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ACTIVE FLYASH PILE CONTROLS REMOVAL ACTION WORK PLAN FEBRUARY 1992 REVISION 2

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Active Flyash Pile Controls Removal Action Work Plan

FERNALD OFFICE
Fernald, Ohio

FEBRUARY 1992

Revision 2

U.S. DEPARTMENT OF ENERGY

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Active Flyash Pile Controls Removal Action Work Plan

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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
ASI/IT	Advanced Sciences, Inc./International Technology Corp.
BMP	Best Management Plan
CADD	Computer Aided Design and Drafting
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSI	Construction Specifications Institute
DOE	United States Department of Energy
FEMP	Fernald Environmental Management Project
FMPC	Feed Materials Production Center
HSL	Hazardous Substances List
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
NCP	National Contingency Plan
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Act
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
pCi/l	PicoCuries per liter
pCi/g	PicoCuries per gram
RI/FS	Remedial Investigation/Feasibility Study
RSE	Removal Site Evaluation
US EPA	United States Environmental Protection Agency
WEMCO	Westinghouse Environmental Management Company of Ohio
BTU/lbm	British Thermal Units per pound mass

EXECUTIVE SUMMARY

The United States Department of Energy (DOE) has initiated a Removal Site Evaluation (RSE) by the authority delegated to the Department by Executive Order 12580 under Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). An RSE was performed consistent with Section 40CFR 300.410 of the National Contingency Plan (NCP) to determine if conditions at the existing Active Flyash Pile at the Fernald Environmental Management Project (FEMP) Site warranted the implementation of a CERCLA Removal Action as an interim step prior to final remediation. Based on this evaluation and Section IX.F of the 1991 Amended Consent Agreement between the DOE and the United States Environmental Protection Agency (US EPA), the DOE has determined that the Active Flyash Pile constitutes a time-critical Removal Action as defined in the NCP. The objective of this Removal Action is to implement interim actions to provide fugitive dust and surface water runoff control at the Active Flyash Pile.

The 1991 Amended Consent Agreement requires the submission of a Letter Report addressing the current Utility Practices for Flyash Management and a Work Plan for the Removal Action. The Letter Report was submitted to the US EPA on September 26, 1991. This document is the Work Plan describing the activities associated with the Removal Action and is being provided to the US EPA for approval in accordance with the aforementioned Consent Agreement. The development and submission of the Work Plan is consistent with the Applicable or Relevant and Appropriate Requirements (ARARs).

The proposed Removal Action consists of the following activities:

1) Installation of a silt trap made from permeable geotextile fabric around the toe of the ash pile.

2) Installation of a wind barrier made from high density polyethylene around the top perimeter of the ash pile.

3) Alteration of the active working surface to minimize the non-compacted area and to prevent increase in the maximum height of the existing pile.

4) Minor regrading of the outer berm and compacting the nonworking top surfaces of the ash pile.

5) Application of water and foam and binding type dust-control agents on side slopes and top.

6) Providing periodic routine inspection and necessary maintenance identified during inspection.

The proposed Removal Action will significantly mitigate the wind and water erosion of the existing Active Flyash Pile at the FEMP Site. This Removal Action will be completed prior to initiation of the final remedial action for Operable Unit 2 (OU 2). This action will be integrated with the remedial action and will not impose any restrictions for implementing any of the alternatives under consideration for the remedial action.

SECTION 1

INTRODUCTION

The Active Flyash Pile is one of the subunits included in OU 2 for final remediation at the FEMP site. As an interim step prior to the final remediation, a Removal Action for the ash pile is necessary in accordance with the RSE and the Action Memorandum. The following factors were considered in arriving at the final recommendation for the Removal Action detailed in this Work Plan:

1) Existing practices
2) Flyash characterization
3) Physical characteristics of the pile and surrounding areas
4) Integration with the final remediation plans
5) Compliance requirements
6) Economics of various alternatives

This Work Plan is developed and being submitted for review and approval to fulfill the requirements of the Amended Consent Agreement. All activities performed under this Work Plan will be pursuant to the NCP and consistent with the Office of the Solid Waste and Emergency Response (OSWER), Directive 9360.0-03B, Superfund Removal Procedures, Revision 3.

SECTION 2

OVERVIEW

2.1 Site History

Two coal-fired boilers have been in use for steam production at the FEMP since 1951. The steam was used as a source for heating, laundry facility operations, uranium metal production, and minor miscellaneous uses. Uranium metal production has been discontinued since 1989. Coal combustion generates approximately 7 tons of ash waste per day during fall and winter and approximately 3 tons of ash waste per day during spring and summer. Ash waste consists of 70 percent bottom ash (collected below the boilers), and the remaining 30 percent consists of precipitator ash (collected from pollution control devices) and flyash (removed from the middle levels of the boiler). The ash is transported to the Active Flyash Pile area several times a week (see Figures 2-1, 2-2, and 2-3). Since July 1991, this ash pile has been watered down as needed and historically graded approximately every 3 months to maintain a level working surface.

The Active Flyash Pile is located approximately 3,000 feet southwest of the FEMP's former production area and just east of the Southfield area (see Figure 2-4). The active pile has been receiving coal ash since the mid-1960s. The pile is estimated to contain approximately 59,000 cubic yards of flyash. It has a surface area of about 3 to 4 acres. The working surface of the ash pile gently slopes from the east and the south down to the north while the sides are steeply sloped at a natural angle of repose in the western and southern edges. The pile depth ranges from 3 to 40 feet.

2.2 Characterization

The characterization of the Active Flyash Pile is based on two studies (Weston 1987 and DOE 1988). Samples from the Active Flyash Pile have been analyzed for barium and chromium, volatile organics, and radionuclides in composite and ash samples (DOE 1991). The flyash from the Active Flyash Pile is assumed to be non-toxic and non-hazardous and to contain radionuclides below unrestricted release values. Flyash, as defined in Ohio Policy Number 4.07, is considered to be non-toxic if its leachate does not exceed 30 times the Ohio Drinking Water Standards. Pursuant to OAC 3745-27-02, non-toxic flyash is not regarded as solid waste.

Figure 2-1 - Precipitator Ash Entering the Truck

Note: Precipitator ash is finer and provides an opportunity for the generation of fugitive dust as opposed to the bottom ash (Date of Picture Nov. 4, 1991)

Figure 2-2 - Truck Being Covered with a Tarp for Transportation of Ash (Date of Picture Nov. 4, 1991)

Figure 2-3 - Unloading Ash at the Active Flyash Pile (Date of Picture Nov. 4, 1991)

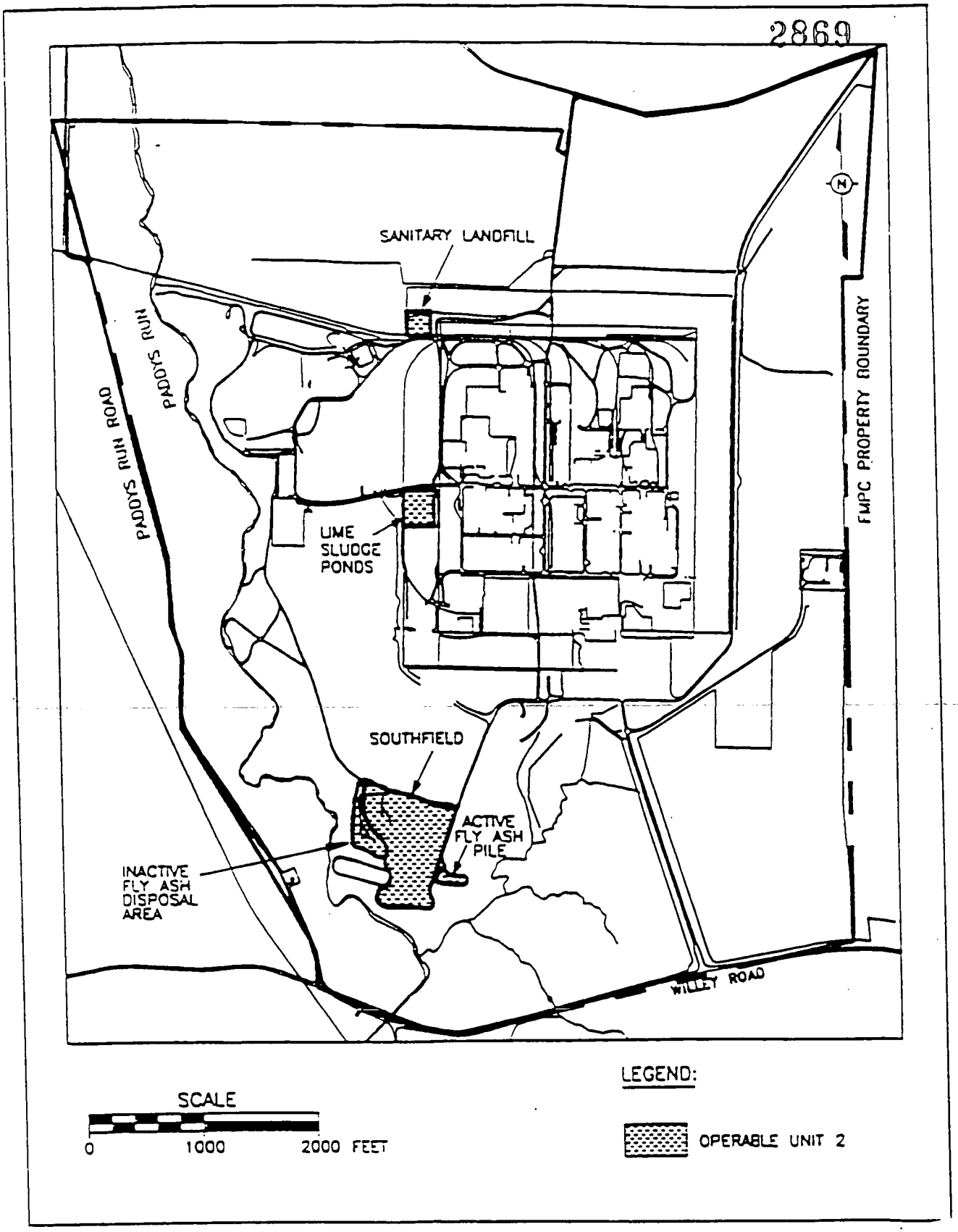

Figure 2-4 - Site Map

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Data from a DOE 1988 study were obtained from nine sampling locations in the Active Flyash Pile. Eight of the locations were sampled on the surface of the flyash. Soil borings were performed for only one sampling location. Table 2-1 presents the data from this location at boring levels of 0 to 5 feet, 5 to 11 feet, and 11 to 13.5 feet. All samples were analyzed for heavy metals, volatile organics, and radionuclides.

All other data presented in this section represent the area in the vicinity of the flyash pile. They do not, however, represent the flyash pile itself. These data were presented in the draft Remedial Investigation Report (Task 6), (DOE 1990).

Composite soil sample analytical data from the Weston 1987 study are presented in Table 2-2. Data from the Weston 1987 study are limited to two samples obtained in surface soils in the area of the Active Flyash Pile. One of the samples was taken in the area of the storm sewer outfall ditch, and the other sample was obtained from soil adjacent to the flyash pile. These samples were analyzed for radionuclides (Pb-210, Ra-226, Ra-228, Th-228, Th-230, Th-232, U-234, U-235, and U-238).

Table 2-3 presents hazardous substance concentrations in surface water samples collected near the Active Flyash Pile. Table 2-4 presents hazardous substance concentrations in sediment samples collected near the Active Flyash Pile. Surface water and sediment samples were obtained during RI/FS sampling. An interpretation of these data is presented in the draft RI Report (Task 6).

Borings were obtained from four locations in the Active Flyash Pile during RI field sampling in the summer of 1991. These results are not yet available.

2.3 Summary of the Potential Threat

The Active Flyash Pile has never been covered, and surface vegetation is negligible. Photographs of the pile and a topographic plan are provided in Figures 2-5, 2-6, and 2-7. In July 1991, after a period of hot and dry weather and recent grading of the pile, high wind conditions produced an ash cloud that was visible off site. Two inspections of the Active Flyash Pile were made by PARSONS in September 1991. Observations revealed small amounts of ash (less than 1 inch thick in the grass within 20 feet of the base of the pile and a light dusting on vegetation around the pile). Signs of mild scouring from runoff water were also visible on the south and west slopes of the pile.

Table 2-1 - Hazardous Substance Concentrations in Samples from the Active Flyash Pile

Hazardous Substance	Frequency of Detection	Range of Detected Concentrations [a]
Organics		mg/kg
Acetone	3/3	0.037 - 0.140 (0.080) [b]
2-Butanone	1/3	0.067
Chloroform	1/3	0.011
Methylene chloride	2/2	0.160 - 0.200 (0.12)
1,1,1-trichloroethane	2/3	0.140 - 0.420 (0.19)
Toluene	3/3	19.0 - 89.0 (36.0)[c]
Metals		
Chromium	1/3	0.06
Radionuclides		pCi/g
Bi-214	3/3	3.1 - 3.5 (3.3)
Ra-226	3/3	2.3 - 3.3 (2.9)
Th-228	3/3	1.1 - 2.9 (2.0)
Th-232	3/3	1.4 - 2.8 (2.1)
Total Uranium	3/3	5.5 - 17.0 (11.3)

[a] Concentrations in the Active Flyash were obtained from the DOE 1988 data. Borings used were FE0601WP, 0 - 5 feet; FE0602WP, 5 - 11 feet; and FE0603WP, 11 - 13.5 feet.

[b] Numbers in parentheses represent arithmetic means.

[c] Toluene was not detected in FE0601WP, FE0602WP, or FE0603WP. These data represent three surface samples (FE0100WP, FE0101WP, and FE0104WP) in which toluene was detected.

Source: DOE 1988

Table 2-2 - Radionuclide and Inorganic Concentrations
from Soils in the Vicinity of the Active Flyash Pile

Hazardous Substance	Frequency of Detection	Range of Detected Concentrations [a]
Metals		mg/kg
Uranium	3/3	5.5 - 17.0 (12.5) [b]
Radionuclides		pCi/g
Pb-210	1/2	4.0
Ra-226	2/2	0.4 - 2.4 (1.4)
Ra-228	2/2	0.9 - 1.7 (1.3)
Th-228		
Th-230	2/2	0.7 - 5.3 (3.0)
Th-232	1/2	0.1
U-234	2/2	4.5 - 5.7 (5.1)
U-235	2/2	0.1 - 0.2 (0.15)
U-238	2/2	5.1 - 6.8 (6.0)

[a] Radionuclide and uranium data were obtained from composite soil samples taken for the CIS (Weston 1987), Area 25.

[b] Numbers in parentheses represent arithmetic means. Nondetectables were assumed to be at the detection limit for the purpose of determining the average concentration in the samples.

Table 2-3 - Hazardous Substance Concentrations in Surface Water Samples Collected near the Active Flyash Pile

Hazardous Substance	Frequency of Detection	Range of Detected Concentrations [a]
Metals		mg/l
Arsenic	2/2	0.0067 - 0.0455 (0.0261)[b]
Barium	2/2	0.0426 - 0.0633 (0.0530)
Chromium	2/2	0.0155 - 0.0224 (0.0190)
Copper	2/2	0.0161 - 0.0221 (0.0191)
Lead	1/2	0.0362
Manganese	2/2	0.0023 - 0.158 (0.0802)
Mercury	2/2	0.00022 - 0.00099 (0.00061)
Molybdenum	2/2	0.0062 - 0.0183 (0.0123)
Nickel	2/2	0.0211 - 0.0149 (0.0180
Selenium	2/2	0.0037 - 0.0291 (0.0164)
Uranium	4/4	0.014 - 1.69 (0.56)
Radionuclides		pCi/l
Ra-226	1/4	1.5 (1.1)

[a] Concentrations of chemicals in surface water samples were obtained from ASI/IT RI/FS surface water data rounds 1 - 4. Samples ASIT-004 to ASIT-007 were used.

[b] Numbers in parentheses represent arithmetic means. Nondetectables were assumed to be at the detection limit for the purpose of determining the average concentration in the samples.

Source: DOE 1990

Table 2-4 - Hazardous Substance Concentrations in Sediment Soil Samples in the Vicinity of the Active Flyash Pile

Hazardous Substance	Frequency of Detection	Range of Detected Concentrations [a]
Organics		mg/kg
Acetone	1/1	0.055
Methylene chloride	1/1	0.016
Metals		
Aluminum	1/1	8,830
Arsenic	1/1	5.4
Barium	1/1	56.7
Beryllium	1/1	0.4
Chromium	1/1	12.5
Cobalt	1/1	8.1
Copper	1/1	16.1
Lead	1/1	12.0
Manganese	1/1	399.0
Mercury	1/1	1.30
Nickel	1/1	19.1
Uranium	4/4	4.53 - 51.8 (29.5)[b]
Vanadium	1/1	14.4
Zinc	1/1	47.6
Radionuclides		pCi/g
Ra-226	4/4	0.637 - 2.89 (1.4)
Ra-228	4/4	0.703 - 2.77 (1.3)

[a] Concentrations of chemicals in sediment were obtained from ASI/IT RI/FS sediment data rounds 1-4. Samples used were ASIT-004 to ASIT-007.

[b] Numbers in parentheses represent arithmetic mean.

Source: DOE 1990

In 1988, water samples were collected from both the Storm Sewer Outfall Ditch (located directly east of the pile) and the drainage ditch (located west of the pile) as part of the Best Management Plan (BMP) Sampling Program. The samples indicated elevated levels of heavy metals and total suspended solids. These elevated levels may be attributable to ash pile runoff. A review of the water samples analysis results by Roy F. Weston, Inc., in 1987, indicates a possible migration of heavy metals into the natural drainage system as a result of the ash pile runoff.

In summary, there are two potential threats from the active flyash pile that necessitate the Removal Action. First, fugitive dust carried by wind, and second, possible migration of contaminants via stormwater runoff.

2.4 Related Actions

2.4.1 Ongoing Activities

Since the Removal Action is only an interim step prior to final remediation under CERCLA, the Active Flyash Pile will continue to receive ash on an ongoing basis as required to support boiler plant operations. Currently, water and a dust control agent are added at the time the ash is loaded into the truck for transport to the ash pile. The Removal Action will continue this practice. As areas are filled up with flyash, they will be partitioned and become inactive. Grading and compaction of the flyash will continue throughout the active life of the pile, as will regular inspections and maintenance.

2.4.2 Future Activities

An interim action is planned to control erosion of the Active Flyash Pile by June 30, 1992.

Modification to the existing inspection and maintenance procedures and periodic inspection of the side slopes, silt trap, and wind barrier will be required. Any deterioration noted by the inspection must be identified, maintenance scheduled, and repairs performed.

2.4.3 Potential Interferences

A pipeline for the South Groundwater Contamination Plume Removal Action is to be installed along the access road west of the Active Flyash Pile. Although occurring in the same time period, the South Plume Removal Action will not interfere with any of the Removal Action activities planned for the Active Flyash Pile or its final remediation.

View of Active Flyash Pile Looking South (Date of Picture: April 16, 1991)

Figure 2-5

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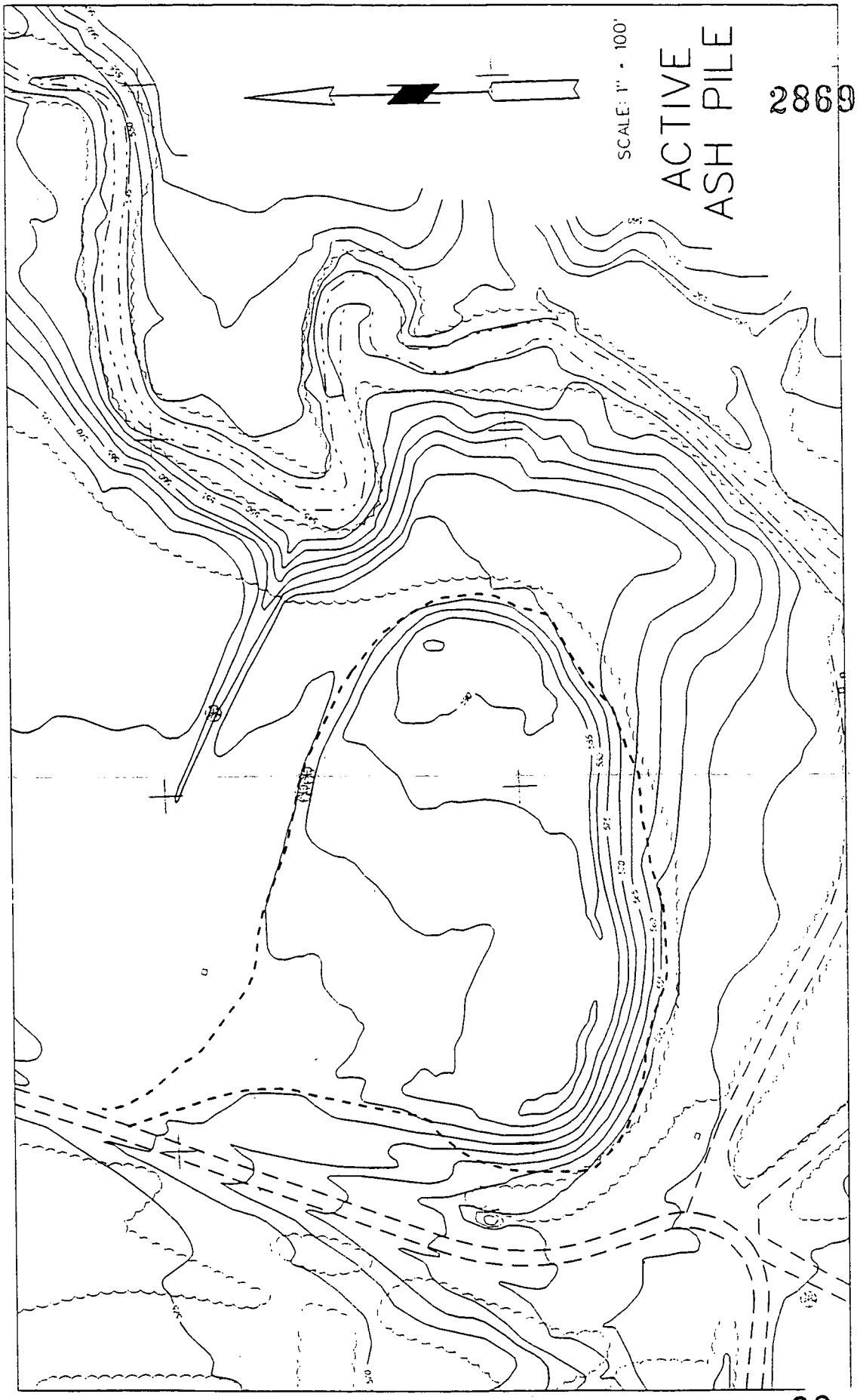
View of Active Flyash Pile Looking North (Date of Picture: April 16, 1991)

Figure 2-6



Plan of the Active Flyash Pile

Figure 2-7

2.5 Roles of the Participants

As the Lead Agency for all Removal Actions at the FEMP, the DOE will coordinate and execute the Removal Action.

Westinghouse Environmental Management Company of Ohio (WEMCO), as the FEMP Site Integrating Contractor is responsible for the implementation of this Removal Action in a manner consistent with the DOE and regulatory requirements and guidance.

As a subcontractor to WEMCO, PARSONS is responsible for the title design and technical support for implementation of this Removal Action.

As a contractor to WEMCO, RUST Engineering Company, Construction Manager, will be responsible for the construction activities for the Removal Action.

2.6 Removal Action

2.6.1 Objective

Based on the RSE and the Amended Consent Agreement, the DOE has determined the necessity for a time-critical Removal Action for the Active Flyash Pile at the FEMP site. Pursuant to the directive from the DOE, this Removal Action is proposed to minimize the wind and water erosion of the ash pile.

2.6.2 Proposed Removal Action

The proposed Removal Action consists of the following activities:

1) Partial Removal Action for third quarter of '92
2) Install a silt trap around the base of the ash pile
3) Install a wind barrier around the top perimeter of the ash pile
4) Regrade the outer berm and compact the nonworking top surfaces
5) Apply water and dust-control agents regularly on side slopes and top
6) Alter the working surface to minimize the non-compacted area and stabilize remainder and to prevent increase in maximum height of the existing pile
7) Provide periodic routine inspection and necessary maintenance identified during the inspection.

2.6.3 Implementation

2.6.3.1 Silt Trap

The silt trap will consist of permeable geotextile fabric firmly fastened to vertical supports and will be located approximately 5 feet away from and around the toe of the ash pile (see Figure 2-8). Silt traps will also be provided as an additional precaution (one on the north side and the other on the west side of the active ash pile) where stormwater drainage facilities exist. Vegetation around the toe of the pile will be cleared, starting from the toe of the pile and extending outward for 5 feet.

2.6.3.2 Wind Barrier

Wind barriers are proposed for strategic areas around the top of the Active Flyash Pile. Wind barriers typically consist of ultra-violet stabilized, high density polyethylene fence. The barrier, approximately 4 feet high, is supported upright. The wind barrier disturbs the airflow near the pile surface such that any airborne ash particles cannot be suspended by wind and thus, drop to the surface near the barrier. For this purpose, the fence is durable and would be expected to last for several years. With adequate supports, the barrier will survive moderate winds. As the pile grows, the wind barrier between the inactive and the active pile areas will be extended to partition these areas.

2.6.3.3 Regrading and Compaction

Minor regrading consists of confining all cut volumes to the upper rim of the Active Flyash Pile. This will hold the present peak elevation surface area limits and maintain the present side slope of the ash pile. All material from this regrading will be brought to the interior of the pile and placed over the remaining area of operation. Fill material generated from the minor regrading and future ash will be compacted.

Grading and compaction of newly generated flyash will continue throughout the active life of the pile. Additional measures, such as wetting the pile surface with water and dust-control agents, will be used concurrently with these activities. The extent of regrading is indicated in Figures 2-8 and 2-9.

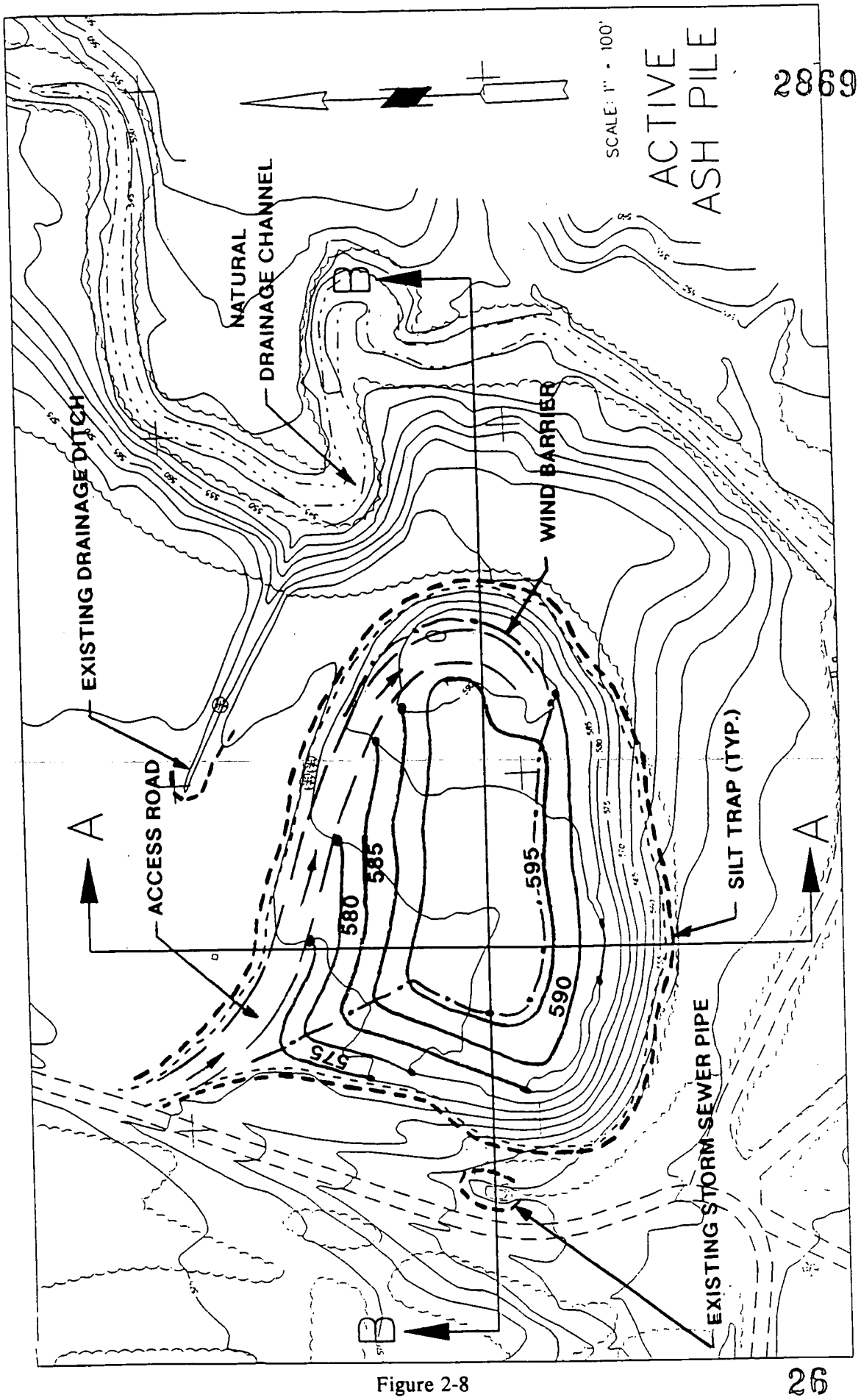


Figure 2-8

Removal Action

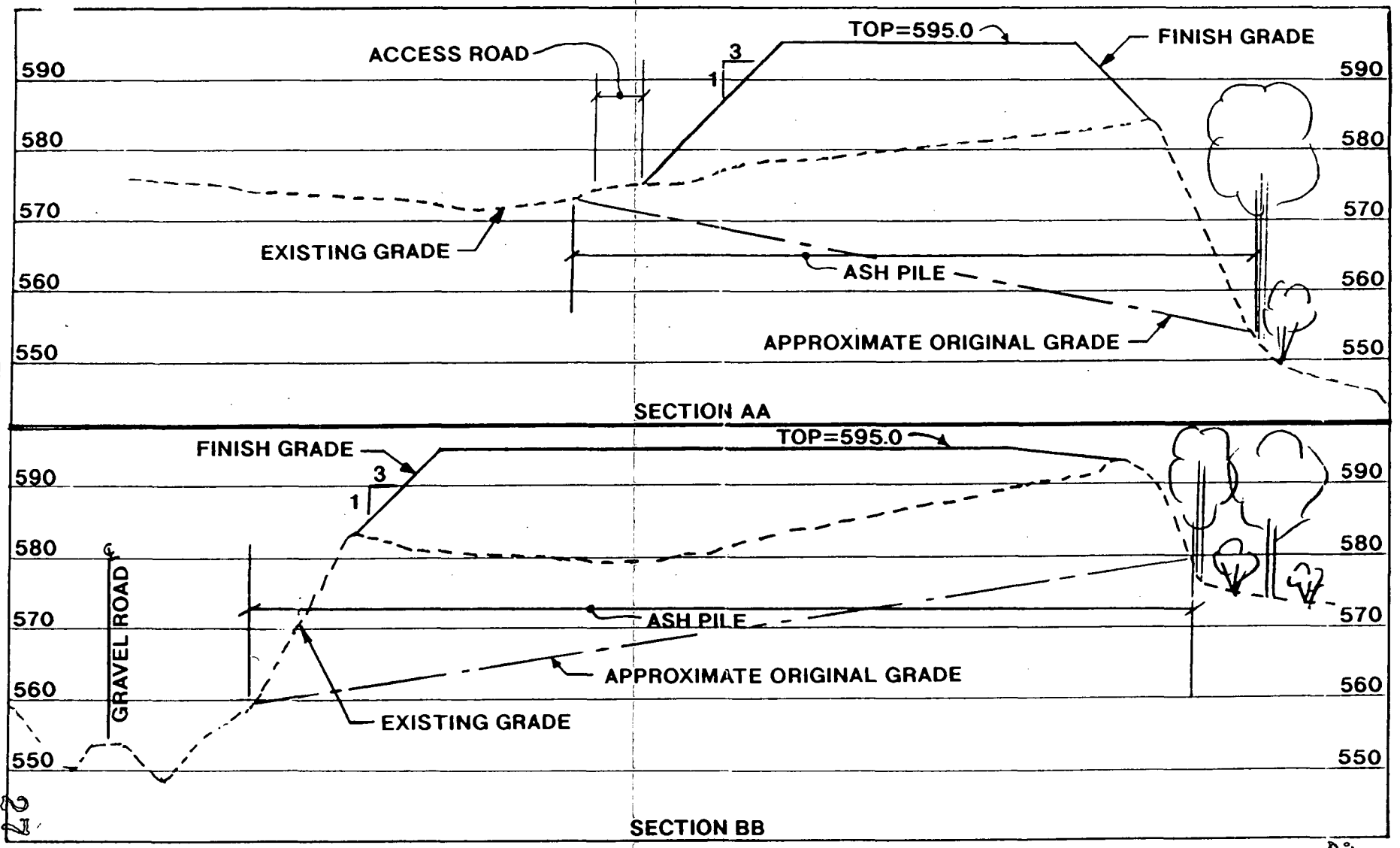


Figure 2-9

Extent of Active Flyash Pile Regrading (Sections)

2.6.3.4 Application of Water and Dust-Control Agents

The application of water and dust-control agents is required as part of this Removal Action. Dust-control agents can be divided into two broad categories: (1) surface binders that alter the charge on the particles allowing them to agglomerate and, with some agents, also act as an adhesive between the particles; and (2) crusting agents that form a flexible, elastomeric bridge between the particles. These agents will be sprayed on the surface of the flyash pile and at the transfer point as the ash is being loaded into trucks for transport to the pile. From observations made of the current ash-handling operations, it has been determined that a surface binder be applied both at the transfer point and at the working surface of the pile and that either a crusting agent or a surface binder be applied on the sides or inactive surface of the pile. Amounts and rates of application of dust-control agents will be specified and verified by performance testing. Application equipment will consist of fixed sprayers at the transfer point and mobile, hand-held sprayers at the flyash pile.

2.6.3.5 Alteration of the Working Surface

The working surface will be altered to minimize the noncompacted area as newly generated flyash is graded and compacted throughout the active life of the pile. Application of water and dust-control agents will occur during this action to minimize fugitive emissions. The Active Flyash Pile will be partitioned into active and inactive areas which will change continually as the ash pile is built up.

2.7 Integration with the Remedial Action

This Removal Action will be completed prior to initiation of the final remedial action for the Active Flyash Pile. The Removal Action will be well integrated with the remedial action--the Removal Action will add very little additional waste that must be remediated. It also will not impose any restrictions for implementing the considered alternatives for the remedial action.

SECTION 3

SUPPORT ACTIVITIES

Activities to be undertaken prior to the actual site work are planning, training, design, and management for the implementation of the Removal Action.

3.1 Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the schedule given in Table 3-1.

Table 3-1 - Key Milestones of Proposed Project Schedule

Accumulated	Duration (weeks)	Duration (weeks) (cumulative)
Work Plan Approval	0	0
Complete Design	35	35
Initiate Field Activities	14	49
Complete Removal Action	38	87
Final Report/ Verification	40	127

3.2 Design of the Removal Action

"Certified for Construction" documents will be prepared for implementing the Removal Action construction. These documents include detailed design drawings and performance specifications.

The design and construction involved with this Removal Action will be in accordance with the ARARs, Federal and State of Ohio Regulations, DOE Orders, FEMP Requirements, design codes and standards, and the State of Ohio Department of Transportation "Construction and Material Specifications."

Appropriate drawings will be produced on CADD equipment.

New or modified Operating Procedures will be prepared to include the new sequence of dumping, regrading, applying water and dust control agents, and compacting, including opening and closing portions of the ash pile.

Detailed performance specifications will be prepared in accordance with the Construction Standards Institute (CSI) format. These include, but are not limited to, Site Clearing, Earthwork, Silt Trap, Wind Barrier, Backfilling, Grading and Compaction, Dust Control Agents, and other related work.

3.3 Training of Personnel

All personnel working in the implementation of the Removal Action are required to be trained in accordance with the Occupational Safety and Health Act (OSHA) regulations (See Section 6) and per Section 7.4 of the site-specific Health and Safety Plan prepared for this Removal Action. RUST Engineering, as Construction Manager, is responsible for providing and verifying the necessary training.

3.4 Management

Management Roles of the Participants are as described in Section 2.5, page 2-15.

SECTION 4

FIELD ACTIONS

4.1 Implementation of Removal Action

Implementation of this Removal Action will be performed by maintenance and/or construction personnel. The specific locations of silt traps, wind barriers, and work areas will be determined during the design phase.

4.2 Maintenance

Adequate and proper maintenance is an important part of this Removal Action. Silt trap and wind barriers will be inspected and maintained periodically to ensure their performance; the dust-control agent and water will be applied as required in conjunction with regrading and compaction activities.

As the Removal Action is implemented, the Active Flyash Pile will be partitioned into an inactive area where no additional ash will be deposited and no additional grading will be performed, and an active working area where future ash will be deposited. The active and inactive areas will change as the ash pile is built up. Regrading and compaction of the active working area will be conducted periodically.

SECTION 5

SAMPLING AND ANALYSIS PLAN

Sampling and analyses are not required for this Removal Action. Surface water runoff will be monitored by the FEMP in accordance with the stormwater monitoring program established within the site-wide NPDES stormwater permit application for the FEMP.

SECTION 6

HEALTH AND SAFETY PLAN

The work to be performed will be in accordance with the task-specific Health and Safety Plan prepared for this Removal Action. A copy of this plan is available under separate cover. The Health and Safety Plan identifies and evaluates anticipated hazards associated with this Removal Action and presents work and health safety practices to mitigate exposure to these hazards. The plan is consistent with 29 CFR 1910.120 and the FEMP Site Health and Safety Plan.

SECTION 7

QUALITY ASSURANCE

The Removal Action for the Active Flyash Pile at the FEMP will be conducted in accordance with FMPC 2139, FMPC Quality Assurance Plan. The FEMP Quality Assurance Plan is based on the requirements specified in ANSI/ASME NQA-1, 1986 and Federal US EPA Guidelines QAMS-005 and meets the intent of DOE Orders 4700.1, 5400.1, 5700.6B, and 6430.1A, and Oak Ridge Order 5700.6. Quality assurance will be implemented through written and approved procedures, specifications, and related plans. Specific quality assurance requirements will be incorporated into personnel training. The FEMP will conduct periodic surveillances to verify compliance with the Quality Assurance Plan.

SECTION 8

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