These horizontal bounding samples were taken at depths of 0 to 0.5 feet and were all below WAC for Technetium-99. The above-WAC result was bounded vertically with pre-design samples at the original boring location (new boring A6-OU1-5) taken from 0 to 0.5 feet and from 0.5 to 1.0-foot, both with below-WAC results for Technetium-99.

An above-WAC historical sample for Total Uranium (2090.3 mg/Kg at 0 to 0.5 feet in boring CIS_SYSGEN_716) was bounded vertically with the original boring and horizontally with pre-design samples at borings A6-OU1-22 through A6-OU1-25 taken at 5-foot distances in the four cardinal directions from the original boring. These horizontal bounding samples were taken at depths of 0 to 0.5 feet and were all below WAC

2.3.2.2 Extent of Above-FRL Contamination

As discussed in the PSP – RI/FS data indicates above FRL throughout the area in the surface areas. The predesign approach was to establish an elevation that exhibited below FRL conditions for all area specific constituents of concern. The predesign data demonstrated below FRL conditions for all ASCOC except one. An above-FRL value for PCB's (Aroclor-1254 and Aroclor-1260) was found in the new pre-design samples from boring A6-OU1-15 at 2.0 to 2.5 feet. This result was bounded horizontally with additional pre-design samples taken at borings A6-OU1-18 through A6-OU1-21 taken at 5-foot distances in the four cardinal directions from the boring A6-OU1-15 at depths of 2.0 to 2.5 feet. All results were below-FRL. The above-FRL area was bounded vertically with two additional pre-design samples at boring A6-OU1-15 taken from 3.0 to 3.5 feet and from 5.0 to 5.5 feet, both with below-FRL results for PCB's.

2.4 IDENTIFICATION OF AREA-SPECIFIC COCs

Table 2-1 identifies the preliminary list of COCs for Area 6 that was based on the results of sampling and analysis performed during the RI/FS investigation. After an examination of the RI/FS data and the pre-design sampling data from the OU1 Stockpile Area, a revised list of COCs was developed (Table 2-4). The list of primary COCs is unchanged and the secondary COC list is reduced to PCB's (Aroclor-1254 and Aroclor-1260) and Technetium-99. The pre-design sampling identified an FRL exceedance for the PCBs at boring A6-OU1-15 and the historical sampling contained an above WAC result for Technetium-99 at boring CYS_SYSGEN_702. There were no other COCs found in the RI/FS or the pre-design data with concentrations greater than the respective FRL.

2.5 ANTICIPATED EXCAVATION BOUNDARIES

2.5.1 Above-WAC Material

Technetium-99 and Total Uranium are the only known above-WAC constituents in the OU1 Stockpile Area. The Technetium-99 above-WAC area was bound horizontally by pre-design sampling at distances of 10 feet in the four cardinal directions from the original sample location resulting in a square boundary 20 feet by 20 feet by 1-foot deep.

There were two above-WAC areas for total uranium. One (at boring CIS_SYSGEN_508) was bound with real-time scanning and the other (at boring CIS_SYSGEN_716) by sampling. The real-time scan determined there was no above-WAC material at the four bounding scans around the CIS_SYSGEN_508 location so the above-WAC material at this location is within the 16-foot diameter circle of the scan taken at the location of CIS_SYSGEN_508 by 1-foot deep. The second above-WAC area for total uranium at boring CIS_SYSGEN_716 was bound by physical sampling at distances of 5 feet in the four cardinal

directions from the original sample locations resulting in a square boundary 10 feet by 10 feet by 1-foot deep.

2.5.2 Above-FRL Material

All above-FRL values from the RI/FS data were at depths of 1-foot or less. Therefore the area wide two-foot scrape will recover most of the above-FRL material sampled by the historical data in the OU1 Stockpile Area. Some of the RI/FS samples with above-FRL results for uranium taken in 1993 did not have reference elevations recorded. A 1993 topographic map of the OU1 Stockpile Area was used to project an estimated surface elevation for these above-FRL uranium samples with missing reference elevations. Five above-FRL uranium samples appeared to remain after the two-foot scrape. These five sample locations were: CIS_SYSGEN_474, CIS_SYSGEN_543, CIS_SYSGEN_557, CIS_SYSGEN_570, and CIS_SYSGEN_577.

An examination of the 1993 topographic map indicates a drainage ditch or trough running parallel with the line of the five above-FRL samples with bottom elevations at or near 581 feet above mean sea level. An examination of the 2003 topographic map in this same area indicated the ditch or trough has been re-graded and filled in since the 1993 RI/FS samples were taken. Therefore the preliminary design surface with a 2-foot area-wide scrape was modified to include the five RI/FS samples with above-FRL results for uranium that were taken in the 1993 drainage ditch.

An above-FRL value for PCB's (Aroclor-1254 and Aroclor-1260) was found in the new pre-design samples from boring A6-OU1-15 at 2.0 to 2.5 feet. This result was bounded horizontally with additional pre-design samples taken at 5-foot distances in the four cardinal directions from the boring A6-OU1-15 resulting in a square boundary 10 feet by 10 feet. This above-FRL area was bounded vertically with two additional pre-design samples taken from 3.0 to 3.5 feet and from 5.0 to 5.5 feet, both with below-FRL results for PCB's. The amount of excavation necessary to capture all above-FRL soil was determined by plotting the location of the contamination, drawing an excavation shape around the boundary, and fitting safe slopes to the indicated bounding depths. The fitted safe slopes correspond to the design excavation depths.

To verify that above-FRL soil has been captured by the excavation profiles, the depth of the each above-FRL RI/FS and pre-design 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) as shown in Figure 2-5. The diagonal line corresponds to a slope of 1:1 where excavation depths equal above-FRL depths. Figure 2-5 indicates that the excavation surface elevation depth is less than the sample depth at each above-FRL sample location.

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
PAHsb

[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

ON-SITE DISPOSAL FACILITY 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
SOIL FINAL REMEDIATION LEVELS (FRLs)

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 2-4

REVISED AREA-SPECIFIC CONSTITUENTS OF CONCERN

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Aroclor-1260
Thorium-228	Technetium-99
Thorium-232	
Total Uranium	

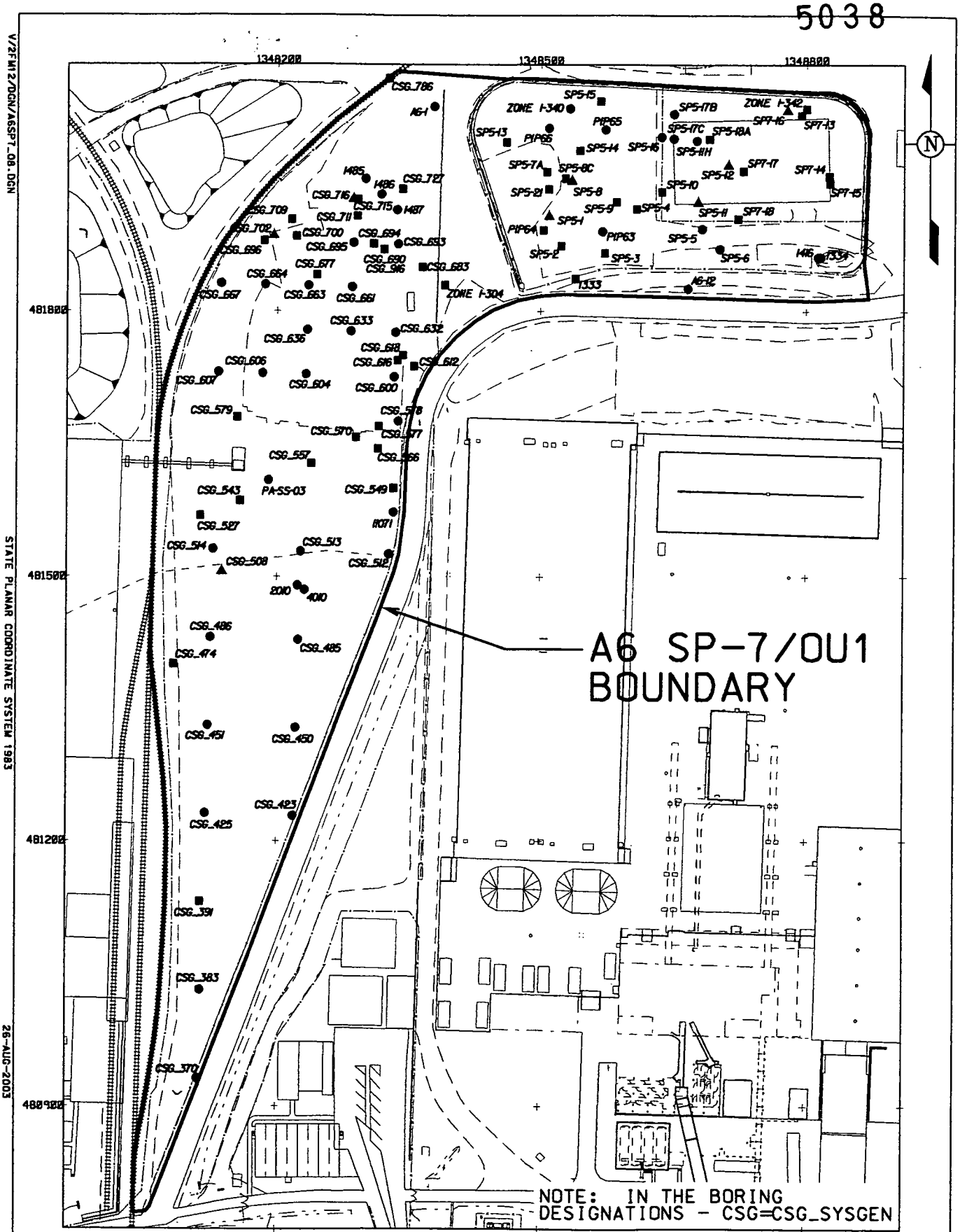
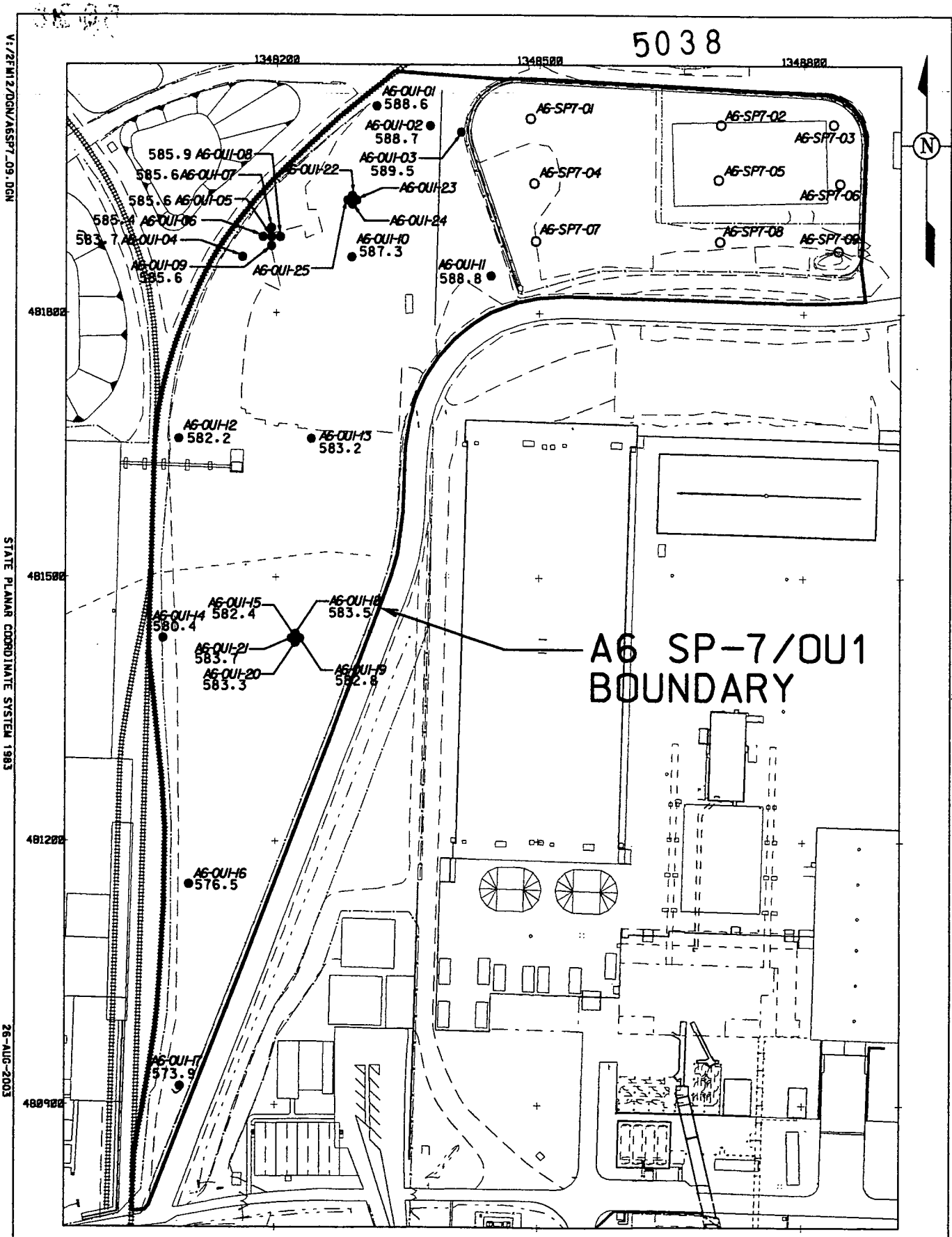


FIGURE 2-1. HISTORICAL SAMPLE LOCATIONS, A6 SP-7/OU1



LEGEND:

- o PROPOSED SAMPLE LOCATION
- • COMPLETED SAMPLE LOCATION

SCALE

150 75 0 150 FEET

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STATE PLANAR COORDINATE SYSTEM 1983

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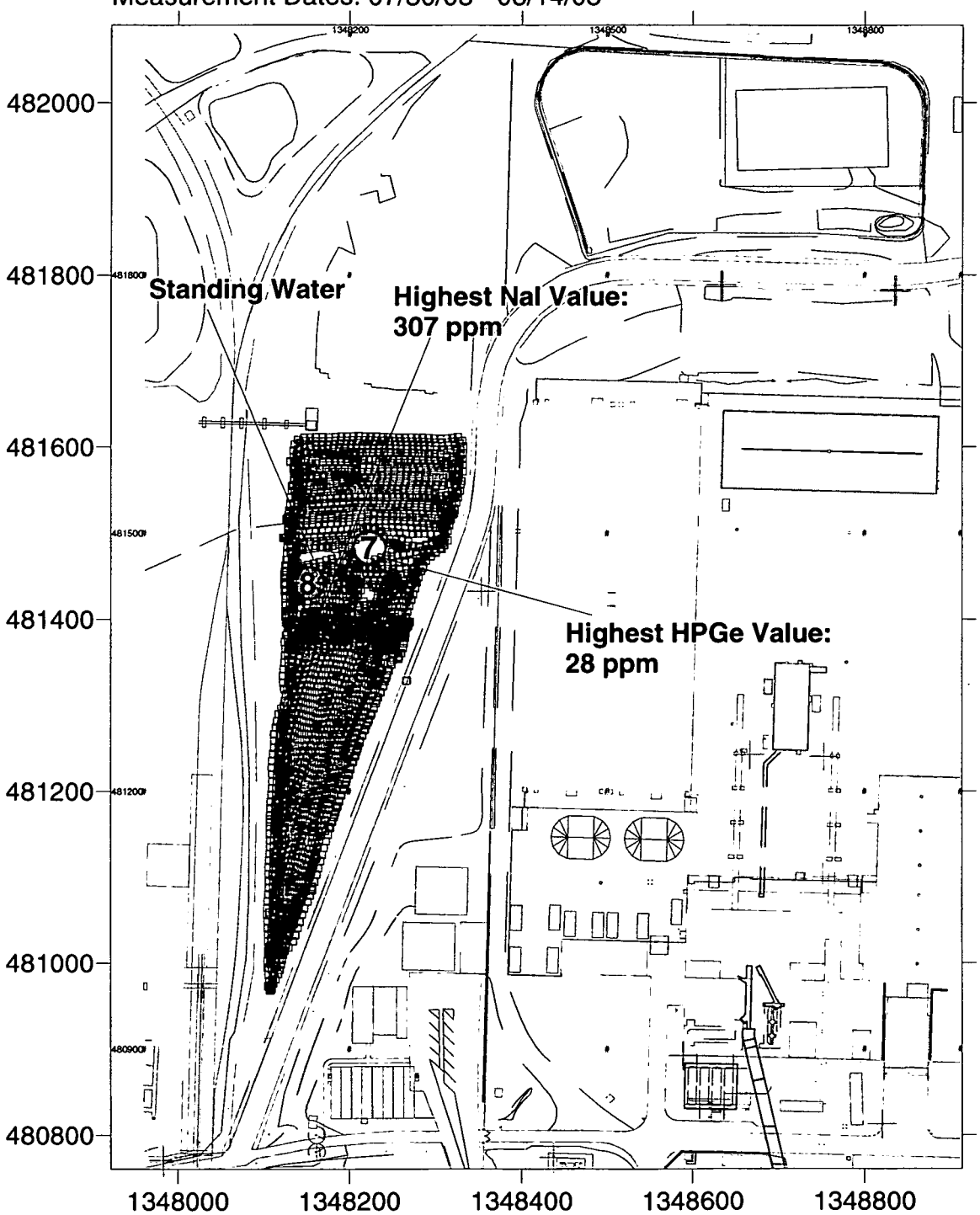
FIGURE 2-2. SAMPLE LOCATIONS, A6 SP-7/OU1

Figure 2-3, Area 6 OU1
Pre-Design Surface Scan for Uranium

Moisture Corrected Total Uranium
Field of View Scale
HPGe DET#: 30687, 30904
NaI Batch#: RTRK- 1004, 1030
Measurement Dates: 07/30/03 - 08/14/03

N



NaI
Total U (ppm)
- -129 to 246
- 246 to 721
- 721 to 9999

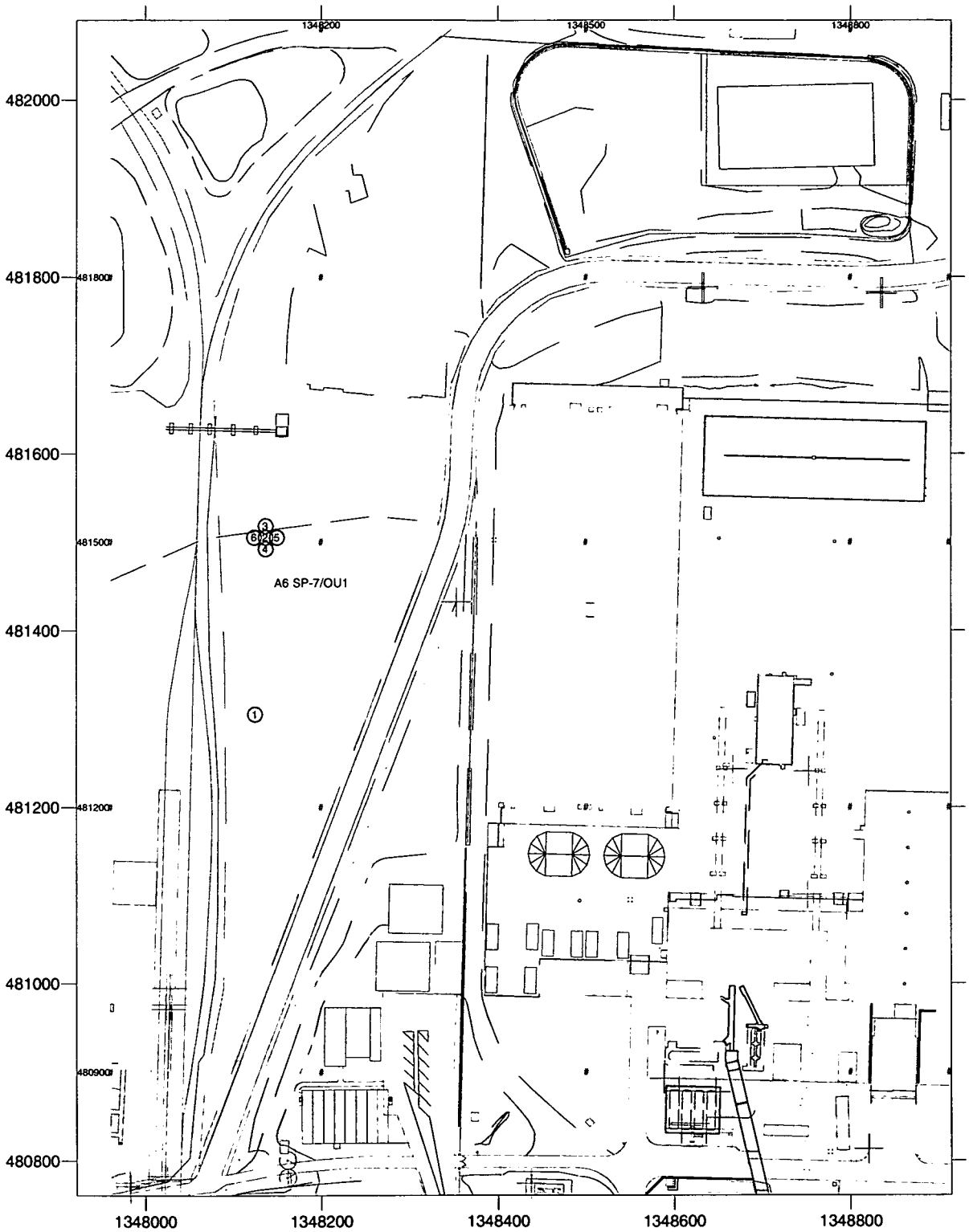
RTIMP DWG Title: A6_SP7_OU1_SF_TU.srf
Project Name: Predesign Sampling in A6 SP7/OU1
Project #: 20650-PSP-0001
Prepared By: Brian McDaniel/11058
Date Prepared: 08/14/03
Support Data: A6_SP7_OU1_SF_NaI.xls
A6_SP7_OU1_SF_HPGe_100cm.xls

Figure 2-4
Area 6, OU1, Phase 2 Scan

5038

N

Moisture Corrected Total Uranium
Field of View Scale
HPGe DET#: 30687, 30904
Measurement Date: 08/14/2003



HPGe
Total U (ppm)
- 0 to 246
- 246 to 928
- 928 to 9999

RTIMP DWG Title: A6_SP7_OU1_P2_TU.srf
Project Name: Predesign Sampling in A6 SP7/OU1
Project #: 20650-PSP-0001
Prepared By: Curt Baumann/78329
Date Prepared: 08/14/03
Support Data: A6_SP7_OU1_P2_HPGe_31cm.xls

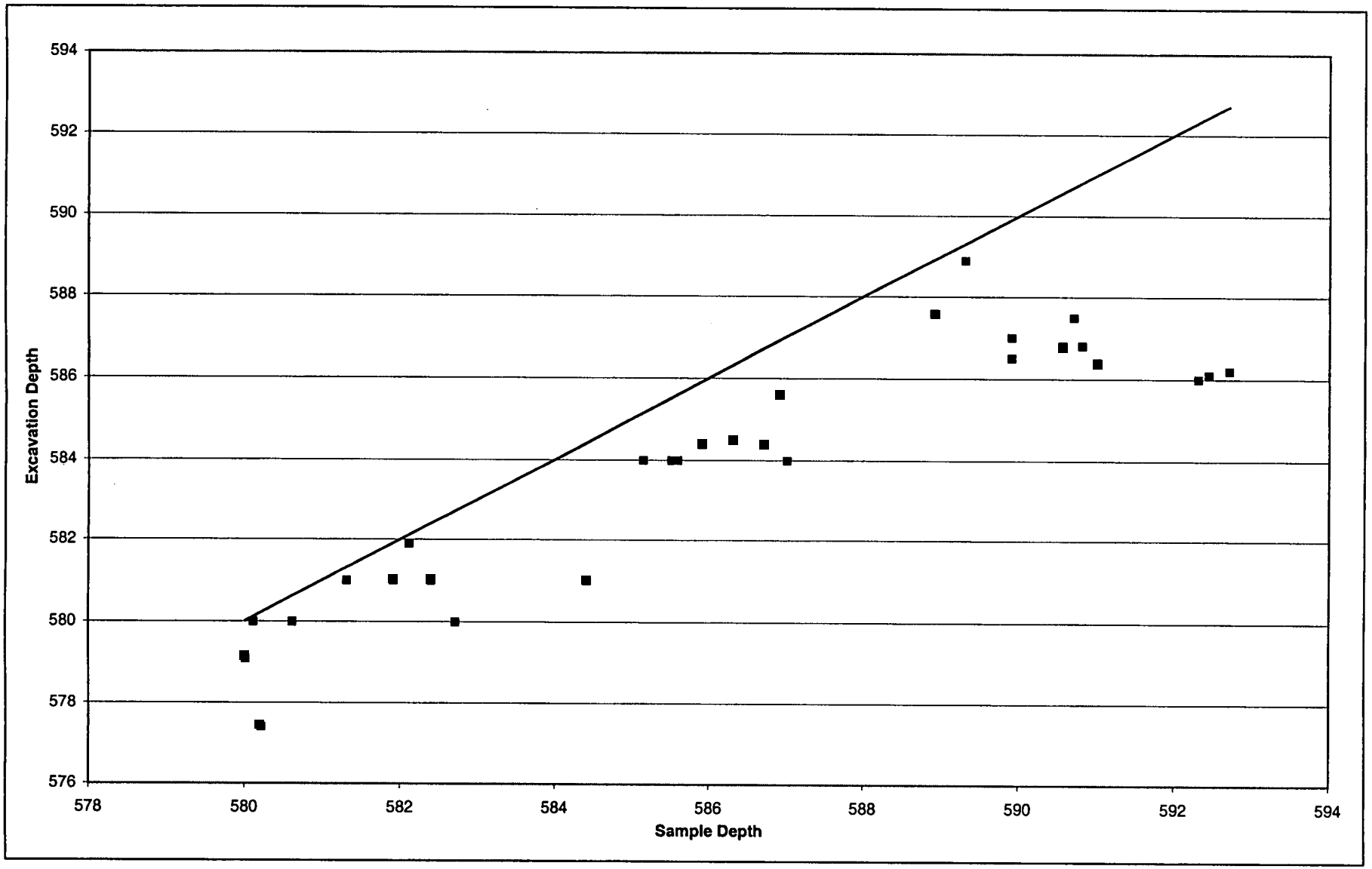


Figure 2-5. VARIATION OF EXCAVATION DEPTH WITH SAMPLE DEPTH

Section 3

3.0 REMEDIAL APPROACH

3.1 SITE PREPARATION

Site preparation activities associated with this work include establishing site boundaries and controls, surveying and site layout, establishing support facilities, surface water management, and performing real-time scanning. Real time scanning may be required if site preparation activities involve soil disturbance below a depth of 6 inches. WPRAP will remove the above-grade portion of the OU1 Material Handling Building Soil Conveyor prior to excavation of the area.

This work will be performed in a uranium contamination area and a thorium air borne area. As such, respirators will be required for all work performed in the work area.

A vehicle entry point will be established on the northeast side of the excavation north of the Impacted Material Haul Road.

3.2 STORM WATER MANAGEMENT

The OU1 Stockpile Area currently drains through an 18-inch HDPE storm sewer line located approximately 120 feet west of trailer T-68C (see drawing 22B-5500-P-00683 (Grid 24 Underground Utilities), 22D-5500-P-00685 (Grid 25 Underground Utilities), and 22A-5500-P-00805 (Grid 31B Underground Utilities)). Water discharged into this storm sewer line drains to Paddy's Run via catch basin CB297 and Pilot Plant Outfall Ditch. During remediation, discharge from this area will be rerouted to the former Lime Sludge Ponds excavation. This will be done by installing a catch basin (CB 362) at the southern end of the excavation, installing a 12-inch HDPE pipe under the Impacted Material Haul Road, installing a 24-inch HDPE pipe under 2nd Street, plugging an existing 30-inch HDPE pipe, and installing an earthern berm directly in front of the existing 18-inch HDPE storm sewer line (see drawing 99X-5500-G-00783). During excavation, water will be collected within the excavation and pumped to catch basin CB 362 to drain into the former Lime Sludge Ponds excavation.

Nearing the end of excavation, two ditches will be constructed around the perimeter of the excavation: one adjacent to the Impacted Material Haul Road and the other adjacent to the Silos Rail Spur. Both ditches will drain into the catch basin CB 362 for discharge into the former Lime Sludge Ponds excavation. The ditches will prevent runoff from adjacent areas from entering the remediation area during and after the precertification process. The area to be certified will pond water and overflow into

the ditches, discharging into CB 362 to drain into the former Lime Sludge Ponds excavation. Drainage is being designed so that water from non-certified areas will not back flow into the certification area.

Under the FCP's construction activity inspection program (see section 4.3), the former Lime Sludge Ponds excavation will be inspected to assure that water levels within the excavation remain below the discharge elevation of the newly installed 24-inch HDPE pipe. When the water level within the excavation of the former Lime Sludge Pond area approaches the discharge elevation of the 24-inch HPDE pipe, water will be pumped out to of the excavation until the elevation is significantly below the pipe discharge elevation. Prior to pumping, water within the excavation of the former Lime Sludge Ponds will be sampled for total uranium. If the concentration is equal to or exceeds 30 ppb total uranium, the water will be pumped into an existing 6-inch stand pipe located near the southeast corner of the former Lime Sludge Ponds to discharge into the existing site storm sewer system and drain into the SWRB for subsequent AWWT Phase I treatment. If the concentration is less than 30 ppb total uranium, the water will be pumped for discharge to Paddy's Run via the Pilot Plant Drainage Ditch and NPDES Storm Water Outfall 4005.

After precertification samples have been obtained and a vegetative cover has been established over the majority of the remediation area, the earthern berm directly in front of the existing 18-inch HDPE storm sewer line will be removed to allow water collected within the remediated area to discharged to Paddy's Run via catch basin CB297, the OU4 Retention Basin, and Pilot Plant Outfall Ditch.

3.3 SOIL EXCAVATION

Excavation in the OU1 Stockpile Area will be performed using an excavator, bulldozer, and haul trucks; although, scrapers may be used to perform excavation within the remediation area. Generally, a bulldozer will push soil to a common load out point where the excavator will load the material into articulated haul trucks for "dirty" haul and direct placement in the OSDF. If scrapers are used for excavation, excavated material will be directly hauled to the OSDF for placement. A water truck will be used to support dust control during loading and excavation. The excavation will generally occur from south to north to enhance the collection of storm water in the southern portion of the excavation, and to drive the excavation towards the vehicle entry point. Above-WAC material present in the OU1 Stockpile Area will be excavated first and hauled to an approved above-WAC stockpile for subsequent shipment to an off-site permitted disposal facility.

The haul routes for the excavations of both the OU1 Stockpile Area and the Waste Pit #4 stockpiled cap material will go through the vehicle entry point, north on the Impacted Material Haul Road to the OSDF.

Two monitoring wells exist in the middle of the OU1 stockpile area and are used in the long-term ground water monitoring program at the site. The ground water monitoring program needs these monitoring wells to remain in service after the remediation of the OU1 stockpile area. During remediation, these monitoring wells will be protected and the soil immediately adjacent to the wells will remain undisturbed. After excavation has been completed within the general area surrounding the monitoring wells, a drilling subcontractor will be brought in to lower the wells to the new grade. This will include the removal of the outer casing and concrete pad of each well, the excavation of the undisturbed soil down to design grade, and the installation of a new casing and concrete pad to protect each well. Once the certification process begins, access to the wells will be performed on foot.

The excavation of soils from the OU1 Stockpile Area needs to occur in the Fall of 2003 to support placement of the protective layer in OSDF Cell 6 liner and the selective layer under OSDF Cap 3.

3.4 AT- AND BELOW- GRADE STRUCTURES

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. At- and below-grade structures to be removed from the OU1 Stockpile Area are limited to the soil stockpile conveyor foundations and associated hopper and stair pads. These reinforced concrete structures are located within 4 feet of existing grade account for approximately 50 bank cubic yards of debris. Concrete debris transported to the OSDF will be sized to meet physical WAC for the OSDF (DOE 2001a).

3.5 PROHIBITED MATERIALS

Section 3.3.2.2 of the SEP identifies special materials that, when encountered, require WAO input before the contractor can determine their disposition. Materials from this list may be encountered in the OU1 Stockpile Area include:

- Asbestos
- Drums and tanks
- Piping and pumps
- Process residues
- Uranium metal

- Miscellaneous debris
- Acid brick.

If not specifically prohibited from OSDF disposition, these materials can be placed in the OSDF if they meet the physical and chemical WAC, and if a visual inspection of pipe interiors is passed. Materials that do not meet the OSDF WAC will be placed in an approved above-WAC stockpile or packaged into containers and placed at the SMTA. In general, all special materials that exceed the OSDF WAC, except process residues and uranium metal, will be hauled to an approved above-WAC stockpile. Process residues and uranium metal will be containerized and placed at the SMTA. Fluor Fernald Waste Generator Services will retrieve the 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 (Section 3.6 and Appendix F).

3.6 HWMU/UST CLOSURE AND CERTIFICATION

There are no hazardous waste management units or underground storage tanks associated with the OU1 Stockpile Area.

3.7 INTERIM RESTORATION

At the end of excavation, the OU1 Stockpile Area will be graded to pond water near the southern end of the area. The area will be seeded using a permanent seed mix (wet seed mix near in and around the pond area, and dry seed mix elsewhere). Once a vegetative cover has been established over the majority of the remediation area, the earthern berm directly in front of the existing 18-inch HDPE storm sewer line will be removed to allow water to discharged to Paddy's Run via catch basin CB297, the OU4 Retention Basin, and Pilot Plant Outfall Ditch. It assumed that a vegetative cover will not be completely established until sometime in calendar year 2004.

3.8 OU1 ROD AMENDMENT

The Final Record of Decision for Remedial Actions at Operable Unit 1 (DOE 1995a), states the following:

"The Operable Unit 1 remedy consists of the following key components:

- Off-site shipment of waste for disposal at a permitted commercial waste disposal facility. It is...
- Disposition of remaining Operable Unit 1 residual contaminated soils, as amenable, consistent with selected remedies for contaminated process area soils as documented in the Operable Unit 5

Record of Decision. Any materials not consistent with the Operable Unit 5 remedy will be disposed as waste pit materials (i.e., shipped off-site)..."

Characterization has been completed on the Waste Pit #4 cap material (see the WPRAP Waste Pit 4 Cap Excavation Implementation Plan) (DOE 2002b). The material meets both the OSDF chemical and physical WAC requirements and is consistent with selected remedies for contaminated process area soils as documented in the Operable Unit 5 Record of Decision (DOE 1996b). However, the material cannot be disposed in the OSDF until the OU1 ROD is amended accordingly.

Currently, WPRAP has an effort underway to amend the OU1 ROD. This amendment effort includes several issues, including the Waste Pit #4 cap material. Therefore, no attempt to amend the OU1 ROD will be made through this document.

3.9 PRECERTIFICATION

Precertification will be performed in accordance with the Project Specific Plan for General Characterization for Sitewide Soil Remediation (DOE 2003d). Precertification activities will commence after the design grade has been reached, the perimeter ditches have been established, monitoring wells 2010 and 4010 have been lowered, and all other construction in the area is complete.
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 FRL goals.

A CDL/PSP for certification of Area 6 will be submitted to the regulatory agencies for review and approval (refer to Table 6-3 for the schedule). After precertification activities are completed, certification samples will be collected in preparation of the Area 6 CDL.

Section 4

4.0 PROJECT-SPECIFIC ENVIRONMENTAL CONTROLS AND MONITORING

This section defines the project-specific environmental controls and monitoring that will be performed during remediation of OU1 Stockpile Area, 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., endangered species, wetlands, and cultural resources). The general sitewide controls and monitoring are discussed in Section 5.0 of the SEP.

The IEMP (DOE 2003a) quarterly reporting cycles provide a link between the individual, project-specific remediation actions across the entire FCP site. Information provided to the IEMP report by the project may include improvements to the surface-water management system, the location of additional air monitors, or newly identified groundwater pathways. Normally, routine decisions made by the SDFP 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.

4.1 NATURAL RESOURCE IMPACTS

On-property natural resource impacts include those associated with 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.

The first component has been addressed in the OU3 and OU5 RODs. Small area wetlands impact are part of the 10 acres, impacted in the OU5 ROD. Mitigation of the impacted wetland is described in Section 1.5.3.2. There are no endangered species, or cultural resources identified within OU1 Stockpile Area, and all access points, staging areas, and equipment laydown areas are outside Priority Natural Resource Areas identified on Figure 5-2 in the SEP. Therefore, the second component is not applicable to OU1 Stockpile Area at this time. In the event cultural resources are discovered contingency plans will be developed to deal with the discovery per the intent of component two. Natural resource restoration (third component) is briefly described in Section 1.5.3 and is the subject of the NRRP.

4.2 AIR PATHWAY

This subsection presents the control and monitoring requirements for the air pathway during remediation of OU1 Stockpile Area. The air pathway includes noise, fugitive emissions (visible dust), airborne radiological particulates and radon, and direct radiation. Air pathway monitoring activities, to the maximum extent possible, will make use of both the existing FCP occupational air monitoring program and the sitewide environmental monitoring program (described in Section 6.0 of the IEMP). 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, in accordance with Fugitive Dust Control Requirements (RM-0047), will be implemented during OU1 Stockpile Area remediation activities to mitigate potential emissions of fugitive dust and airborne radiological particles.

4.2.1 Noise

Noise control and abatement during the OU1 Stockpile Area remediation 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 the 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 5.0 of this plan). This administrative action 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 of OU1 Stockpile Area 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 6.6, 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.

4.2.2 Fugitive Emissions

Water, commercially available dust suppression agents, or other appropriate methods and proactive work practices will be used to minimize dust generation during OU1 Stockpile Area 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 limited so that they do not result in 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-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.

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, visual monitoring will be conducted in accordance with 40 CFR Part 60, Appendix A, Method 22, Visual Determination of Fugitive Emissions from Material Sources and Smoke Emission from Flares. 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).

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 6.6, daily information that will be recorded as part of the OU1 Stockpile Area 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)

- 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.

Dust suppression agents shall not include petroleum products, lignosulfate, or chloride products.

4.2.3 Airborne Radiological Particles

Airborne radiological particles associated with OU1 Stockpile Area remediation activities are anticipated to be from fugitive emissions. Control mechanisms for fugitive emissions are presented in Section 4.2.2, and these mechanisms provide sufficient control to alleviate environmental and public safety concerns arising from OU1 Stockpile Area soil remediation activities.

Airborne radiological particles associated with OU1 Stockpile Area remediation activities will be monitored via the sitewide airborne particulate monitoring program presented in Section 6.0 of the IEMP. The IEMP monitoring network surrounds the FCP site and encompasses all the current and expected diffuse and point sources at the FCP. Data collected under the IEMP particulate monitoring program will be used to assess the collective effect of concurrent remediation activities at the FCP site, per regulatory drivers described in Section 6.0 of the IEMP.

Supplements or modifications to the IEMP monitoring program are not anticipated to be required as a result of OU1 Stockpile Area soil remediation activities. Monitoring stations surround the FCP 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 OU1 Stockpile Area.

4.2.4 Radon

Emission of radon from soil being remediated under the OU1 Stockpile Area project is not anticipated to be an environmental or public safety concern. Hence, no project-specific radon control mechanisms are needed for OU1 Stockpile Area 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 OU1 Stockpile Area soil remediation activities. Radon monitoring stations surround the FCP site and will not be relocated for OU1 Stockpile Area soil remediation activities.

4.2.5 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 OU1 Stockpile Area soil remediation activities. Environmental radiation levels associated with OU1 Stockpile Area 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 to be needed for OU1 Stockpile Area soil remediation activities, and monitoring stations will not be relocated from their present positions.

4.3 SURFACE WATER PATHWAY

As a condition of its NPDES permit (Ohio EPA Permit No. 1IQ0000*GD), the FCP was required to develop and implement a SWPPP (Stormwater Pollution Prevention Plan). The SWPPP identifies potential sources of pollution associated with construction and industrial activities that may affect storm water quality at the facility and describes the practices that will be employed 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 FCP NPDES permit.

Once stormwater controls are installed, run off from the OU1 Stockpile Area will drain into the former Lime Sludge Ponds excavation where the water will either infiltrate into the ground, evaporate, be pumped into the storm sewer system for AWWT Phase I treatment (if U > 30 ppb) or be discharged to Paddys Run (if U < 30 ppb). Once soil remediation activities begin in OU1 Stockpile Area, surface water runoff and perched groundwater that seeps into the excavation will be managed in accordance with Section 3.0.

The SWPPP mandates that construction activity inspections will be conducted in the remediation area on a weekly basis. The FCP's construction activity inspection program performs weekly inspections within all site construction areas and after any rain events totaling 0.5 inches 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 OU1 Stockpile Area project will ensure that:

- Storm water 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

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 OU1 Stockpile Area Project are discussed in Section 3.5.1.

4.4 GROUNDWATER PATHWAY

In OU1 Stockpile Area, water moving from the surface down to the GMA must move through or over the glacial overburden. The perched water table in the glacial overburden follows topography and slopes west-southwest beneath OU1 Stockpile Area at a gradient between 0.008 and 0.015 (i.e., dropping 8 to 15 feet per 1,000 horizontal feet as one traverses to the southwest). The overall vertical hydraulic gradient through the glacial overburden is 1, because unsaturated conditions are present at the base of the overburden. The water table of the GMA slopes to the east, southeast and south towards the Great Miami River.

Strategic control mechanisms to protect the GMA are outlined in Section 5.1.4 of the SEP. Since the depth of the excavation in the OU1 Stockpile Area will be shallow and will not encroach upon the GMA, no groundwater pathway concerns should exist.

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.

5.0 PROJECT-SPECIFIC HEALTH AND SAFETY

All FCP employees, visitors, vendors, and contractors associated with remedial activities in OU1 Stockpile Area are required to abide by:

- The applicable project-specific CT Package, and
- Site work permits.

In addition to the contract requirements, CTs, permits, and the requirements of this document, the contractor will comply with all federal, state, and local requirements (e.g., OSHA). Fluor Fernald managers and supervisors are responsible for ensuring that the Safe Work Plan complies with the environmental safety and health/training requirements and ensuring compliance with the Safe Work Plan. All personnel have stop-work authority for imminent safety hazards resulting from noncompliance with the applicable health and safety practices. Health and safety requirements and procedures for this Implementation Plan will be governed by the OU1 Stockpile Area CT, site work permits, contractor's Safe Work Plans and the overall strategy discussed in the SEP (Section 6.0).

In accordance with procedure SH-0001, Developing Project Specific Health and Safety Requirements, or an equivalent procedure, a CT will be developed for construction, excavation, and impacted material placement activities related to OU1 Stockpile Area. This applicable CT will be included in the solicitation packages to provide information on possible safety hazards and training associated with each task. The contractor will use this information to develop Safe Work Plans. The contractor will incorporate their occupational exposure monitoring requirements into their Safe Work Plan. These strategies will address COCs for the OU1 Stockpile Area project area and will comply with all federal, state, and local requirements (e.g., OSHA, ACGIH).

The contractor's Safe Work Plan may be revised, as tasks and/or associated hazards are identified, added, or deleted. The CT, as well as the detailed Work Plans, will be maintained at the project site, with controlled copies in the project document control files.

An occupational health and safety representative will review all project design documents and ensure compliance with all applicable worker safety and health regulations. Fluor Fernald will provide all radiological occupational monitoring for the contractor, including Radiological Control Technicians (RCTs) to support remediation activities. The contractual radiological work requirements for OU1 Stockpile Area remediation activities will be detailed in activity-specific Radiological Work

Permits RWPs) and Chemical Hazard Permits (CHPs). Personnel performing work under a RWP or CHP 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. Survey results will be forwarded from Fluor Fernald to the contractors.

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

Section 6

6.0 REMEDIAL ACTION MANAGEMENT STRATEGY

This section describes the following management activities for the remediation of OU1 Stockpile Area: organization and responsibilities, configuration management, construction management, impacted material management, contingency management, data and records management, QA/QC and regulatory audit, integration of OU1 Stockpile Area activities with other SDFP and FCP activities, and remedial action and certification schedule.

6.1 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-FCP Remedial Action Project Manager is responsible for ensuring that FCP remedial actions meet project goals, standards, specifications and requirements, while the DOE OU5 Team Leader provides DOE-FCP programmatic direction for at- and below-grade remediation of OU1 Stockpile Area. DOE-FCP will assign a Facility Representative to conduct field oversight of the project through Technical Leads that will be responsible for construction, excavation/remediation, engineering, QA/QC, health and safety, environmental controls and monitoring, and other pertinent aspects of the project. The DOE-FCP 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 FCP. Remedial activities will be performed by the OU1 Stockpile Area Project Team, which will consist of personnel working for DOE's primary contractor. The OU1 Stockpile Area Project Team consists of personnel in SDFP, supported by other FCP 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 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 Construction Manager. This organizational structure provides clear lines of responsibility and experienced leadership to the appropriate technical phases of the project.

The OU1 Stockpile Area Project Team includes personnel in the following groups:

- 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 FCP projects are discussed in Section 6.8.

6.1.1 Management

OU1 Stockpile Area management includes the SDFP Project Director, Deputy Director, Engineering/Planning Manager, Construction Manager, and administrative support. Each of these positions is discussed below, and many of the positions are described in greater detail in FCP procedures and project documents.

6.1.1.1 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 Construction 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.

6.1.1.2 Engineering/Planning Manager and Construction Manager

The Engineering/Planning Manager and Construction Manager oversee and manage the project and 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 which includes his direct reports from Engineering, Restoration

Management, Characterization/Waste Management, and Real-Time Instrumentation Measurement Program (RTIMP). Also, support is provided from other SDFP support personnel from QA/QC, project controls, administration, safety and health, radiological control, surveying, and construction. During construction, the overall project is managed by the Construction Manager and his direct reports including construction superintendents, construction engineers, labor support, logistical support, safety and health, and radiological control. He is also supported by the Engineering/Planning Manager and his 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 Management Lead, RTIMP Lead, and other SDFP resources to provide timely and sufficient technical support per the Execution Manager's request during construction
- Facilitating implementation of FCP 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 Construction Manager is in charge of, and accountable for, OU1 Area 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 FCP permits and ensuring permit requirements are fully understood and followed by field personnel
- Facilitating timely and sufficient implementation of FCP oversight functions (e.g., QA/QC, Safety and Health, 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.

6.1.1.3 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.

6.1.1.4 Project Controls

The Project Controls group provides the Project Director, Engineering/Planning Manager, and Construction 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.

6.1.2 Primary Technical Areas

The primary technical areas that support soil remediation in OU1 Stockpile Area are:

- Engineering
- Construction
- Characterization.

6.1.2.1 Engineering

The SDFP Engineering staff (engineering staff) under SDFP Engineering Manager (Engineering Manager) direction performs Title I and II design and engineering services by creating CFC design drawings and technical specifications. The engineering staff also prepares specific sections of the Implementation Plan and provides 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 which include processing Requests for Clarification or Information (RCIs) and creating and/or processing 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 "Certified for Construction" drawings and technical specifications when necessary
- Reviewing and approving "as-built drawings" supplied by the construction manager 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
- Requesting a safety assessment be prepared to govern the remediation effort
- Assuring that safety is incorporated into the design.

6.1.2.2 Construction

Under the lead of the CM, remedial action construction will be performed by building trades labor and/or the construction support contractor reporting directly to SDFP construction management personnel. The CM has Construction Superintendents, Construction Engineers, Construction Coordinators, Logistical Support, Surveying/CADD, and Labor Support personnel on staff to support these activities. Specific responsibilities include:

- Managing the building trades labor force to self perform the OU1 Stockpile Area 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
- Assuring that regulatory commitments are meet and fulfilled and that work is performed in accordance with regulatory requirements
- Installing storm water controls

Construction field personnel will be qualified to supervise the performance of tasks associated with the OU1 Areas remedial activities. They are responsible for coordinating and supervising their work as well as any subcontractor work in OU1 Stockpile Area. At a minimum, Construction's representatives will be responsible for the following:

- Implementing a safety program in accordance with FCP requirements
- Discussing and interpreting the OU1 Stockpile Area 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 OU1 Stockpile Area activities and assisting the Execution Manager or his designated representative in reviewing and approving submittals, as necessary
- Implementing and verifying QC procedures required of the contractor and/or their subcontractors
- Assuring that construction activities are conducted in a safe manner.

6.1.2.3 Characterization

The Characterization/Waste Management Lead (Characterization Lead) will coordinate OU1 Stockpile Area field measurements, sample collection, laboratory analyses, and data management associated with the characterization of waste materials and soil in OU1 Stockpile Area. 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
- Identifying areas of known contamination that will require issuance of chemical hazard permits prior to remedial work being performed in that area.
- Reporting precertification and certification sampling/measurements.

The Characterization Lead will oversee sampling and analytical activities that support the remedial design and certification of OU1 Stockpile Area. 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 Lead. 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 Lead and support personnel.

6.1.3 Functional Support

The OU1 Stockpile Area Project will require support from personnel in other FCP 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, Safety and Health, etc).

6.1.3.1 Safety and Health

Safety and Health support during the project will be provided by the Safety and Health Lead and his direct reports. This support will include:

- Preparing Safety and Health documents for the project
- Assist in preparing traveler packages, permits, Job Safety Analysis, and other like documents
- Reviewing documents as they are prepared for compliance with Safety and Health requirements
- Implementing the OU1 Stockpile Area Project-Specific Health and Safety Plan, as required
- Assuring that FCP personnel and contractors follow safe work practices.

Health and Safety personnel and any other employee have stop-work authority if unsafe conditions or acts are observed.

6.1.3.2 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.

6.1.3.3 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.

6.1.3.4 Quality Assurance/Quality Control

The SDFP QA/QC Lead and his direct reports (QA/QC representatives) will be matrixed to the project from the FCP QC Operations organization and the QA/QC Lead will report to the Project Director in an administrative fashion, while retaining an independent oversight role. The QA/QC Lead 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 FCP 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.

6.1.3.5 Waste Disposition

A FCP 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 Construction Manager and the Waste Management Manager for handling and disposition of waste streams.

6.1.3.6 Natural Resources

Personnel within the Natural Resources organization will be responsible for assessing potential damages to natural resources within OU1 Stockpile Area 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 OU1 Stockpile Area as described in the NRRP. Natural resources and environmental monitoring personnel will monitor impacts to natural resources, as covered under the IEMP, and ensure reporting of those impacts is integrated with the Site Environmental Report (DOE 2003c).

6.1.3.7 Cultural Resources

Cultural Resources will be responsible for handling unexpected discoveries of cultural resources during site preparation and excavation in OU1 Stockpile Area. Any cultural resources encountered will be handled in accordance with Section 6.5.3.

6.1.3.8 Procurement

FCP Procurement will assist the OU1 Stockpile Area 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.

6.1.4 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 Health and Safety 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.

6.1.4.1 Visual Observation

The active face of excavations will be monitored visually and continuously to identify special materials encountered during excavation. WAO and Construction personnel will monitor the excavation face. Special materials that are likely to 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.

6.1.4.2 Sampling and Monitoring

Physical sampling and/or Radiation Scanning System (RSS)/Radiation Tracking System (RTRAK) or HPGe monitoring will be performed as necessary during excavation of OU1 Stockpile Area. In general, RSS/RTRAK or HPGe monitoring will be conducted after each excavation lift in areas known to contain soil above the OSDF 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 Lead.

6.1.4.3 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 6.3.4.

6.1.4.4 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.

6.1.4.5 Material Documentation

A WAO representative will complete the OSDF Manifest and FTL to document the transfer of material from OU1 Stockpile Area to the OSDF or other MTLs. Trucks hauling to the OSDF from OU1 Stockpile Area 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.

6.1.4.6 Occupational Health and Safety

FCP Safety and Health will be responsible to monitor the work area for occupational health and safety concerns that include: occupational dust, compliance with the CT Package, chemical exposure, other hazards, and changes in field conditions affecting worker safety. FCP Safety and Health will periodically observe health and safety conditions at the active excavation area. Additional monitoring information is discussed in Section 6.3.3.

6.1.4.7 Construction Monitoring

FCP Construction will direct and monitor the remediation work for compliance with the CFC documents. One full-time FCP construction person will be assigned to OU1 Stockpile Area field activities and additional part-time personnel will be assigned on a periodic basis. Other surveillance and inspection responsibilities are discussed in Section 6.3.2.

6.1.4.8 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.

6.1.4.9 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.

6.1.4.10 Environmental Monitoring

Environmental monitoring will be done on a regular basis by FCP personnel. 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.

6.1.4.11 Safety Inspections

The Construction Manager or his designated representative will lead a weekly joint safety inspection of the work area. Participants will include Safety and Health representatives. Additional Safety and Health oversight functions are discussed in Section 6.3.3.

6.1.5 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 excavation materials and 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, Safety and Health, project management, etc). However, only personnel who are directly involved with or need to work immediately adjacent to the active construction area will be allowed within 50 feet of the active excavation.

6.1.6 Management of Field Personnel

The potentially large group of personnel at a single excavation site at any given time creates logistical and safety concerns. Therefore, the responsibility for the management and coordination of field personnel and activities has been assigned to Construction. Personnel needing access to the excavation site will sign in with Construction before entering the excavation area and sign out upon leaving the area. This type of administrative control provides Construction with information on the number of people in a given area at any time, which is critical information needed in the event of an emergency.

6.2 CONFIGURATION MANAGEMENT

Configuration management will not be implemented on the OU1 Stockpile Area project since it does not apply to Performance Grade 4 and 5 facilities.

6.3 CONSTRUCTION MANAGEMENT

Fluor Fernald Construction (Construction) is responsible for implementing 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, using the site construction support contractor where appropriate. In addition, Construction will be responsible for construction management during the work. 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 Construction Manager or his designated representative will ensure that safety concerns are brought to the attention of the FCP Safety and Health Officer and the responsible Construction team members to ensure timely resolution of the concerns.

6.3.1 Status Meetings

The Construction Manager, or his designated representative, 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 FCP project file.

6.3.2 Surveillance and Inspection

Construction supervision has first line responsibility to inspect work and correct any deficiencies. The Construction Manager, Engineering/Planning Manager or their designated representative(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.

6.3.3 Safety and Health Oversight

The SDFP Safety and Health Lead, or his designated representative, will perform safety oversight of the OU1 Stockpile Area construction. While FCP personnel are responsible for following safety requirements identified in the Traveler Package, as appropriate, the assigned OU1 Stockpile Area Safety and Health representative will perform periodic surveillance of the OU1 Stockpile Area remedial action to monitor compliance. Although project personnel have stop-work authority for imminent safety hazards, the Safety and Health 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 Safety and Health representative will be the single point of contact for safety, industrial hygiene, and fire protection issues. The Radiological Engineer is responsible for radiological concerns. Health and safety issues and concerns will be directed to the Construction Manager for resolution/implementation.

6.3.4 Radiological Monitoring and Oversight

To ensure occupational radiological compliance, FCP RCTs will be assigned to the OU1 Stockpile Area project. The assigned RCTs will perform the necessary radiological monitoring and oversight to provide documentation that demonstrates project compliance with regulatory occupational exposure control requirements. The OU1 Stockpile Area CT Package 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.

6.4 IMPACTED MATERIAL MANAGEMENT

Impacted materials generated during OU1 Stockpile Area remediation will be managed under the FCP 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 health and safety 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 are 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. Prior to 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 into 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 (humus and 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.

6.5 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.

6.5.1 Materials Which Require Special Handling

Special materials, and the protocol for their handling, are given in Appendix F of the SEP and procedure EW-1024. The special materials that are likely to be encountered during OU1 Area 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 FCP 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.

6.5.2 Unexpected Contamination or Soil Conditions

In accordance with the SEP, the FCP 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 6-1 addresses the specific situations relative to discovery of unknown underground utilities and unexpected above-WAC material.

6.5.3 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. The 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.

6.6 DATA AND RECORDS MANAGEMENT

Management of data and records for OU1 Stockpile Area remediation will be in general accord with the strategy and protocols as described in Section 3.6 of the SEP and the QA protocols for data management activities described in Appendix E of the SEP. The primary documents that will be generated during OU1 Stockpile Area remediation, and the files in which they will be maintained, are identified in Table 6-2.

6.7 QA/QC AND REGULATORY AUDIT

OU1 Stockpile Area project activities may be assessed to verify compliance to program requirements specified in this Implementation Plan. The assessment may 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 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 Lead 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 FCP will also be coordinated with the SDFP QA/QC Lead. Construction will be responsible for documenting field inspections, nonconformance identification, and corrective actions in a timely and controlled manner.

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

FCP procurement requisitions are reviewed and signed by the SDFP QA/QC Lead. The Area 3B/4B/5 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.

6.8 INTEGRATION OF OU1 STOCKPILE AREA PROJECT WITH OTHER SDFP AND FCP ACTIVITIES

OU1 Stockpile Area remediation activities are planned and conducted in cooperation with other SDFP and FCP remediation projects and activities to ensure effective and efficient attainment of project-specific and sitewide remediation objectives. The integration with FCP support groups is established through functional support representatives that are integral members of the OU1 Stockpile Area Project Team (e.g., environmental compliance, natural and cultural resource management, sampling and analysis, QA, construction management). As noted in Section 6.1, 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 FCP organizations not directly represented on the OU1 Stockpile Area Project Team include the following:

- Sitewide Planning and Scheduling
  - Integrating the OU1 Stockpile Area plan and schedule with the FCP master schedule
- OSDF Project
  - Planning and scheduling activities to ensure timely placement of OU1 Stockpile Area impacted material into the OSDF in accordance with the Impacted Materials Placement Plan and other pertinent requirements
- Demolition Projects
  - Coordinating above-grade demolition of OU1 Stockpile Area component (Soil Handling Conveyor) with at- and below-grade remediation of this structure 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
- Site Utilities
  - Coordinating as necessary to remove, replace, or relocate other utilities
- WAO
  - WAO, an FCP 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.

6.9 REMEDIAL ACTION AND CERTIFICATION SCHEDULE

In accordance with the Amended Consent Agreement, this Implementation Plan identifies OU1 Stockpile Area project-specific milestones for remedial actions and certification activities (Table 6-3). These milestones are subject to enforceable deadlines by EPA and OEPA.

TABLE 6-1

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.

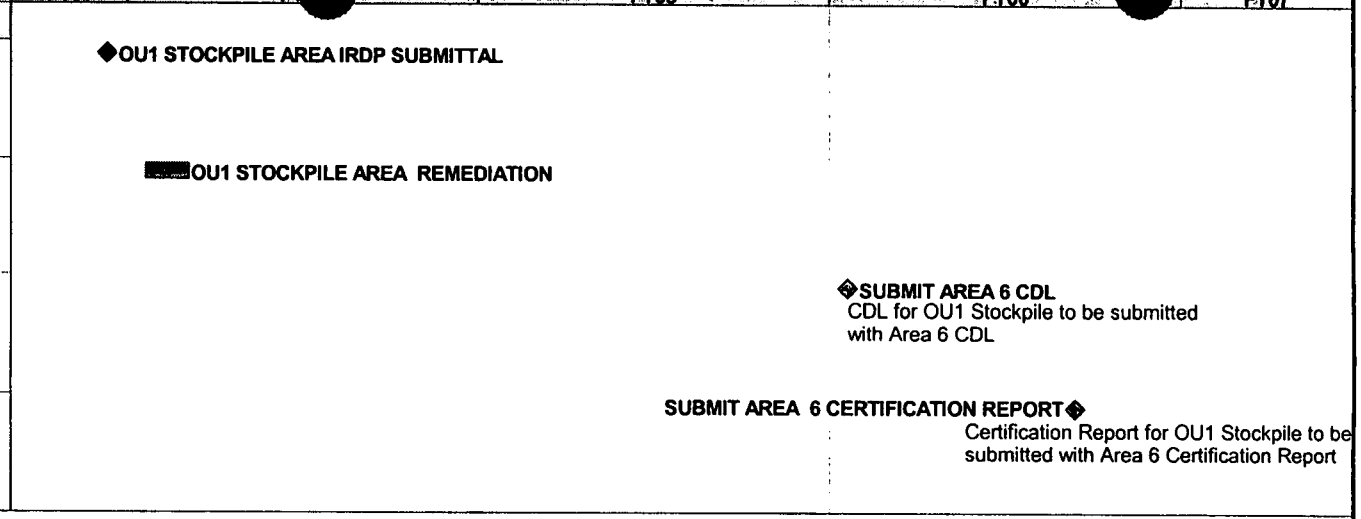
TABLE 6-2

OU1 STOCKPILE AREA 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 Site Operating Record
Containerized Impacted Material Documents	IIMS SWIFTS Component Site Operating Record
Analytical Data and Associated Field Logs	IIMS SED Component Site Operating Record

GIS = Geographic Information System

Activity Description	Orig Dur	Early Start	Early Finish
AREA 6			
OU1 STOCKPILE AREA IRDP SUBMITTAL	0		09SEP03*
OU1 STOCKPILE AREA REMEDIATION	30	20OCT03*	03DEC03
SUBMIT AREA 6 CDL	0		18OCT05*
SUBMIT AREA 6 CERTIFICATION REPORT	0		12JUN06*



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Fluor Fernald	Start Date 02SEP02 Finish Date 12JUN06 Data Date 02SEP02 Run Date 28AUG03 08:15	EPA1 Sheet 1 of 1 **FLUOR FERNALD OU1 STOCKPILE AREA REMEDIATION TABLE 6-3**	Early Bar Progress Bar Critical Activity

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Fluor Fernald

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, 1995a, "Record of Decision for Remedial Actions at Operable Unit 1," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1995b, "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, 1997, "Programmatic Agreement Among the U.S. Department of Energy, Fernald Office, the Advisory Council on Historic Preservation, and the Ohio Historic Preservation Office Regarding Archeological Investigations at the Fernald Environmental Management Project," March 6, 1997, 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, 2002a, "Implementation Plan for Area 2, Phase I Non-Waste Units Perimeter Areas," Final, Revision 0, Fernald Area Office, Cincinnati, Ohio.

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

U.S. Department of Energy, 2003a, "Integrated Environmental Monitoring Plan," Final, Rev. 3, Fernald Closure Project, DOE, Cincinnati, Ohio.

U.S. Department of Energy, 2003b, "Project Specific Plan for Predesign Sampling in Area 6 SP-7/OU1 Stock Pile Area, " Final, Fernald Closure Project, DOE, Cincinnati, Ohio.

U.S. Department of Energy, 2003c, "Site Environmental Report," Final, Fernald Closure Project, DOE, Cincinnati, Ohio.

U.S. Department of Energy, 2003d, "project Specific Plan for General Characterization for Sitewide Soil Remediation," Final, Fernald Closure Project, DOE, 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

APPENDIX A

DESIGN CRITERIA PACKAGE

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

FERNALD CLOSURE PROJECT
FERNALD, OHIO

JULY 28, 2003

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

20201-DC-0001
REVISION 4
PCN 1

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

20201-DC-0001
Revision 4

March 5, 2003

APPROVALS:

3/5/03
Date

Dave Russell, Project Engineer
Soil and Disposal Facility Project

FOR ANTHONY SNIDER
3/5/03
Date

Anthony Snider, Lead Project Engineer
Soil and Disposal Facility Project

3/5/03
Date

Jyh-Dong Chiou, Program Manager
Soil and Disposal Facility Project

REVISION SUMMARY

Revision	Date	Description of Revision
Rev. 0	3-10-99	Initial issuance of the Design Criteria Package for the At- and Below-Grade Remediation of the Former Plant Area
Rev. 1	1-26-00	Refined approval page and revised Figure 5-1. Revised design storm and water release requirements for surface water management. Clarified perched water management narrative.
Rev. 2	3-31-00	Added Revision Summary page, renamed Figure 5-1 and added Figure 5-2. Noted characterization criteria for 3-D computer excavation model. 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	3-01	Added title of Rainwater and Land Development in Sections 4.0 and 5.4. Deleted references to Water Management Facility and Biodenitrification Surge Lagoon. Clarified disposition of VOC-contaminated water. Clarified disposition of surface water from certified area and revised traffic requirements.
Rev. 4A	6-02	Revised Approval page, replaced Figure 5-1 and deleted Figure 5-2. 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. Added new Section 5.1 for Utility Isolation Requirements to correlate with list detailed in Section 5.0 and renumbered sections accordingly. Added alternative to pump water requiring AWWT Phase II treatment through temporary HDPE piping.
Rev. 4	3-5-03	In response to agency comment made against SWL/FTF IRDP, revised excavation slope requirements to be consistent with those stated in the technical specifications. Incorporated MDC in excavation sequencing. Softened the requirement for a Surface Water Management Plan. Clarified isolation trenching requirements to include the new Area 3B/4B trench.
PCN 1	7-28-03	Per Ohio EPA request, Table A-2 on Page A2 of A74 was revised to reflect the 1999 capture of one Indiana Bat

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
FCP	Fernald Closure Project
FRL	final remediation level
FTF	Fire Training Facility
GMA	Great Miami Aquifer
gpm	gallons per minute
HWMU	hazardous waste management unit
IRDP	Integrated Remedial Design Package
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

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 Closure Project (FCP). 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.

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 FCP 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 FCP 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 Wastewater Treatment (AWWT) Facility will be addressed during design. Similar technical approaches to stormwater runon/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 FCP 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 (refer to 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 1IO0000*FD, March 1, 2000
- Functional Requirements Document for the Former Plant Area, 20300-PL-0003, Revision 2, February 2002
- Advanced Conceptual Design, 20201-PL-0002, Revision 0, May 24, 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:

- Isolation Trenching
- Excavation
- 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
- Restoration.

5.1 Isolation Trenching Requirements

Undocumented below-grade utilities are defined as utility lines that are not shown on current master utility grid plans. Prior to full-scale FRL excavation activities, undocumented below-grade utilities in Areas 3A, 4A, and 4B will be isolated by cutting an approximate 2-foot wide by 12-foot deep area isolation trench corresponding closely to the area excavation limits. Areas 5 and 6 do not require isolation trenching due to the majority of utility feeds into the area being previously isolated by Area 3A, 4A and 3B/4B trenching. Area 2, Phase II will not require isolation trenching due to minimal risk related to undocumented below-grade utilities. The rationale for the 12-foot depth lies with providing additional assurance that utilities existing below the typical utility depth of 6-8 feet not reflected on the master underground utility grids will be severed by cutting to the maximum depth achievable by the equipment. Isolation trenching will ensure that unknown electrical utilities are disconnected near the area excavation limits. As necessary, excavation beyond the isolation trench will be performed under a penetration permit. Isolation trenching requirements will be detailed in the technical specifications and summarized below.

Known active electrical and water lines shown on FCP grid plans will be isolated before performing isolation trenching. With respect to low-voltage lines (i.e., 220V), there is a small probability that the master utility grid plans do not capture every 220V line placed over the four decades that the site was operating. Given the noise of the machine and the speed at which the cutting saw operates, the severing of a 220V line is not likely to be noticeable to field personnel. The trencher operator will be insulated from electrical hazards, and the hazard will be identified by visual inspection after the machine has passed. Although the trench will not remain open for a significant period of time, there are instances when the trench may need to be accessed to plug a sewer or utility line. For these special cases, a trench may remain open for over 24 hours, and OSHA regulations for excavating and trenching will apply.

A sequence for maintaining, using, and/or abandoning existing storm sewer lines within the excavation area may be proposed by the CM prior to isolation trenching. Storm sewer lines selected for use will be protected during trenching by raising the trench-cutting tool above the storm sewer. The CM will then explore areas around protected storm sewer lines for unknown utilities and other known utilities not cut by the trencher. Prior to cutting storm sewer lines that are to be abandoned, lines will be plugged to prevent the introduction of storm water into the severed lines.

Trenching activities will be observed at all times by the CM and WAO. Dust control will be provided, as needed, to prevent the spread of airborne contamination. The trencher operator will be inside an enclosed cab that provides ventilation through a particulate air filter. Trenching will be stopped if there is evidence of draining sanitary sewer or process lines, special materials, unknown electrical utilities, or cultural resources. When observed, leaking sanitary sewer or process lines will be plugged if the seepage has not stopped before backfilling the trench. Backfilling will occur daily using the material excavated from the trench, with the top 2 feet of backfill compacted to minimize infiltration. If the trench needs to be kept open, it will be barricaded and shored in accordance with applicable OSHA regulations. When observed, the locations where sanitary sewer or process lines drained into the trench will be recorded on redline drawings of the completed trench. Material released from a leaking sanitary sewer or process line will be excavated, along with the material placed in the trench as backfill, during remediation of the trench with the adjacent remediation area. HPGe shots will be done in areas where draining sanitary sewer or process lines were noted on redline drawings to monitor for elevated levels of contamination.

5.2 Excavation Requirements

Excavation will be performed to remove impacted material in the Former Plant Area. Excavation strategies have been set forth in the SEP. Unless otherwise designed by a registered professional engineer, the following slope stability requirements shall apply during excavation activities:

- Excavation slopes with depths less than 20-feet shall be performed in accordance with applicable Occupational Safety and Health Administration (OSHA) guidelines.
- Sloped excavations greater than 20 feet in depth shall be designed by a Professional Engineer (PE) registered in the state of Ohio.
- Temporary excavation slopes with depths less than 20-feet shall be no steeper than 1.5H:1V with a maximum height of 13 feet between 15 foot benches.
- Design slopes and slopes created by supplemental excavation shall be no steeper than 2H:1V with a maximum height of 13 feet between 15 foot benches.

These requirements are consistent with 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). Design documents for area 3A, 3B, 4A, and 4B will be developed based on a 3-D computer model of the extent of contamination. Design documents for remaining areas will be based on characterization results of physical sampling and real-time monitoring. 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 (refer to 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)

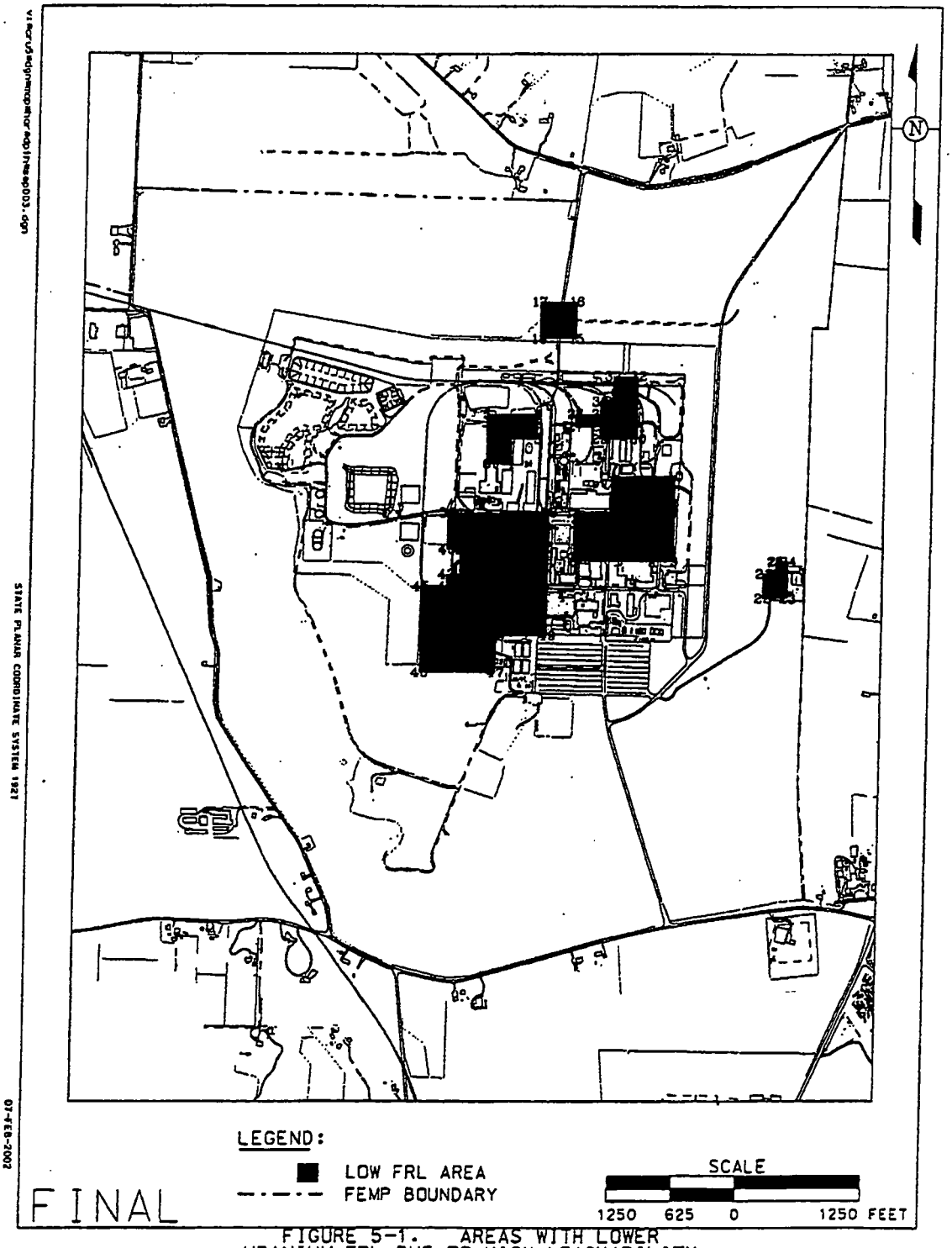

FIGURE 5-1. AREAS WITH LOWER URANIUM FRL DUE TO HIGH LEACHABILITY

- 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).
- At a minimum, gravel, asphalt, and concrete in areas altered by establishment of infrastructure facilities (i.e. trailer complex, parking lot, etc.) in Area 2, Phase II will be removed.
- 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.

5.3 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. For purposes of design and excavation sequencing, a portion of the main storm sewer drainage corridors (MDC) within the Former Production area and Administrative Area may be separated from adjacent remediation areas to be executed as it's own sub-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.

5.4 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, then the soil and any associated debris will be staged separately to await a decision by Characterization/Waste Management Department under SDFP 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.

5.5 Surface Water Management

In some cases, a Surface Water Management Plan may be developed to supplement requirements stated in the IRDP to address both stormwater and erosion and sediment control. 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
- 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.

5.6 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.

5.7 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 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.

5.8 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.

5.9 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.

5.10 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.

5.11 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.

5.12 Transportation

Traffic and transportation patterns and requirements will be developed during Title I and Title II design and coordinated with other FCP 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 SP-7, 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 SP-7, 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.

5.13 Restoration

Grading and filling will be minimized in post-excavated 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
- Excavation of contamination in the GMA sand and gravel layer
- Remediation of waste pit material in Area 6.

APPENDIX A

ARARs AND TBCs

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-A67
	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 FBMP 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 and is found 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 ORC 3734.02(I)	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. 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.	Appl ✓	Appl ✓	Appl R&A	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
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				

Citation	Requirement	OU2 ROD	OU5 ROD	OU3 ROD	Remarks	Cross-Reference
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/m²/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-Reference
	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. 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/m²/sec, as required by 40 CFR Part 61.	√	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).

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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

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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					
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

APPENDIX B

CHARACTERIZATION DATA FOR OU1 STOCKPILE AREA

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Area 6 OU1 Stockpile

SAMPLE_ID	NORTHING	EASTING	GROUND_MSL	Top	Bottom
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-P	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-P	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-L	482033.331	1348314.988	590.861	2	2.5
A6-OU1-1^5-R	482033.331	1348314.988	590.861	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-P	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-P	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-L	482010.819	1348374.942	590.962	2	2.5
A6-OU1-2^5-R	482010.819	1348374.942	590.962	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-P	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-P	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-L	482003.827	1348410.876	591.719	2	2.5
A6-OU1-3^5-R	482003.827	1348410.876	591.719	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-P	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-P	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5

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A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-L	481863.414	1348162.036	585.933	2	2.5
A6-OU1-4^5-R	481863.414	1348162.036	585.933	2	2.5
A6-OU1-5^1-R	481885.042	1348194.864	585.852	0	0.5
A6-OU1-5^1-R	481885.042	1348194.864	585.852	0	0.5
A6-OU1-5^2-R	481885.042	1348194.864	585.852	0.5	1
A6-OU1-5^2-R	481885.042	1348194.864	585.852	0.5	1
A6-OU1-6^1-R	481884.932	1348184.537	585.64	0	0.5
A6-OU1-6^1-R	481884.932	1348184.537	585.64	0	0.5
A6-OU1-7^1-R	481894.657	1348194.977	585.868	0	0.5
A6-OU1-7^1-R	481894.657	1348194.977	585.868	0	0.5
A6-OU1-8^1-R	481884.947	1348204.913	586.167	0	0.5
A6-OU1-8^1-R	481884.947	1348204.913	586.167	0	0.5
A6-OU1-9^1-R	481874.976	1348194.951	585.894	0	0.5
A6-OU1-9^1-R	481874.976	1348194.951	585.894	0	0.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-P	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-P	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-L	481863.846	1348285.553	589.519	2	2.5
A6-OU1-10^5-R	481863.846	1348285.553	589.519	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-P	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-P	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-L	481835.436	1348444.958	591.003	2	2.5
A6-OU1-11^5-R	481835.436	1348444.958	591.003	2	2.5
A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-P	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-P	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5

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A6-OU1-12^5-L	481658.314	1348090.126	584.488	2	2.5
A6-OU1-12^5-R	481658.314	1348090.126	584.488	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-P	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-P	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-L	481658.132	1348240.066	585.419	2	2.5
A6-OU1-13^5-R	481658.132	1348240.066	585.419	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-P	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-P	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-L	481431.057	1348072.872	582.611	2	2.5
A6-OU1-14^5-R	481431.057	1348072.872	582.611	2	2.5
A6-OU1-15^7-P	481430.97	1348223.055	585.665		
A6-OU1-15^11-P	481430.97	1348223.055	585.665		
A6-OU1-15^7-P	481430.97	1348223.055	585.665		
A6-OU1-15^11-P	481430.97	1348223.055	585.665		
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-P	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-P	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-L	481430.97	1348223.055	585.665	2	2.5
A6-OU1-15^5-R	481430.97	1348223.055	585.665	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-P	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-P	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5

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A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-L	481151.224	1348102.587	578.71	2	2.5
A6-OU1-16^5-R	481151.224	1348102.587	578.71	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-P	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-P	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-L	480921.159	1348092.975	576.185	2	2.5
A6-OU1-17^5-R	480921.159	1348092.975	576.185	2	2.5
A6-OU1-18^5-P	481436	1348223	585.736		
A6-OU1-18^5-P	481436	1348223	585.736		
A6-OU1-19^5-P	481431	1348228	585.022		
A6-OU1-19^5-P	481431	1348228	585.022		
A6-OU1-20^5-P	481426	1348223	585.549		
A6-OU1-20^5-P	481426	1348223	585.549		
A6-OU1-21^5-P	481431	1348218	585.945		
A6-OU1-21^5-P	481431	1348218	585.945		

Area 6 OU1 Stockpile

Parameter	FRL	Result	VQ	Units
1,1,1-Trichloroethane		1.9	UNV	µg/kg
1,1-Dichloroethene	410	1.9	UNV	µg/kg
1,2-Dichloroethene (Total)		3.81	UNV	µg/kg
Aroclor-1254	130	3.7	U	µg/kg
Aroclor-1260	130	3.7	U	µg/kg
Bromodichloromethane	4000	1.9	UNV	µg/kg
Cesium-137	1.4	0.0834	J	pCi/g
Radium-228	1.8	0.83	-	pCi/g
Technetium-99	30	1.76	U	pCi/g
Tetrachloroethene	3600	1.9	UNV	µg/kg
Thorium-228	1.7	0.835	-	pCi/g
Thorium-230	280	25.8	U	pCi/g
Thorium-232	1.5	0.83	-	pCi/g
Trichloroethene	25000	1.9	UNV	µg/kg
Uranium, Total	50	3.82	U	mg/kg
1,1,1-Trichloroethane		1.98	UNV	µg/kg
1,1-Dichloroethene	410	1.98	UNV	µg/kg
1,2-Dichloroethene (Total)		3.96	UNV	µg/kg
Aroclor-1254	130	3.9	U	µg/kg
Aroclor-1260	130	3.9	U	µg/kg
Bromodichloromethane	4000	1.98	UNV	µg/kg
Cesium-137	1.4	0.0761	U	pCi/g
Radium-228	1.8	0.749	-	pCi/g
Technetium-99	30	1.82	U	pCi/g
Tetrachloroethene	3600	1.98	UNV	µg/kg
Thorium-228	1.7	0.727	-	pCi/g
Thorium-230	280	16	U	pCi/g
Thorium-232	1.5	0.749	-	pCi/g
Trichloroethene	25000	1.98	UNV	µg/kg
Uranium, Total	50	2.88	U	mg/kg
1,1,1-Trichloroethane		2.2	UNV	µg/kg
1,1-Dichloroethene	410	2.2	UNV	µg/kg
1,2-Dichloroethene (Total)		4.4	UNV	µg/kg
Aroclor-1254	130	1.6	J	µg/kg
Aroclor-1260	130	4.1	UJ	µg/kg
Bromodichloromethane	4000	2.2	UNV	µg/kg
Cesium-137	1.4	0.0902	U	pCi/g
Radium-228	1.8	0.902	-	pCi/g
Technetium-99	30	1.77	U	pCi/g
Tetrachloroethene	3600	2.2	UNV	µg/kg
Thorium-228	1.7	0.899	-	pCi/g
Thorium-230	280	21.5	U	pCi/g
Thorium-232	1.5	0.902	-	pCi/g
Trichloroethene	25000	2.2	UNV	µg/kg
Uranium, Total	50	4.58	-	mg/kg
1,1,1-Trichloroethane		2.08	UNV	µg/kg
1,1-Dichloroethene	410	2.08	UNV	µg/kg
1,2-Dichloroethene (Total)		4.17	UNV	µg/kg
Aroclor-1254	130	3.7	U	µg/kg
Aroclor-1260	130	3.7	U	µg/kg
Bromodichloromethane	4000	2.08	UNV	µg/kg
Cesium-137	1.4	0.0668	U	pCi/g
Radium-228	1.8	0.752	-	pCi/g
Technetium-99	30	1.74	U	pCi/g
Tetrachloroethene	3600	2.08	UNV	µg/kg
Thorium-228	1.7	0.771	-	pCi/g
Thorium-230	280	17.2	U	pCi/g

Area 6 OU1 Stockpile

Thorium-232	1.5	0.752	-	pCi/g
Trichloroethene	25000	2.08	UNV	µg/kg
Uranium, Total	50	3.66	-	mg/kg
Technetium-99	30	4.91	-	pCi/g
Uranium, Total	50	98.4	-	mg/kg
Technetium-99	30	1.79	U	pCi/g
Uranium, Total	50	90	-	mg/kg
Technetium-99	30	1.73	U	pCi/g
Uranium, Total	50	24.7	-	mg/kg
Technetium-99	30	1.9	U	pCi/g
Uranium, Total	50	41.7	-	mg/kg
Technetium-99	30	1.93	U	pCi/g
Uranium, Total	50	24.2	-	mg/kg
Technetium-99	30	1.76	U	pCi/g
Uranium, Total	50	50.5	-	mg/kg
1,1,1-Trichloroethane		2.35	UNV	µg/kg
1,1-Dichloroethene	410	2.35	UNV	µg/kg
1,2-Dichloroethene (Total)		4.71	UNV	µg/kg
Aroclor-1254	130	20	-	µg/kg
Aroclor-1260	130	8.9	J	µg/kg
Bromodichloromethane	4000	2.35	UNV	µg/kg
Cesium-137	1.4	0.228	J	pCi/g
Radium-228	1.8	1.15	-	pCi/g
Technetium-99	30	1.83	U	pCi/g
Tetrachloroethene	3600	2.35	UNV	µg/kg
Thorium-228	1.7	1.15	-	pCi/g
Thorium-230	280	11.6	U	pCi/g
Thorium-232	1.5	1.15	-	pCi/g
Trichloroethene	25000	2.35	UNV	µg/kg
Uranium, Total	50	24.9	-	mg/kg
1,1,1-Trichloroethane		2.16	UNV	µg/kg
1,1-Dichloroethene	410	2.16	UNV	µg/kg
1,2-Dichloroethene (Total)		4.33	UNV	µg/kg
Aroclor-1254	130	1.6	J	µg/kg
Aroclor-1260	130	3.8	U	µg/kg
Bromodichloromethane	4000	2.16	UNV	µg/kg
Cesium-137	1.4	0.0567	U	pCi/g
Radium-228	1.8	0.629	-	pCi/g
Technetium-99	30	1.76	U	pCi/g
Tetrachloroethene	3600	26.9	NV	µg/kg
Thorium-228	1.7	0.599	-	pCi/g
Thorium-230	280	14.4	U	pCi/g
Thorium-232	1.5	0.629	-	pCi/g
Trichloroethene	25000	1.4	NV	µg/kg
Uranium, Total	50	2.4	-	mg/kg
1,1,1-Trichloroethane		2.16	UNV	µg/kg
1,1-Dichloroethene	410	2.16	UNV	µg/kg
1,2-Dichloroethene (Total)		4.33	UNV	µg/kg
Aroclor-1254	130	4	U	µg/kg
Aroclor-1260	130	4	U	µg/kg
Bromodichloromethane	4000	2.16	UNV	µg/kg
Cesium-137	1.4	0.0823	U	pCi/g
Radium-228	1.8	1.05	-	pCi/g
Technetium-99	30	1.77	U	pCi/g
Tetrachloroethene	3600	2.16	UNV	µg/kg
Thorium-228	1.7	1.05	-	pCi/g
Thorium-230	280	18.8	U	pCi/g
Thorium-232	1.5	1.05	-	pCi/g

Area 6 OU1 Stockpile

Trichloroethene	25000	2.16	UNV	µg/kg
Uranium, Total	50	8.85	-	mg/kg
1,1,1-Trichloroethane		2.31	UNV	µg/kg
1,1-Dichloroethene	410	2.31	UNV	µg/kg
1,2-Dichloroethene (Total)		4.63	UNV	µg/kg
Aroclor-1254	130	111	-	µg/kg
Aroclor-1260	130	41.6	-	µg/kg
Bromodichloromethane	4000	2.31	UNV	µg/kg
Cesium-137	1.4	0.0661	U	pCi/g
Radium-228	1.8	0.966	-	pCi/g
Technetium-99	30	1.82	U	pCi/g
Tetrachloroethene	3600	2.31	UNV	µg/kg
Thorium-228	1.7	0.952	-	pCi/g
Thorium-230	280	25.7	U	pCi/g
Thorium-232	1.5	0.966	-	pCi/g
Trichloroethene	25000	2.31	UNV	µg/kg
Uranium, Total	50	15.7	-	mg/kg
1,1,1-Trichloroethane		2.42	UNV	µg/kg
1,1-Dichloroethene	410	2.42	UNV	µg/kg
1,2-Dichloroethene (Total)		4.85	UNV	µg/kg
Aroclor-1254	130	17.7	-	µg/kg
Aroclor-1260	130	8	J	µg/kg
Bromodichloromethane	4000	2.42	UNV	µg/kg
Cesium-137	1.4	0.0775	U	pCi/g
Radium-228	1.8	1.02	-	pCi/g
Technetium-99	30	1.97	U	pCi/g
Tetrachloroethene	3600	2.42	UNV	µg/kg
Thorium-228	1.7	0.986	-	pCi/g
Thorium-230	280	15.8	U	pCi/g
Thorium-232	1.5	1.02	-	pCi/g
Trichloroethene	25000	2.42	UNV	µg/kg
Uranium, Total	50	7.09	-	mg/kg
Aroclor-1254	130	92.6	NV	µg/kg
Aroclor-1254	130	3.98	UNV	µg/kg
Aroclor-1260	130	28.5	NV	µg/kg
Aroclor-1260	130	3.98	UNV	µg/kg
1,1,1-Trichloroethane		2.21	UNV	µg/kg
1,1-Dichloroethene	410	2.21	UNV	µg/kg
1,2-Dichloroethene (Total)		4.42	UNV	µg/kg
Aroclor-1254	130	388	-	µg/kg
Aroclor-1260	130	156	-	µg/kg
Bromodichloromethane	4000	2.21	UNV	µg/kg
Cesium-137	1.4	0.169	J	pCi/g
Radium-228	1.8	0.954	-	pCi/g
Technetium-99	30	1.78	U	pCi/g
Tetrachloroethene	3600	2.21	UNV	µg/kg
Thorium-228	1.7	0.963	-	pCi/g
Thorium-230	280	19	U	pCi/g
Thorium-232	1.5	0.954	-	pCi/g
Trichloroethene	25000	2.21	UNV	µg/kg
Uranium, Total	50	20.9	-	mg/kg
1,1,1-Trichloroethane		2.41	UNV	µg/kg
1,1-Dichloroethene	410	2.41	UNV	µg/kg
1,2-Dichloroethene (Total)		4.82	UNV	µg/kg
Aroclor-1254	130	4	U	µg/kg
Aroclor-1260	130	4	U	µg/kg
Bromodichloromethane	4000	2.41	UNV	µg/kg
Cesium-137	1.4	0.0796	U	pCi/g

Area 6 OU1 Stockpile

Radium-228	1.8	1.09	-	pCi/g
Technetium-99	30	1.85	U	pCi/g
Tetrachloroethene	3600	2.41	UNV	µg/kg
Thorium-228	1.7	1.07	-	pCi/g
Thorium-230	280	18.5	U	pCi/g
Thorium-232	1.5	1.09	-	pCi/g
Trichloroethene	25000	2.41	UNV	µg/kg
Uranium, Total	50	5.37	-	mg/kg
1,1,1-Trichloroethane		2.38	UNV	µg/kg
1,1-Dichloroethene	410	2.38	UNV	µg/kg
1,2-Dichloroethene (Total)		4.76	UNV	µg/kg
Aroclor-1254	130	3	J	µg/kg
Aroclor-1260	130	4.1	U	µg/kg
Bromodichloromethane	4000	2.38	UNV	µg/kg
Cesium-137	1.4	0.0953	U	pCi/g
Radium-228	1.8	1.02	-	pCi/g
Technetium-99	30	1.81	U	pCi/g
Tetrachloroethene	3600	2.38	UNV	µg/kg
Thorium-228	1.7	1.03	-	pCi/g
Thorium-230	280	22.8	U	pCi/g
Thorium-232	1.5	1.02	-	pCi/g
Trichloroethene	25000	2.38	UNV	µg/kg
Uranium, Total	50	5.75	-	mg/kg
Aroclor-1254	130	92.3	NV	µg/kg
Aroclor-1260	130	41.2	NV	µg/kg
Aroclor-1254	130	26.5	NV	µg/kg
Aroclor-1260	130	5.8	NV	µg/kg
Aroclor-1254	130	18.2	NV	µg/kg
Aroclor-1260	130	6.9	NV	µg/kg
Aroclor-1254	130	7.5	NV	µg/kg
Aroclor-1260	130	2.5	NV	µg/kg

Appendix C

APPENDIX C

SURFACE WATER CALCULATIONS

Surface Water Calculations

Surface water calculations performed utilizing the Rational Method:

I) Peak Runoff Rate for culvert at Impacted Material Haul Road

Q = CiA

Q = peak runoff rate, cfs

C = dimensionless coefficient based on land use

i = storm intensity for the design frequency and for a duration equal to the time of concentration, iph.

A = drainage area, acres

i) Runoff Coefficient

From Runoff Coefficient Table:

C = 0.6 gravel

C = 0.6 bare soil

therefore, the runoff coefficient used will be C = 0.6.

ii) Storm Intensity

Sheet Flow:

From Overland Flow Time Graph (See Figure 1):

Length (feet)	Surface Type	Starting Elevation	Ending Elevation	Slope (% Grade)	Time of Concentration Tc (minutes)
170	Gravel	590	588	1.2%	10.5

Concentrated Flow in Ditch:

Length (feet)	Surface Type	Starting Elevation	Ending Elevation	Slope (% Grade)	Assumed Time of Concentration Tc (minutes)
1100	Ditch	588	576.85	1.0%	5.0

Tc = 10.5 minutes

From Intensity Duration Curves for Cincinnati, Ohio (See Figure 2):

i = 4.5 inches per hours (iph)

iii) Drainage Area (See Figure 3)

A = 2.3 acres

iv) Calculation

Q = 0.6 * 4.5 iph * 2.3 acres

Q = 6.2 cfs

II) Size Pipe from OU1 SP across IMHR

i) Chezy-Manning equation used to calculate normal depth of flow in circular channel where when flowing full, normal depth is the inside pipe diameter.

$$d = 1.335\left(\frac{n\,Q}{\sqrt{S}}\right)^{3/8}$$

where: n (for HDPE pipe) = .009
S = 1 % and Q = 6.2 cfs

d = 1.07-ft = 12.87-in (minimum ID)

ii) Trial of pipe sizes using Manning equation

$$Q = \left(\frac{1.486}{n}\right) A\ R^{2/3}\ S^{1/2}$$

where: $A = \frac{\pi D^2}{4}$ and $R = \frac{D}{4}$ and S = 1%

Try 16-in HDPE SDR 11 with 12.974-in ID

Q = 6.34 cfs Greater than 6.2 cfs, therefore OK

Due to 16-in not being a standard pipe size, increase to next standard pipe size to 18-in.

III) Peak Runoff Rate for culvert at Second Street

Q = CiA

Q = peak runoff rate, cfs

C = dimensionless coefficient based on land use

i = storm intensity for the design frequency and for a duration equal to the time of concentration, iph.

A = drainage area, acres

i) Runoff Coefficient

From Runoff Coefficient Table:

C = 0.95 Asphalt Pavement

C = 0.4 Vegetated road shoulder and ditch

Distribution of acreage from iii) below to calculate runoff coefficient C:

$$C = \frac{(.95)(0.7 \text{ acres}) + (0.4)(1.6 \text{ acres})}{2.3 \text{ acres}}$$

therefore, the runoff coefficient used will be C = 0.6

ii) Storm Intensity

Assume Tc = 10 minutes

From Intensity Duration Curves for Cincinnati, Ohio (See Figure 4):

i = 5.4 inches per hours (iph)

iii) Drainage Area (See Figure 3)

Asphalt Acreage	A = 0.7 acres
Vegetated Acreage	A = 1.6 acres
Total Acreage	A = 2.3 acres

iv) Calculation

Q = 0.6 * 5.4 iph * 2.3 acres

Q = 7.5 cfs plus 6.2 cfs from previous drainage area calculation, therefore

Q_{Total} = 13.7 cfs

IV) Size Pipe Across Second Street

i) Chezy-Manning equation used to calculate normal depth of flow in circular channel where when flowing full, normal depth is the inside pipe diameter.

$$d = 1.335\left(\frac{n\,Q}{\sqrt{S}}\right)^{3/8}$$

where: n (for HDPE pipe) = .009
S = 1 % and Q = 13.7 cfs

d = 1.44-ft = 17.33-in (minimum ID)

ii) Trial of pipe sizes using Manning equation

$$Q = \left(\frac{1.486}{n}\right) A \; R^{2/3} \; S^{1/2}$$ where: $A = \frac{\pi D^2}{4}$ and $R = \frac{D}{4}$ and $S = 1\%$

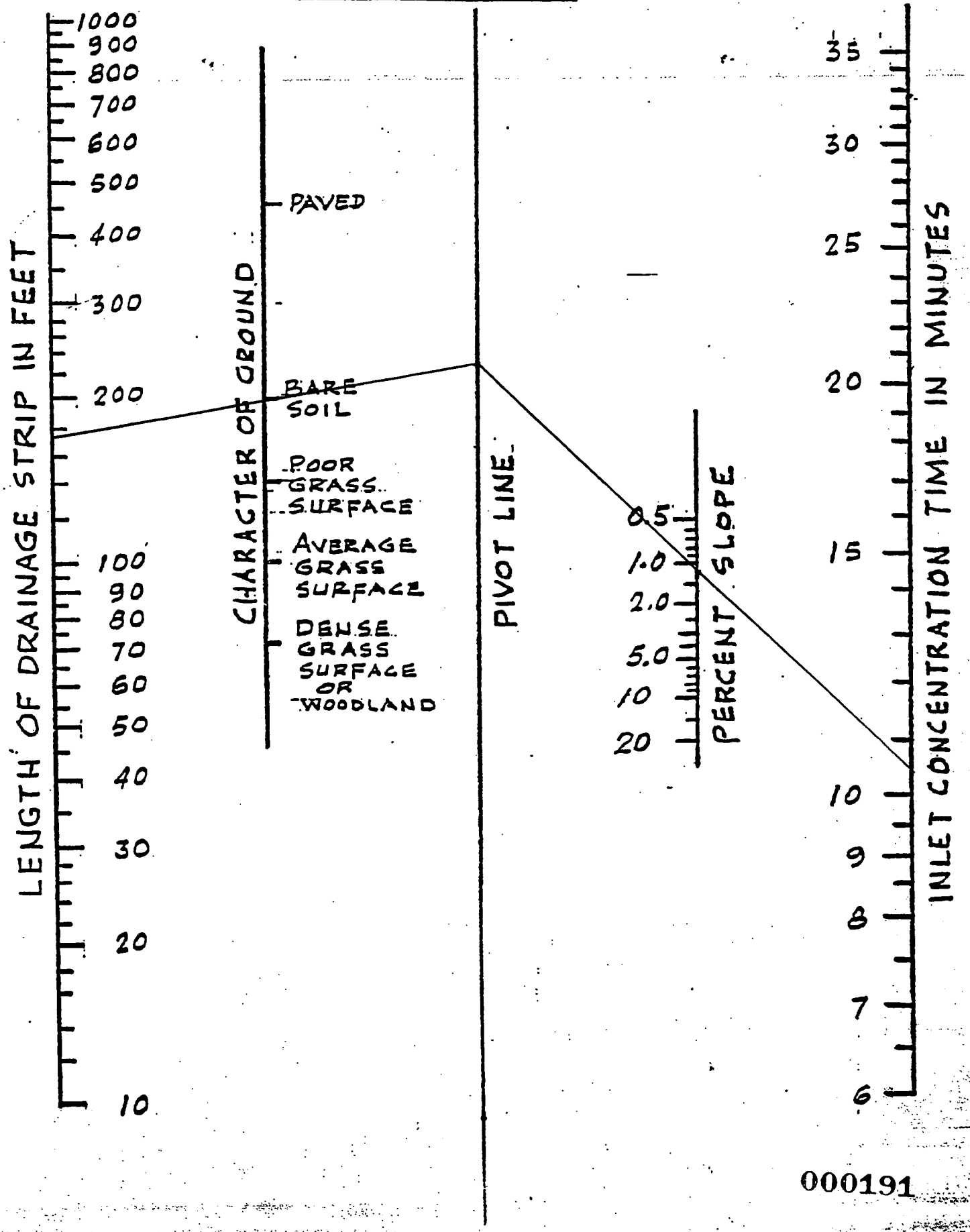
Try 22-in HDPE SDR 11 with 17.840-in ID

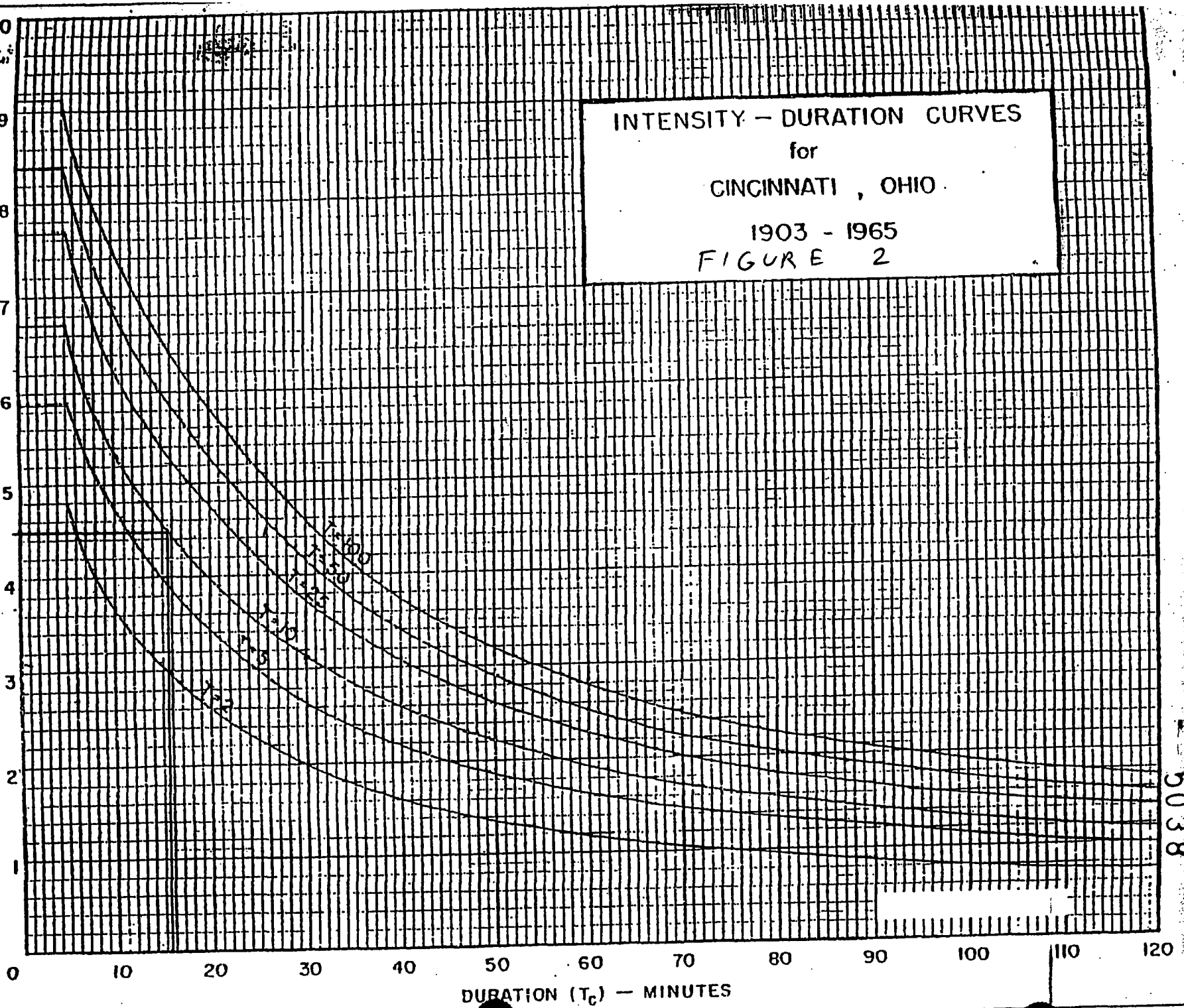
Q = 14.82 cfs Greater than 13.7 cfs, therefore OK

Due to 22-in not being a standard pipe size, increase to next standard pipe size to 24-in.

FIGURE 1

OVERLAND FLOW TIME





Overlay Bureau 3/9/77

EFFECTIVE DATE 3-77

TITLE INTENSITY-DURATION CURVES CINCINNATI, OHIO

KENTUCKY BUREAU OF HIGHWAYS

0000192

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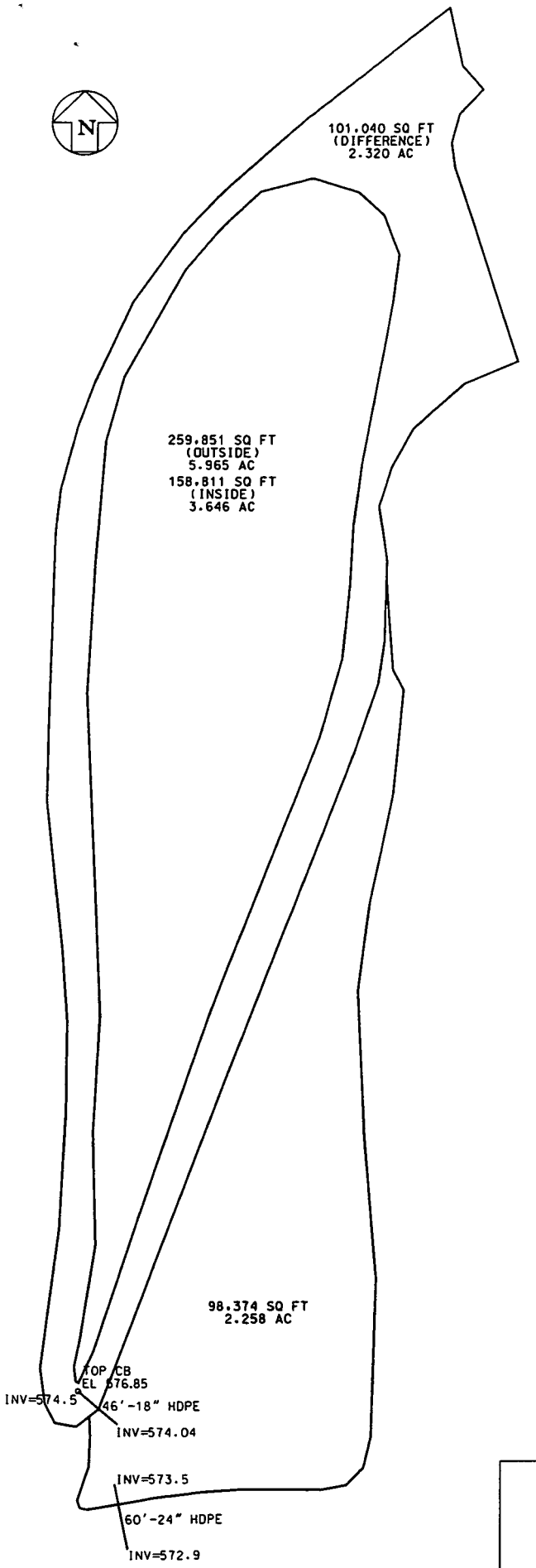
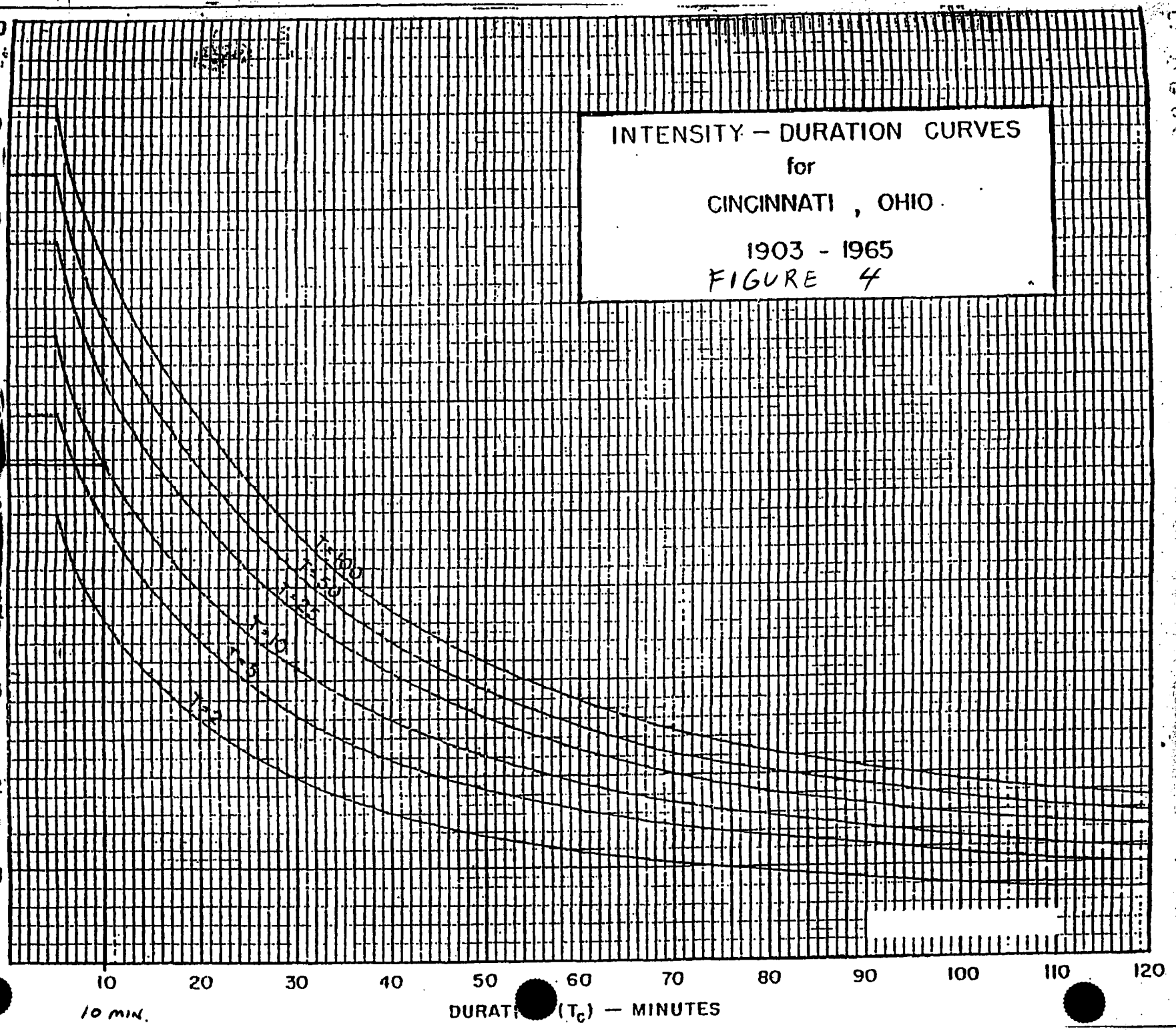


OU1 STOCKPILE DRAINAGE SUBAREAS

(NOT TO SCALE)

FIGURE 3

/csdf/Project20600/Figure3.dgn



INTENSITY-DURATION CURVES

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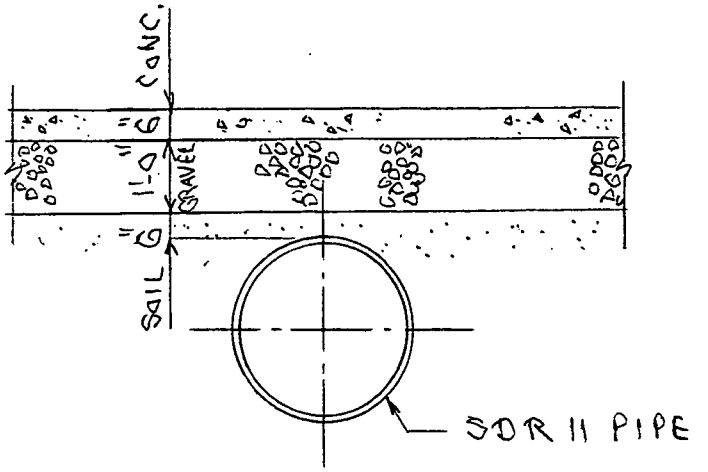
Ref DWG No. 99X-5500-G-00790, Rev A for 12"Ø & 24"Ø SDR 11 HDPE Pipe Culverts at IMHR and 2nd Street, respectively



Ref. Driscopipe Polyethylene Piping Systems Manual (Pages 36-43) and Caterpillar Performance Handbook, Edition 28, Page 10-3, Specifications for D400E (40" Articulated Truck

Total external soil pressure, $P_T = P_S + P_L + \cancel{P_I}^{0}$

$$P_S = P_{DE} + \cancel{P_{WE}}^{0} + \cancel{P_B}^{0}$$

$$= (100 \times \tfrac{1}{2}) + (150 \times 1) + (144 \times \tfrac{1}{2}) = 272 \text{ lbs/ft}$$

$$P_L = \frac{3Wz^3}{2\pi R^5}$$

$$= \frac{3W}{2\pi R^2} \quad (\text{Since } R = z)$$

$$= \frac{3 \times 1.50 \times 24{,}565}{2\pi \times (2)^2} = 4398 \text{ lbs/ft}^2$$

$$\therefore P_T = 272 + 4398 = 4670 \text{ lbs/ft}^2 \text{ or } 32.43 \text{ psi}$$

9/3/03

Check for wall Crushing

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Actual Compressive Stress, $S_A = \left(\frac{SDR}{2} - 1\right) \times P_T$

$= \left(\frac{11-1}{2}\right) \times 32.43 = 162$ psi

allowable

$\therefore$ F.O.S. against wall crushing $= \frac{1500}{162} = 9.26$

ok.

Check for wall Buckling

Critical-collapse differential pressure, $P_c = \frac{2.32\,E}{(SDR)^3}$

$= \frac{2.32 \times 35{,}000}{(11)^3}$

$= 61$ psi

Critical buckling pressure, $P_{cb} = 0.80\sqrt{(E')(P_c)}$

$= 0.80\sqrt{771 \times 61}$

$= 173.50$ psi

$\therefore$ F.O.S. against buckling $= \frac{P_{cb}}{P_T} = \frac{173.50}{32.43} = 5.35$

ok.

Therefore, the culverts at IMHR and 2nd. Street are safe for the 40T Articulated Truck

TOPS 35502

Appendix D

APPENDIX D

LIST OF DRAWINGS AND SPECIFICATIONS ISSUED

IRDP TECHNICAL SPECIFICATIONS

The following specifications make up the combined OU1 Stockpile Area technical specification package specific to this remediation effort:

Section 02150	Traffic Control
Section 02205	Impacted Material Excavation
Section 02206	Earthwork for Remediation
Section 02207	Area Isolation Trenching
Section 02275	Surface Water Management and Erosion Control for Remediation
Section 02668	Transfer Lines
Section 15060	Pipe, Fittings, Valves, and Accessories
Section 15160	Lift Station Pumps
Section 16050	Basic Electrical Materials and Methods
Section 16170	Grounding and Bonding
Section 16370	Overhead Power Distribution
Section 16462	Dry Type Transformers/Panelboards

SPECIFICATIONS REFERENCED FROM OSDF DESIGN

The following specifications are referenced in this design from the OSDF technical speciciations 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

APPENDIX D
LIST OF DRAWINGS AND TECHNICAL SPECIFICATIONS

The following drawings and specifications have been submitted along with this Implementation Plan to constitute the IRDP for OU1 Stockpile Area:

IRDP DRAWINGS

Area	Drawing No.	Sheet No.	Drawing Title
6 (OU1)	99X-5500-G-00783	G-1	Grading and Drainage Plan (South)
6 (OU1)	99X-5500-G-00791	G-2	Grading and Drainage Plan (North)
6 (OU1)	99X-5500-G-00792	G-3	Cross Sections
6 (OU1)	99X-5500-G-00793	G-4	Final Ditch Grading Plan (South)
6 (OU1)	99X-5500-G-00794	G-5	Final Ditch Grading Plan (North)
6 (OU1)	99X-5500-G-00790	G-6	Civil Details

UTILITY GRID REFERENCE DRAWINGS

The following drawings are referenced in this design and are included in this IRDP. These drawings are in order by grid number.

Area	Drawing No.	Drawing Title
6 (OU1)	22X-5500-P-00659	Master Grid of Underground Utility Plans
6 (OU1)	22B-5500-P-00683	Grid 24 Underground Utilities
6 (OU1)	22D-5500-P-00684	Grid 25 Underground Utilities
6 (OU1)	22A-5500-P-00805	Grid 31B Underground Utilities

TECHNICAL REFERENCE DRAWINGS

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

Area	Drawing No.	Drawing Title
6 (OU1)	M-15-81-009	Stockpile Conveyor Foundation Plan and Details