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WASTE PIT AREA STORMWATER RUNOFF CONTROL REMOVAL ACTION - SUMP STATION CONSTRUCTION PHASE

04/09/92

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WASTE PIT AREA STORMWATER RUN-OFF CONTROL

REMOVAL ACTION

WORK PLAN

FEED MATERIALS PRODUCTION CENTER

Prepared by:

Westinghouse Materials Company of Ohio
Cincinnati, Ohio

For:

The United States Department of Energy
Oak Ridge Operations Office

962

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1. INTRODUCTION

Operable Unit 1 includes those facilities utilized for the storage/disposal of radiological and chemical wastes from the Feed Materials Production Center (FMPC) operations. These facilities include Waste Pits 1, 2, 3, 4, 5, and 6; the Burn Pit; and the Clearwell. Analytical results indicate that elevated concentrations of uranium are present in the stormwater run-off from the waste pits and perimeter areas. Contaminated stormwater from the waste pit perimeter areas is currently released to the environment by draining to Paddy's Run. The Remedial Investigation/Feasibility Study (RI/FS) for Operable Unit 5, Environmental Media, will consider the effects of leakage from Paddy's Run into the regional aquifer. Because of the associated potential threat to human health and the environment, the Department of Energy (DOE) is pursuing a removal action to control the stormwater run-off from this area pending the outcome of the RI/FS and the implementation of a final remedial action for Operable Unit 1 and Operable Unit 5. The scope for this removal action can be broadly defined as management of radioactively contaminated stormwater run-off from the waste pit area. Waste storage units within the waste pit area that are included in this Removal Action include six waste pits, the Burn Pit, the Clearwell, and 4 concrete storage silos.

This removal action is a component of Operable Unit 1. All activities performed under this work plan will be in accordance with the NCP and consistent with the guidance of OSWER Directive 9360.0-03B, SUPERFUND REMOVAL PROCEDURES, Rev. 3. The Consent Agreement under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 120 and 106(a) requires a work plan to be submitted for implementation of Removal Number 2, the Waste Pit Area Stormwater Run-Off Control Removal Action. This work plan satisfies that commitment.

An Engineering Evaluation/Cost Analysis (EE/CA), in accordance with 40 CFR 300.415, has been prepared to evaluate removal action alternatives using available data to support the selection of a preferred alternative. The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies include in their decision making processes appropriate and careful consideration of all environmental effects of proposed actions. The EE/CA was prepared for the purpose of integrating the requirements of both the CERCLA and NEPA.

2. BACKGROUND

2.1 Summary of the Potential Threat

Natural drainage from the waste pit area is primarily westward toward Paddy's Run. Stormwater run-off from this area contains various concentrations of uranium.

More specifically, stormwater run-off from the majority of the soil covered surfaces of Waste Pits 1, 2, and 3 currently drains by gravity to the Clearwell. Stormwater that collects in Waste Pit 5 flows by gravity via an underground line to the Clearwell. From the Clearwell, the run-off is pumped to the Biodenitrification Surge Lagoon (BSL). Stormwater that collects in waste pit 6 is allowed to accumulate and is periodically pumped to the BSL utilizing a portable pump and existing underground piping. Due to the evaporation rate, this is only pumped a few times per year.

The stormwater run-off from the remaining portions of the waste pit area flows to Paddy's Run. Several of these areas have been shown to produce contaminated stormwater run-off. Upon entering Paddy's Run, the potential exists for these contaminants to migrate to the Great Miami Aquifer. This aquifer is within the buried valley aquifer of the Great Miami River Basin, which has been designated as a Sole-Source Aquifer by the EPA under Section 1424(e) of the Safe Drinking Water Act. Under this designation, the Regional Administrator of Region V of the EPA has determined that this aquifer is the sole or principal source of drinking water for this area. Contamination of Paddy's Run and/or the underlying aquifer may pose potential exposure risks to public health and the environment. The areas that produce contaminated stormwater run-off are planned to be controlled by the preferred alternative which was identified in the EE/CA.

Exposure to the contaminants in the stormwater run-off can occur as a result of the release of these contaminants to Paddy's Run. The contaminants may then be discharged from Paddy's Run to the Great Miami River or the underlying sand and gravel aquifer. Paddy's Run is not used as a drinking water supply. Ingestion of sediment from the stream is considered a potential exposure pathway for children. Ingestion of groundwater from the aquifer underlying Paddy's Run is an additional potential exposure pathway. Other exposure pathways associated with the groundwater include ingestion of crops irrigated by the water, ingestion of beef from cattle exposed to uranium through

water and crops, and ingestion of milk from cows exposed to uranium through water and crops.

2.2 Related Actions

Past

In 1986 a project was initiated to control the stormwater run-off from the Plant 1 Storage Pad area (PA 40-86602 - Surface Water Control of Plant 1 Storage Pad). Prior to the completion of this project, stormwater run-off from several portions of the Plant 1 Storage Pad flowed to Paddy's Run via drainage ditches within the Waste Pit Area. The implementation of this project redirected the stormwater flows from these portions of the Plant 1 storage pad to the site Storm Sewer System. This was accomplished by modifying a portion of the storage pad to include a curb around the periphery to keep stormwater confined to the existing pad drainage system. The drainage line from this drainage system was redirected from its previous termination point which flowed to the Waste Pit Area and directed to the Storm Sewer System. Also, northern sections of the storage pad that flowed over the grassy area to the west and then through the Waste Pit Area were redirected to the Storm Sewer System. This was accomplished by plugging the culvert that led to the Waste Pit Area and reversing the drainage ditch flow. A new storm sewer inlet was then added to accommodate these flows. This project was completed in October of 1988.

This project was related to the Waste Pit Area Stormwater Run-Off Control Removal Action in that it stopped the flow of contaminated stormwater run-off from the process area to the waste pit area and ultimately to Paddy's Run. The specific impact is that these actions limited the scope of this Removal Action to the areas surrounding the six waste pits, the Burnpit, the Clearwell, and the four concrete storage silos.

Present and Future

This Removal Action was originally a task in a subproject of a larger Line Item Project - "Environmental Safety and Health Improvements". This subproject entitles "Waste Water Treatment Improvements - Plant wide" includes four Tasks:

Task 1	Waste Pit Area Stormwater Run-Off Control
Task 2	Process Area Stormwater Run-Off Control Improvements
Task 3	Advanced Waste Water Treatment Facility (AWWT)
Task 4	Water Recycle and Reuse.

Task 1, Waste Pit Area Stormwater Run-Off Control, is the subject of this work plan and will be completed prior to the completion of Tasks 2 through 4. Because this ongoing project was closely related to Operable Unit 1, and would be required in some form for any final remediation activities taking place under Operable Unit 1, a decision was made to make this ongoing project a Removal Action. A schedule for its completion is included as Attachment I.

Tasks 2 through 4 remain ongoing projects at the FMPC, however the scopes and schedules of these line item tasks are subject to changes.

2.3 Roles of the Participants

The DOE, as the lead agency, will coordinate and execute this removal action. The U.S. EPA and the Ohio Environmental Protection Agency (OEPA) roles have been one of providing guidance and participation in the preparation of the CERCLA 120 Consent Agreement and technical information exchanges.

The U.S. EPA has reviewed and conditionally approved the EE/CA document identifying the selected removal alternative for the Waste Pit Area Stormwater Run-Off Control Removal Action. The U.S. EPA has approval authority for this Work Plan.

ASI, as a contractor to DOE, is conducting the RI/FS program including preparation of the South Plume Removal Action EE/CA and through their subcontractor, IT Corporation, providing analytical services.

WMCO, as the FMPC Operating and Maintenance contractor, is responsible to implement this removal action in a manner consistent with DOE and regulatory guidance.

A.M. Kinney, Inc., as the design consultant, is responsible for the preparation of the design plans and specifications.

2.4 Removal Action

The preferred alternative, identified in the EE/CA, incorporates planned separation of drainage areas within the waste pit area, thus isolating contaminated from noncontaminated stormwater run-off. Contaminated stormwater will continue to be collected in the existing Clearwell; and, additional contaminated stormwater will be collected in a new collection sump and pumping station that will be located south of the Clearwell. Drainage flow control devices will be installed in upstream drainage channels, located in the waste pit storage area, to restrict peak flows to the new pumping station. The new system will pump the collected stormwater run-off to the BSL, where suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water treatment system.

In a proposal dated September 28, 1990, the DOE offered to construct a 150 gpm wastewater treatment system which will treat FMPC effluent prior to being discharged to the Great Miami River. In a letter dated October 25, 1990, the U.S. EPA accepted this proposal. It was agreed that this interim treatment unit will remain in operation until the advanced wastewater treatment (AWWT) system comes on-line.

2.5 Integration with the Final Remedial Action

The Waste Pit Area Stormwater Run-Off Control Removal Action is consistent with all final remedial action alternatives for Operable Unit 1. The final remedial action alternatives that are being considered include the following:

- Nonremoval, Physical Stabilization, Slurry Wall and Cap.
- Removal, Sludge Treatment, and On-Site Disposal.
- Removal, Sludge Treatment, and Off-Site Disposal.

All of these final remedial action technologies will require some degree of stormwater run-off control and will benefit from the implementation of this removal action.

The Waste Pit Area Stormwater Run-Off Control Removal Action will be implemented far in advance of any of the alternatives for final remediation of Operable Unit 1. Therefore, no scheduling conflicts are anticipated.

3. SUPPORT ACTIVITIES

3.1 Project Planning Activities

Activities that will be undertaken prior to the actual site work are planning, training, design, and management of the removal actions preparatory efforts. These activities are required to render the area reasonably free of hazard to personnel and/or the environment until the RI/FS process has been completed and to determine if further action is required.

The following distinct engineering phases will be performed by WMCO to provide the necessary definition for development of accurate scope, cost, and schedule documents:

a. Project Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the schedule given in Attachment I. Specific items will be made available to the U.S. EPA upon completion of the engineering phases of the scope of work. These items will include information regarding the discussion of a preliminary operations and maintenance manual, cost estimate, and detailed schedule indicating project planning activities.

b. Design of Removal Action

Definitive design documents will be prepared for the removal action construction work.

c. Training of Personnel

All personnel involved will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120.

d. Bid and Award/Construction Management

All bid and award documents will be prepared for the removal action construction work along with the procurement of all equipment, materials and subcontractors necessary to complete the removal action construction work.

3.2 Training Requirements

All personnel involved with the implementation of this removal action will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120, radiation worker training, and respirator training and fit testing.

4. FIELD ACTIONS

Construction of this project will include concrete drainage ditches, dikes, culverts, and existing topographic features to collect the waste pit perimeter area stormwater run-off. A concrete collection sump will be installed south of the existing Clearwell to collect contaminated stormwater run-off and pump to the BSL. Stormwater will flow to the sump by means of installed concrete trenches, berms, and/or ditches. The stormwater run-off from other areas of the waste pit area, which are not contaminated, will be rerouted away from the contaminated waste pit perimeter drainage areas, and will continue to flow by gravity to Paddy's Run. Several drawings (C-1, C-2, and C-3) have been included from the current design package to illustrate the field actions involved in this removal action. Drawing C-2 includes a construction sequence for the major construction activities included in this removal action. The design of this project, to date, was completed by A.M. Kinney, Inc. A full set of design drawings was prepared to support the line item project, but have not been included since the level of detail exceeds that required for this Work Plan. The design package will be modified to reflect the provisions of the approved EE/CA document.

Flow control equipment will be installed to regulate the flow of run-off water to the collection sump during periods of heavy rain. Much of the area directly over the waste pits is presently collected and pumped to the BSL. The basin will contain a pump pit area equipped with a sump pump to empty the pit area for maintenance.

Four submersible 700 gpm pumps will be located at the pumping station. The system has been designed so that three of the four pumps will handle a 25-year rainfall event. The fourth pump will remain in standby, but is capable of being used in an emergency, such as if an overflow is imminent. These will pump the collected stormwater from the basin to the BSL.

A 12-inch underground force main will be installed from the pump station to the BSL. At the BSL, the force main will run aboveground over the berm of the BSL. The force main is provided with a back drain valve that will open when the pumps are shut off at low level. This will allow the main to drain back to

the sump to prevent freezing and eliminate the need for heat tracing the force main.

Wetlands on the FMPC site are being delineated as part of the RI/FS. Preliminary results indicate that the impacted area is small. Implementation of this removal action will result in a short-term disturbance during construction; the area disturbed will be allowed to revegetate after construction and the long-term impacts will be minimal.

The implementation of this system will consist of separate types of construction activities. These activities and a brief explanation of each are detailed below and are similarly discussed in the Health and Safety Plan (Attachment III):

Installation of drainage ditches, dikes, and culverts. This portion of the removal action will involve trenching and excavation activities that will facilitate the installation of stormsewer sections, culverts, and concrete drainage ditch sections.

Installation of inlet flow control and overflow structures. This portion of the removal action will involve excavation activities to support the installation of two concrete inlet flow control structures and one overflow stand pipe.

Installation of the new collection sump and associated equipment. This portion of the removal action will involve the most extensive excavation. The excavation will be large enough to facilitate the construction of the collection sump. The approximate dimensions of the excavation for this collection sump are 60′ wide x 110′ long x 15′ deep. This portion of the removal action will also include the installation of the pumps, piping, and instrumentation for the operation of this system. Installation of the collection sump will include relocation of a portion of the perimeter roadway. Also, installation of the trailer mounted pilot scale treatment unit will be included in this portion. This unit shall conform to all FMPC standards, including IHS-F-06.

Installation of the underground force main. This portion of the removal action involves the installation of the underground force main piping from the collection sump and pump station to the BSL.

It should be noted that the current project design may require modification. Modification of the design may be required to ensure that a maximum permeability of 1×10^{-7} cm/sec is achieved in the two detention areas. If existing conditions do not achieve this permeability, modifications to the soils in the detention areas will be required.

Operations and Maintenance

After construction is complete and after WMCO completes the start up testing period the system will be operated and maintained by WMCO Operations. WMCO Operations will be responsible for the operation, monitoring and maintenance of the system. Existing WMCO utilities operators will control this system. The Utility Engineers will be assigned as the supervisory responsibility for to this system and will be available on site at all times. Site Standard Operating Procedures (SOPs) will be developed that will cover the operation and maintenance of the system.

5. SAMPLING AND ANALYSIS PLAN

The stormwater run-off from portions of the Waste Pit Area has been determined to have elevated concentrations of uranium, warranting this removal action. In addition, sampling and analysis of the soils in areas that will be involved in construction activities has been performed.

Additional sampling and analysis, including the verification of a maximum permeability of 1×10^7 cm/sec in the detention areas, will be performed to support the implementation of this removal action. Proposals will be requested of experienced geologic consultants for the purpose of verifying this permeability. The selected consultant will perform both field and laboratory tests for verification of the permeability factor. A copy of the specific sampling and analysis plan for the implementation of this removal action is presented as Attachment II.

6. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the Health and Safety Plan prepared for this removal action. It is provided as Attachment III of this work plan. The plan identifies, evaluates, and controls all identified safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FMPC Site Health and Safety Plan. Safety documentation will be prepared according to FMPC-2116 Topical Manual "Implementing FMPC Policies and Procedures for System Safety Analysis." FMPC-2116 has been prepared to implement DOE Order 5481.1B Safety Analysis and Review System and DOE/OR-901 Guidance for Preparation of Safety Analysis Reports."

7. QUALITY ASSURANCE

The overall quality assurance program at the FMPC is described in the site Quality Assurance Plan, FMPC 2139. The Quality Assurance Plan is based on

the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. Specific quality assurance requirements will be incorporated into written and approved procedures and into personnel training. The WMCO Quality Department will conduct surveillance and inspections and/or audits to verify compliance throughout the execution of this Removal Action.

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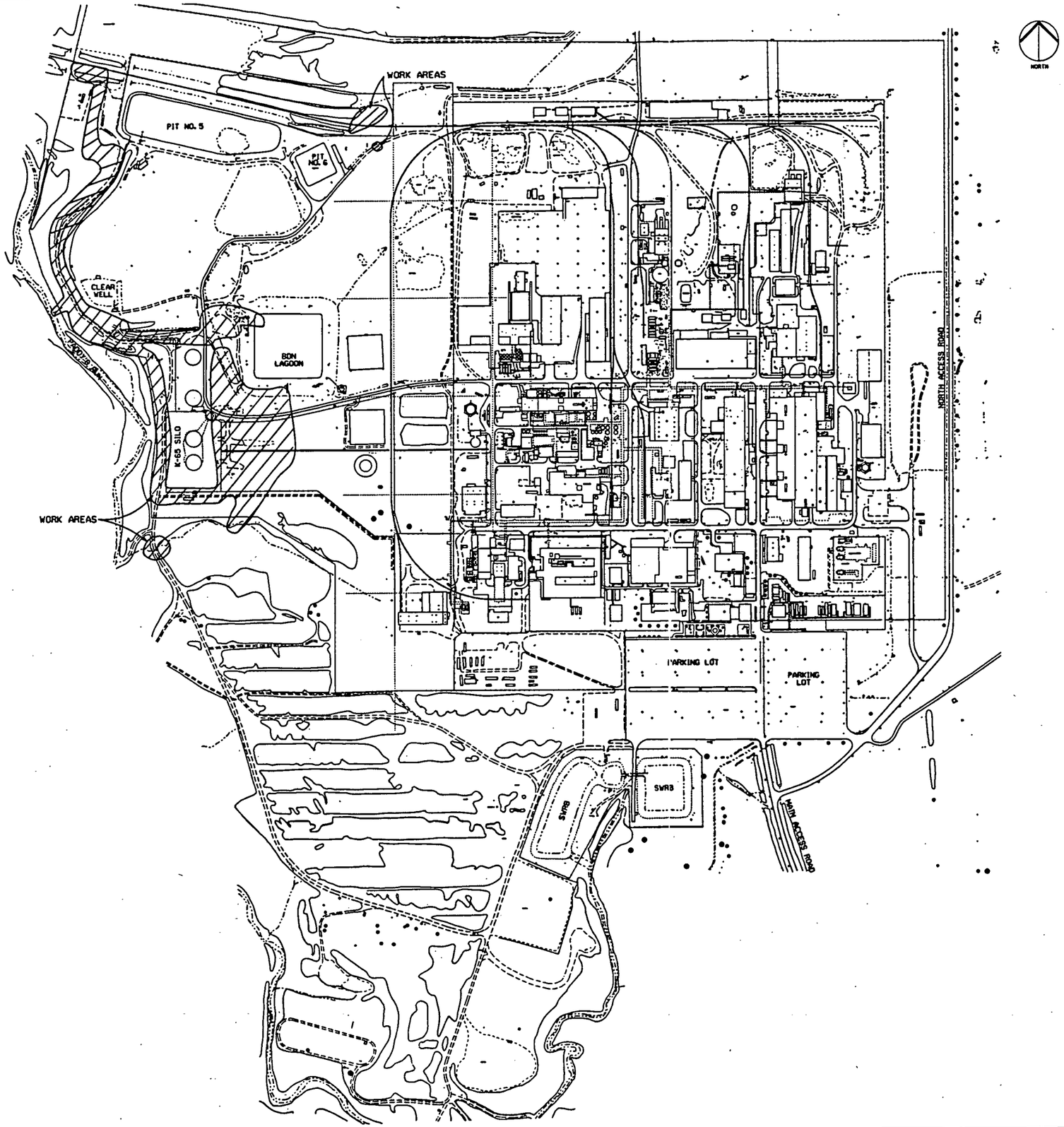
DRAWINGS

1. C-1 Key Plan
2. C-2 Location Plan
3. C-3 Site Plan



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NOTES

REV. NO.	REVISIONS PURPOSE - DESCRIPTION	DRAWN	CHK	APPR
0	CFC	7-30-89 RPD		

UNITED STATES DEPARTMENT OF ENERGY
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THIS DRAWING PREPARED BY
A. M. KINNEY, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

FMPC SUBCONTRACT NO. P-77297 — A-E PROJECT NO. 02702

PROJECT NAME
ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

DRAWING TITLE
WASTE PIT AREA STORMWATER CONTROL
KEY PLAN

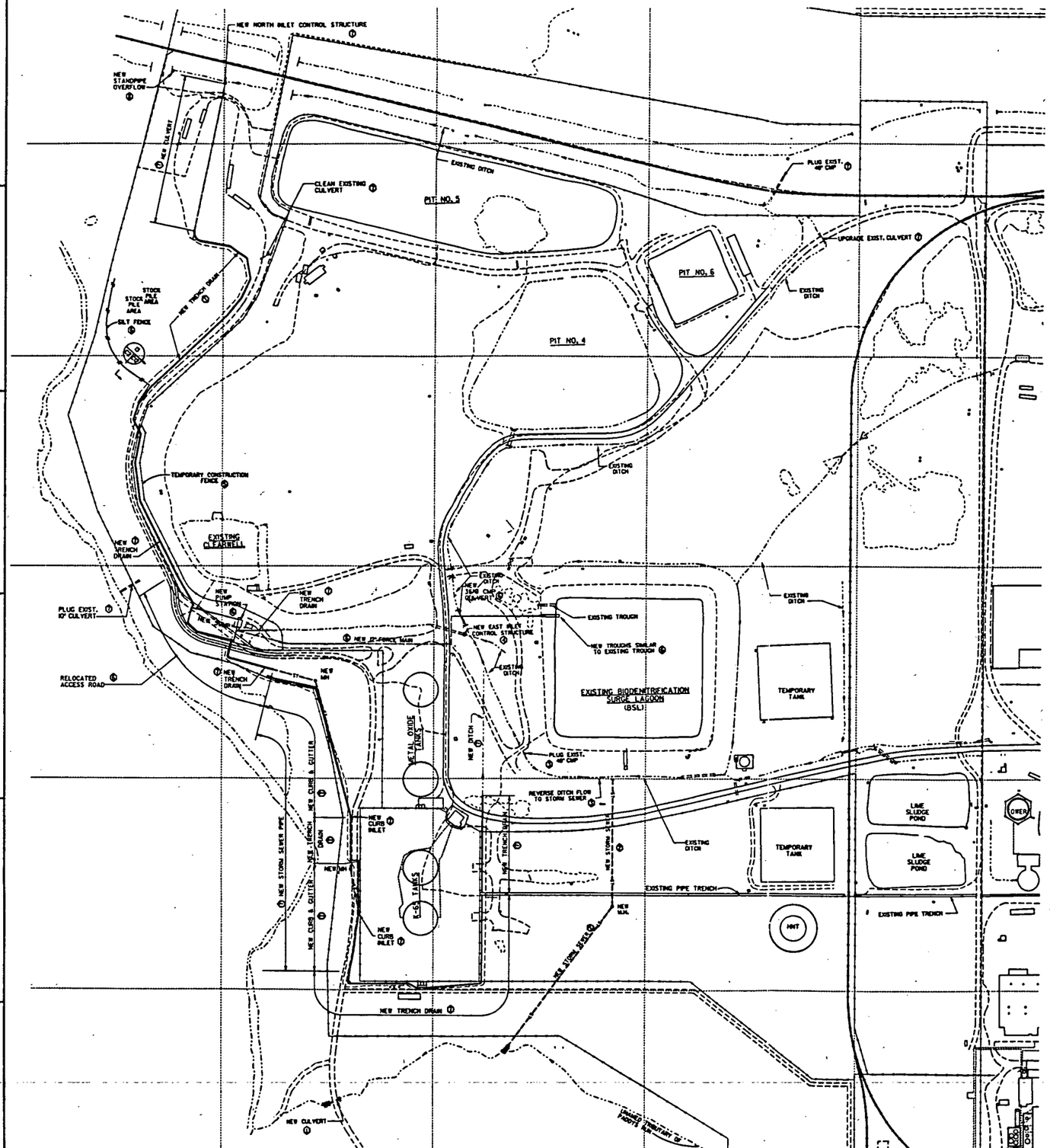
DRAWN BY	DATE	DESIGNED, CHECKED BY	DATE	CHECKED BY	DATE
MEC	10-89	RPD	10-89	WGI	11-89

PURCHASE NO. FMPC — FLOW — SCALE 1" = 200' — CLASS

SUBMITTED FOR APPROVAL: O.W. Johnson 11-20-89 — APPROVAL RECOMMENDED — DRAWING APPROVED

OPERATING CONTRACTOR — DATE — SIGN — DATE

A-E PROJECT NO.	DATE	SPEC. CONTR. PROJ. NO. / DRAWING NO.	SHEET NO. OF	REV. NO.
87-D-159		0087502 WBS 1.1.2.4.01 — 40A-4445-C-00054	C-1	0



LEGEND

	NEW	EXISTING
DITCHES		
CULVERTS		
STORM SEWER		
TRENCH DRAINS		
DRAINAGE AREA LIMITS		
SILT FENCE		
CONSTRUCTION FENCE		

NOTES

CONSTRUCTION SEQUENCE

1. INSTALL NEW CULVERT UNDER THE EXISTING ENTRANCE ROAD AND PLACE ROCK CHANNEL PROTECTION AS INDICATED.
2. CONSTRUCT NEW STORM SEWER FROM A POINT SOUTH OF EXISTING BIODENITRIFICATION LAGOON, UNDER THE EXISTING PIPE TRENCH, AND DISCHARGING INTO AN UNNAMED TRIBUTARY OF PADDYS RUN. PLACE ROCK CHANNEL PROTECTION AS INDICATED.
3. PLUG EXISTING 48" & CMP CULVERT, LOCATED NEAR THE SOUTHWEST CORNER OF THE EXISTING BIODENITRIFICATION LAGOON AND REGRADE TO REVERSE DITCH FLOW TOWARDS THE NEW STORM SEWER.
4. CONSTRUCTION NEW EAST INLET CONTROL STRUCTURE.*
5. ERECT TEMPORARY CONSTRUCTION FENCE, REMOVE EXISTING ROADWAY AND PROVIDE TEMPORARY ACCESS ROAD TO THE EXISTING TRAILERS LOCATED NEAR THE NORTHWEST CORNER OF THE WASTE PIT AREA.
6. ERECT SILT FENCE AROUND DOWNSTREAM END OF STOCKPILE AREA AND CONSTRUCT NEW SUMP,* PUMP STATION, FORCE MAIN, CULVERT UNDERFORCE MAIN, AND CONSTRUCT RELOCATED ROADWAY. THIS UNIT IS TO BE TOTALLY OPERATIONAL BEFORE PROCEEDING WITH ANY TRENCH CONSTRUCTION.
7. REMAINDER OF CONSTRUCTION, EXCEPT FOR NEW STANDPIPE OVERFLOW, INCLUDING TRENCH DRAINS, STORM SEWERS, CULVERTS AND THE NORTH INLET CONTROL STRUCTURE.*
8. CONSTRUCT NEW STANDPIPE OVERFLOW.

*PROVISIONS SHALL BE MADE TO HAVE A QUALIFIED GEOTECHNICAL ENGINEER INSPECT ALL FOOTING EXCAVATIONS TO ASCERTAIN THE SUITABILITY OF THE FOUNDING SOIL OR ROCK FOR THE 3000 PSF BEARING CAPACITY. IN ADDITION, THE GEOTECHNICAL ENGINEER SHALL CONDUCT THE NECESSARY SUBSURFACE EXPLORATION, TESTING PROGRAM, AND FOUNDATION ANALYSIS TO DETERMINE THE MAXIMUM LONG TERM SETTLEMENT AND MAXIMUM DIFFERENTIAL SETTLEMENT FOR THE CONCRETE SUMP AND THE FLOW CONTROL STRUCTURES. BASED ON THE GEOTECHNICAL REPORT, THE A/E ENGINEER WILL CONFIRM THE FOUNDATION DESIGN.

REV. NO.	DESC. OF REVISION PURPOSE - DESCRIPTION	A-E	DRAWN	DATE
0	CFC		9-30-89 RPD	

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WACO SUBCONTRACT NO. H-77207 — A-E PROJECT NO. 02902

PROJECT NAME
ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

DRAWING TITLE
WASTE PIT AREA STORMWATER CONTROL
LOCATION PLAN

DRAWN BY	DATE	DESIGNER CHECKED BY	DATE	CHECKED BY	DATE
WEC	10-89	RPD	10-89	WGI	11-89

PLANT/FACIL NO. FMPC — FLOOR — SCALE 1" = 100' — CLASS

SUBMITTED FOR APPROVAL — APPROVAL RECOMMENDED — DRAWING APPROVED

A.V. Ofirmann 11-30-89

DOE PROJECT NO.	SPEC CONTR. PROJ. NO.	DRAWING NO.	SHEET NO.	REV. NO.
87-D-159	0087502 WBS 1.2.4.01	40A-4445-C-00055	C-2	0

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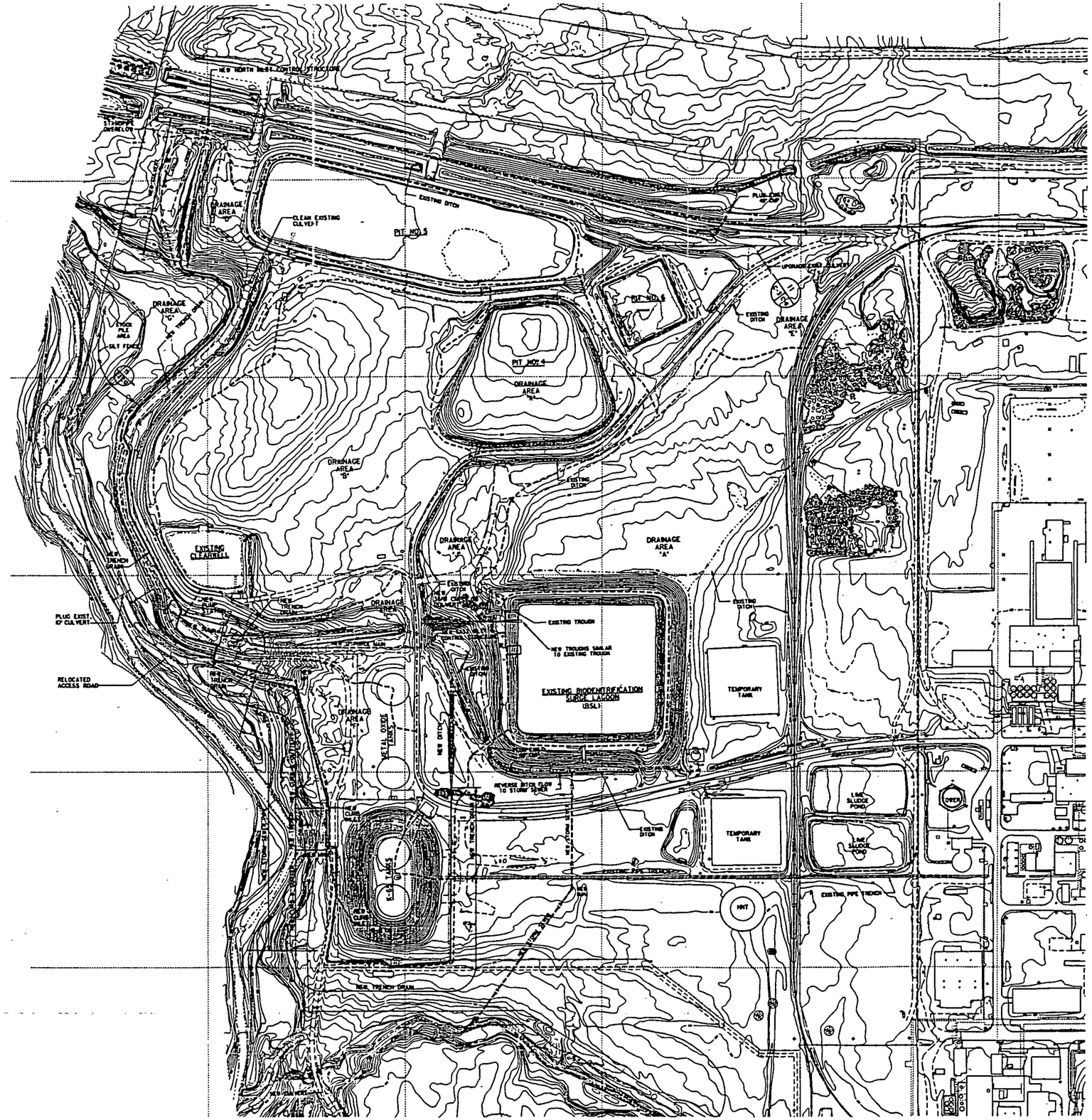

NOTES

1. FOR DETAIL LAYOUT OF NEW DRAINAGE SYSTEM SEE SHEET NOs. C-4 THRU C-6.

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REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	DRAWN	DESIGNED	CHK
0	CFC	11-30-89 RPD		

DETAILS AND DATE

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CINCINNATI, OHIO

WACO SUBCONTRACT NO. W-FT207 — A-E PROJECT NO. 029102

PROJECT NAME
ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

DRAWING TITLE
WASTE PIT AREA STORMWATER CONTROL SITE PLAN

DRAWN BY	DATE	DESIGNED, CHECKED BY	DATE	CHECKED BY	DATE
MEC	10-89	RPD	10-89	WGI	11-89

PLANT/PROJ. NO.: FMPC — FLOOR: — SCALE: 1" = 100' — CLASS:

SUBMITTED FOR APPROVAL: O.N. Glenn 11-30-89 — APPROVAL RECOMMENDED: — APPROVAL GRANTED:

DATE — OPERATING CONTRACTOR — DATE — DOE — DATE

DOE PROJECT NO.	SPEC/CONTR PROJ. NO.	DATABASE NO.	SHEET NO.	REV. NO.
87-D-159	0087502 WBS 1.1.2.4.01	40A-4445-C-00056	C-3	0

LEGEND

	NEW	EXISTING
DITCHES		
CULVERTS		
STORM SEWER		
TRENCH DRAINS		
DRAINAGE AREA LIMITS		
SILT FENCE		
CONSTRUCTION FENCE		

NUMBER OF SECTION OR LETTER OF DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS TAKEN
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN
SECTION & DETAIL KEY

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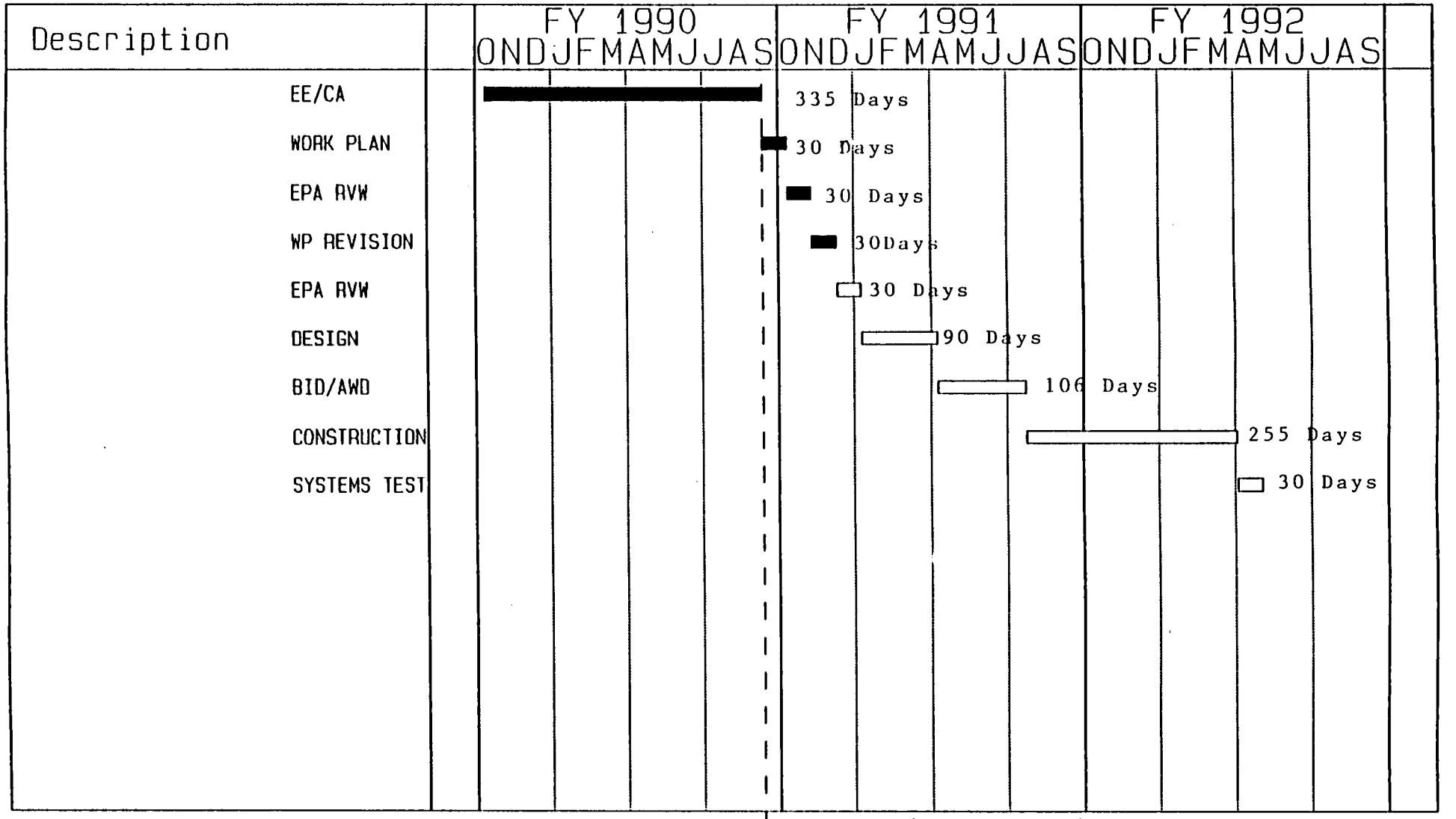
ATTACHMENT I

WASTE PIT AREA STORM WATER RUN-OFF CONTROL

REMOVAL ACTION SCHEDULE

WASTE PIT AREA STORM WATER RUN-OFF CONTROL SCHEDULE

FMPC



Duration in Calendar Days

12 September 90 (USEPA Approve EE/CA)

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ATTACHMENT II

SAMPLING AND ANALYSIS PLAN

SAMPLING & ANALYSIS PLAN

FMPC WASTE PIT AREA STORMWATER RUNOFF CONTROL PROJECT

1.0 PURPOSE OF SAMPLING

The Waste Pit Area Stormwater Run - Off Control Project will be implemented in several varying phases of construction as outlined in the removal action work plan. Preliminary sampling conducted by ATEC Geological, and FMPC Environmental has provided critical data as to the preconstruction characterization of the existing area soils involved in this removal action. This data will be utilized as a basis to determine the amount and frequency of representative sampling needed to monitor all project activities to support the actual construction and postconstruction phases of this project.

This project will be completed in varying phases. The construction activities are as follows:

a. Installation of drainage ditches, dikes and culverts. (As outlined in the actual work plan this phase of construction will involve trenching and excavation activities that will support the installation of storm sewer sections, culverts, and concrete drainage ditch sections).

Approximate Extent of Excavations are as follows:

*	New Trench	0' - 3' deep
*	New Culvert	0' - 12' deep
*	New Storm Sewer	0' - 10' deep
*	New Trench Drain, Curb and Storm Sewer	0' - 12' deep

Approximate Extent of Excavations are as follows:

*	New Culvert	0' - 8' deep

b. Installation of inlet flow control and overflow structures. (This phase of the planned construction will involve excavation that will allow for the installation of two inlet flow control structures and one overflow stand pipe).

c. Installation of the new collection sump and associated equipment. (Excavation in support of this phase will be in an area approximately 60' wide x 110' long x 15' deep and will be located south of the existing clearwell.

d. Installation of the underground force main (12" Force Main 0' to 8' excavation depth).

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Preconstruction sampling has provided the Solid Waste Compliance department with information necessary to determine the actual characterization of the soils in the proposed areas of construction. The purpose of any further sampling by Environmental Monitoring would be to support the construction and post construction phases of this project and to provide samples to support the final remediation of Operable Unit One.

The objective of environmental sampling is to verify compliance with the FMPC Excavation and Demolition CERCLA Integration Plan. In accordance with FMPC 720, Environmental Monitoring would (1) conduct sampling that would continue to verify the extent of the primary contaminants of concern which are radiological according to the RCRA determination by Solid Waste Compliance. This sampling would support the controls that are needed to minimize or alleviate the threat of exposure to employees from radiological contaminants. (2) Conduct postconstruction verification sampling. This sampling would employ direct radiological field measurement of the newly constructed areas, along with the directed sampling of the involved soils as indicated by the radiological field measurements.

2.0 SAMPLING AND ANALYSIS PLAN

The results of the preliminary round of sampling to date have primarily been used to estimate the volume of contaminated construction rubble, the disposition of construction rubble, and will also be used to assist in the establishment of work exclusion zones. This initial round of sampling focused on surface and subsurface soils in the areas of concern. Finalized data from the initial round of sampling was submitted to the FMPC Solid Waste Compliance department for review. The conclusions drawn from this data has characterized the soils in the proposed construction area to be non (RCRA) hazardous. However some areas of the construction site have radiological constituents that must be addressed.

The Waste Pit Area Stormwater Runoff Control Project is the proposed removal action and interim solution to the release of contaminants to Paddy's Run. This project involves major construction activities as listed in 2.0 of this sampling and analysis plan. Removal and movement of soil associated with this project shall be minimized as much as possible. Environmental Monitoring will conduct sampling that will assure that contaminated soils removed to support build-over are extracted down to an activity level of 35 pCi/gm of total uranium. Build-over is defined as the construction of a permanent structure over the affected area. This will assure that the build-over criteria is in accordance with the NRC recommended guidelines for the disposal or on-site storage of thorium or uranium wastes.

Verification of the 35 pCi/gm total uranium build-over criteria shall be accomplished prior to the actual construction activity. This can be achieved by (1) performing radiological survey measurements during the excavation process, and (2) the collection of statistically representative verification soil samples from the base of each of the excavation areas that have elevated concentrations of uranium in the preconstruction sampling.

Postconstruction sampling shall also be conducted by Environmental Monitoring to confirm that the suspect contamination has been contained to less than or equal to the 35 pCi/gm concentration level for total uranium. This phase of sampling will be performed by establishing a grid over the affected project areas. Statistically representative soil samples (0" to 6") will be collected from within each grid. The collected samples will be submitted to the FMPC analytical department for the following analysis.

* Total Uranium (ppm)
* Total Thorium (ppm)

In addition to the above analysis, a sample from 10% of the locations selected will be analyzed for the following. The projected analyses are as follows:

* Total Uranium (pCi/gm)
* Isotopic Uranium (pCi/gm)
* Total Thorium (pCi/gm)
* Isotopic Thorium (pCi/gm)
* Full HSL

Container requirements, weighted volumetric specifications, and holding times for the suggested radiometric analysis are as follows: **(g/p = glass or plastic, N/A= not available)**

PARAMETER	VOLUME	CONTAINER	HOLDING TIME
Total Uranium	30 gm.	g/p	N/A
Isotopic Uranium	200 gm.	g/p	3 months
Total Thorium	30 gm.	g/p	N/A
Isotopic Thorium	40 gm.	g/p	3 months

Full Hazardous Substance List

HSL METALS	2-1 liter	g	6 months (28 days for Hg)
HSL SEMI-VOAs	4 liter	g, tlc	7 days
HSL VOAs	2-40 ml vial	g, tlc	7 days
HSL PEST/HERB	4 liter	g, tlc	7 days

The requested analysis shall be performed by the FMPC analytical department for process control. All environmental monitoring verification samples will be submitted to an appropriate off-site, QAPP identified, analytical laboratory licensed to accept and analyze low level nuclear material and identified in the RI/FS QAPP. Any sample analysis that cannot be performed by the FMPC analytical department will also be shipped off-site to an appropriate laboratory for the completion of analysis.

3.0 CONSTRUCTION GENERATED RUBBLE SAMPLING AND ANALYSIS PLAN

The FMPC defines construction rubble to include soil, rubble, wood, general refuse, metal, etc., generated during the course of any construction project. In order to dispose of this waste, materials are determined to be either contaminated or non contaminated.

All material excavated in the support of the Waste Pit Area Stormwater Control Project must meet one of three criteria. (1) Excavated soils that are 35 pCi/gm or less can be used as backfill in the uncontrolled area of the FMPC or stockpiled in the K-65 Storage Area. (2) Soils greater than 35 pCi/gm but less than 100 pCi/gm, can be used as backfill in the controlled area or stockpiled in the controlled area. (3) Soils in excess of 100 pCi/gm must be packaged for disposal as low level waste.

Excavated material (soil, concrete, etc.) that cannot be utilized in the completion of this project and exhibit an activity level of greater than or equal to 100 pCi/g of total uranium shall be containerized for storage. Generated wastes that exhibit total uranium activity levels equal to or greater than 35 pCi/g but less than 100 pCi/g shall be segregated and stockpiled in a controlled area.

The characterization of stockpiled and/or containerized stored wastes shall be accomplished by extracting statistically
representative samples to determine the radiological and chemical characteristics of the suspect material.

All extracted samples shall be analyzed for the following analytical parameters:

* Total Uranium
* Isotopic Uranium
* Total Thorium
* Isotopic Thorium
* Full TCLP

Container requirements, weighted volumetric specifications, and holding times for the suggested radiometric analysis are as follows: **(g/p = glass or plastic, TLC = teflon lined closure, N/A= not available)**

PARAMETER	VOLUME	CONTAINER	HOLDING TIME
Total Uranium	30 gm.	g/p	N/A
Isotopic Uranium	200 gm.	g/p	3 months
Total Thorium	30 gm.	g/p	N/A
Isotopic Thorium	40 gm.	g/p	3 months
Full TCLP			
TCLP METALS	1 pint	g/p, tlc	6 months (28 days for Hg)
TCLP SEMI-VOAs	1 pint	g, tlc	14 days
TCLP VOAs	2 - 4 oz.	g, tlc	14 days
TCLP PEST/HERB	1 pint	g, tlc	14 days

The analysis for radiometric parameters shall be conducted by the FMPC analytical department. The full TCLP, analysis shall be conducted by an off - site analytical laboratory contracted by the FMPC. Analytical test methods shall be those consistent with analytical test protocols established by EPA document SW-846, **Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods.**

4.0 QA/QC SAMPLING REQUIREMENTS

Environmental monitoring will be conducted in accordance with the RI/FS QAPP. The procedure, EM-2-013 will be made to conform to the QAPP for trip blanks, field blanks, and duplicate sampling. Steps will be taken to separate the samples in order to be sent to off-site labs. Regardless of sample matrix, EM will extract a duplicate of every tenth sample for analysis. The sample will be noted in the field logbook as applicable to the specific project. All duplicate or QA/QC samples will be contained, sealed and labeled in such a way that the receiving lab will not know that the sample is a duplicate.

5.0 EQUIPMENT NEEDED

As a minimum the required equipment and associated forms needed will be those listed in Environmental Monitoring procedure **EM-2-013**. This list of equipment and forms may be added to or deleted from as directed by the needs of the specific project.

6.0 DECONTAMINATION OF EQUIPMENT

All equipment used will be decontaminated as per Environmental Monitoring procedure **EM-2-013**. In accordance with EPA document SW-846 and Environmental Monitoring procedure **EM-2-013** a final rinseate sample will accompany all sampling conducted in the support of the project to confirm that suspect contamination is not being transported to other sample locations.

7.0 METHODOLOGY OF EXTRACTION

Environmental Monitoring will adhere to the following methodologies of extraction EM-EXM-90-001 (Environmental Media Sampling Extraction Methodology For Using a Stainless Steel Auger and A Stainless Steel Scoop) and EM-EXM-90-006 (Environmental Media Sampling Extraction Methodology Using the Environmentalist Subsoil Probe). These procedures are attached.

EM-EXM-90-001
REV- 1

ENVIRONMENTAL MEDIA SAMPLING EXTRACTION METHODOLOGY FOR USING A STAINLESS STEEL AUGER AND A STAINLESS STEEL SCOOP

PREPARED BY Lawrence Love Jr. DATE: Sept. 28, 1990
(TECHNOLOGIST)

REVIEWED BY [illegible] DATE: 10/1/90
(SR. TECHNICIAN)

APPROVED BY [illegible] DATE: 10-1-90
(MANAGER)

1.0 PURPOSE

To establish a methodology for extracting samples of the native soils at the FMPC using a stainless steel auger and a stainless steel scoop.

2.0 DEFINITIONS

2.1 EMS - Environmental Media Sampling

2.2 EMS Sample Label - The form of identification attached to an individual sample .

2.3 EMT - Environmental Monitoring Technician

2.4 Sample Location - An area designated as a location to obtain a sample of the Native Soil and shall be an area approximately 12" by 12" square. Each sample location may have varying sample depths according to project requirements.

2.5 Sample Point - An area designated within a sample location where as a sample of the native soil will be extracted.

2.6 Surface Soil Sample (point #1) - Shall be that amount of material collected from 0" to 6" depth of the native soil at any sample location. It shall be described on the sample identification label as depth 0.

2.7 One Foot Depth Soil Sample (point #2) - Shall be that amount of material collected from an area one inch contiguous to the surface soil sample extraction at a sample location. A one foot depth sample will be that amount of material extracted from 0" to 12" depth. It shall be described on the sample identification label as depth 1.

2.8 Two Foot Depth Soil Sample (point #3_ - Shall be that amount of material collected from 12" to 24" in the same location as the one foot soil sample extraction. It shall be described on the sample identification label as depth 2.

2.9 Three Foot Depth Soil Sample (point #4) - Shall be that amount of material collected from 24" to 36" in the same location as the one and two foot soil sample extraction. It shall be described on the sample identification label as depth 3.

3.0 METHODOLOGY

3.1 In accordance with site policy and procedure **FMPC-720** the EMT Senior Technician and cognizant project engineer shall locate and perform a walkdown and visual inspection of area are equipment to be sampled.

3.2 The EMT Technologist and or Senior Technician will notify Industrial Hygiene, Safety, and Radiological Safety so that appropriate surveys may be performed involving area or equipment to be sampled.

3.3 Prior to sampling the EMT senior Technician and field sampling team will perform a walkdown and visual inspection of the area are equipment to be sampled.

3.4 Before any sample extraction is performed the EMT technician shall prepare the area to be sampled in accordance with procedure **EM-2-013.**

3.5 When the sample location(s) have been identified as per procedure **EM-2-013.** The EMT technician wearing disposable

latex gloves and using a pair of grass shears shall clear the sample location of all grass to expose the soil surface.

3.6 Using a stainless steel scoop the EMT, wearing disposable latex gloves will extract enough soil (approximately 300 grams) from the 0" to 6" depth and place in a stainless steel pan. This material (soil) shall represent the surface soil sample.

3.7 The EMT, wearing disposable latex gloves, will thoroughly mix all material in the stainless steel pan using a stainless steel scoop. As the material (soil) has been thoroughly mixed, a composite of the sample will be extracted (approximately 300 grams) using the stainless steel scoop, and placed in an appropriate container. **Containers used will be those specified in SW-846, Required Containers, Preservation Techniques, and Holding Times.** The container shall be closed, labeled and sealed as per procedure **EM-2-013.** Any remaining material (soil) shall be placed in a plastic bag until all sample points at the sample location have been extracted. (see paragraph 3.14)

3.8 When the surface sample has been extracted, the EMT shall move to a location 1" contiguous to the surface soil sample extraction. At this point the EMT, wearing disposable latex gloves, will advance a stainless steel auger into the ground to a depth of 12" (one foot). All soil collected at this depth shall be deposited in a stainless steel pan.

3.9 The EMT wearing disposable latex gloves, will thoroughly mix all material in the stainless steel pan using a stainless steel scoop. As the material (soil) has been thoroughly mixed, the EMT using the stainless scoop shall extract a composite of the sample (approximately 300 grams) and place in an appropriate container. **Containers used will be those specified in SW-846, Required Containers, Preservation Techniques, and Holding Times.** The container shall be closed, labeled and sealed as per procedure **EM-2-013.** The material (soil) collected at this depth will represent the **one foot depth sample.** Any

remaining material (soil) shall be placed in a plastic bag until all sample points have been extracted. (see paragraph 3.14)

3.10 In the same location as the one foot extraction, the EMT, wearing disposable latex gloves, will advance the stainless steel auger into the ground to a depth of 24" (two feet). All soil collected at this depth shall be deposited in a stainless steel pan and thoroughly mixed.

3.11 After the material (soil) has been thoroughly mixed, a composite of the sample will be extracted (approximately 300 grams) using the stainless steel scoop and placed in an appropriate container. **Containers used will be those specified in SW-846, Required Containers, Preservation Techniques, and Holding Times.** The container shall be closed, labeled and sealed as per procedure **EM-2-013.** The material (soil) collected at this depth will represent the **two foot depth sample.** Any remaining material (soil) shall be placed in a plastic bag until all sample points have been extracted. (see paragraph 3.14)

3.12 In the same location as the one and two foot extractions, the EMT, wearing disposable latex gloves, will advance the stainless steel auger into the ground to a depth of 36" (three feet). All soil collected at this depth shall be deposited in a stainless steel pan and thoroughly mixed.

3.13 After the material (soil) has been thoroughly mixed, a composite of the sample will be extracted (approximately 300 grams) and placed in an appropriate container. **Containers used will be those specified in SW-846, Required Containers, Preservation Techniques, and Holding Times.** The container shall be closed, labeled and sealed as per procedure **EM-2-013.** The material (soil) collected at this depth will represent the **three foot depth sample.** Any remaining material (soil) shall be placed in a plastic bag until all sample points have been extracted.

3.14 All residual material (soil) not used as a sample shall be deposited in a plastic bag and placed in a 55 gallon

drum marked solid waste. This waste shall be handled as per **SOP 20-C-601** (Packaging Low Level Radioactive Waste (LLRW) For Off-Site Disposal). The EMT shall continue to place solid waste in the 55 gallon drum provided until all sample locations applicable to a project have been completed. Until all sample analysis are completed residual material will be handled as per the above mentioned procedure. If sample analysis indicates that residual material is free of radioactive are chemical contaminants the remaining drummed residual material will be considered clean and will then be handled accordingly.

3.15 Log all completed properly contained and labeled samples onto the chain of custody form as specified in procedure **EM-2-013.**

3.16 When all sample points at a sample location have been adequately sampled, the EMT technician using Bentonite clay will fill each sample location bore hole to a level slightly above the bore excavation. This will promote runoff, prevent puddling, and also act to prevent the future entry of surface water are any contaminated material into the bore hole location.

3.17 Before moving to the next sample location all equipment shall be decontaminated as per procedure **EM-2-013.**

3.18 Environmental Monitoring QA/QC sampling requirements will be those specified as per procedure **EM-2-013.** Exceptions may be specified by cognizant project engineer as specific to his/her project.

3.19 The EMT will log identified samples onto the environmental monitoring permanent sample log.

3.20 Complete the analytical request form as specified in **EM-2-013**, assuring that all completed data is sent to cognizant project engineer, Waste Technology, and environmental technologist responsible for retaining files as per specified project.

3.21 Submit samples to the site analytical laboratory for analysis.

EM-EXM-90-006
REV - 1

ENVIRONMENTAL MEDIA SAMPLING EXTRACTION METHODOLOGY

USING THE JMC ENVIRONMENTALIST SUBSOIL PROBE

PREPARED BY Lawrence Love Jr. (TECHNOLOGIST) DATE: Sept. 28, 1990

REVIEWED BY (SR. TECHNICIAN) DATE: 10/1/90

APPROVED BY B D Vrooke DATE: 10/1/90

1.0 PURPOSE

To establish a methodology of extracting samples of the native soils at the FMPC using the JMC Environmentalist Subsoil Probe.

2.0 DEFINITIONS

2.1 EMS - Environmental Media Sampling

2.2 EMT - Environmental Monitoring Technician

2.3 ESP - Environmentalist Subsoil Probe

2.4 SAMPLE LOCATION - An area designated as a location to obtain a sample of the Native Soil and shall be an area approximately 12" by 12" square. Each sample ,location may have varying sample depths according to project requirements.

2.5 SAMPLE POINT - An area designated within a sample location where as a sample of the native soil will be extracted.

2.6 SURFACE SOIL SAMPLE (point #1) - Shall be that amount of material collected from 0" to 6" depth of the native soil at any sample location. It shall be described on the sample identification label as depth 0.

2.7 ONE FOOT DEPTH SOIL SAMPLE (point #2) - Shall be that amount of material collected from an area one inch contiguous to the surface soil sample extraction at a

sample location and will consist of material (soil) collected at 0" to 12" depth. It shall be described on the sample identification label as depth 1.

2.8 TWO FOOT DEPTH SOIL SAMPLE (point #3) - Shall be that amount of material collected from 12" to 24" in the same location as the one foot soil sample extraction. It shall be described on the sample identification label as depth 2.

2.9 THREE FOOT DEPTH SOIL SAMPLE (point #4) - Shall be that amount of material collected from 24" to 36" in the same location as the one and two foot soil sample extractions. It shall be described on the sample identification label as depth 3.

3.0 METHODOLOGY

3.1 In accordance with site policy and procedure FMPC-720 the EMT Senior Technician and cognizant project engineer shall locate and perform a walkdown and visual inspection of the area are equipment to be sampled.

3.2 The EMT Technologist and or Senior Technician will notify Industrial Hygiene, Safety, and Radiological Safety so that appropriate surveys may be performed involving area to be sampled.

3.3 Prior to sampling the EMT Senior Technician and field sampling team will perform a walkdown and visual inspection of the area are equipment to be sampled.

3.4 Before any sample extraction is performed the EMT technician shall prepare the area to be sampled in accordance with procedure **EM-2-013.**

3.5 When the sample location(s) have been identified as per procedure **EM-2-013.** The EMT technician wearing disposable latex gloves and using a pair of grass shears shall clear the sample location of all grass to expose the soil surface.

3.6 After the sample location has been cleared of existing grass. The EMT wearing personal protective equipment as

outlined in procedure **EM-2-013**, and using a stainless steel scoop, shall obtain enough soil (0" to 6") to compose a surface soil sample. The surface soil sample will be contained, labeled, and sealed in accordance with procedure **EM-2-013**. Sample volume will be specified in the project sampling plan.

3.7 After the surface sample has been extracted locate an area approximately 1" contiguous with the surface sample extraction.

3.8 Lay the ESP on clean plastic and insert a liner (36" long and 15/16" diameter) into the top of the sampling tube.

3.9 Take both sections of the drive hammer assembly (guide rod and drop hammer, see diagram attachment 1 ESP) and place on the clean plastic beside the ESP.

3.10 Insert the aluminum section of the guide rod into the top of the sampling tube.

3.11 At the sampling location tilt the ESP on a 45 degree angle and insert the drop hammer onto the guide rod.

3.12 Tip the ESP and the drop hammer assembly as a single unit into a vertical position.

3.13 Place the flipper into the driving position. **(FAILURE TO DO SO MAY RESULT IN DAMAGE TO BOTH THE SAMPLING TUBE AND THE FOOT PEDAL ASSEMBLY).**

3.14 Grip the hammer assembly with both hands. Be sure to keep your hands positioned on the hammer above the ESP to avoid getting them pinched between the hammer assembly and top of the probe. Raise the hammer approximately 12 to 18 inches above its resting position on the guide rod assembly section. Drive the hammer until it rests against the top of the sampling tube. You should see or feel the sampling tube move with each blow, if not discontinue pounding, you may have encountered a rock or some obstruction that could damage the tip of the sampling tube. In case an obstruction is encountered

you will need to start over with a new hole. Repeat 3.8 thru 3.14.

3.15 Assuming you meet no obstacles, continue driving the sampling tube into the ground until the rubber bumper on the underside of the stop ring around the hammer meets the top of the ESP body.

3.16 Depress the footpedal and swing the flipper into the up position. The jack will not work with the flipper in the driving mode (flipper down).

3.17 Lift the black plastic handle and push the jack lever away from the body of the ESP.

3.18 To extract the sampling tube from the ground, put one foot on the jack lever and the other on the ground. Depress the jack lever until you see the bottom of the drop hammer assembly.

3.19 When the bottom of the drop hammer assembly can be seen, remove the hammer assembly. **(Avoid pinching your fingers between the threaded collar and hammer by grasping the threaded collar with one hand and the hammer with the other).** Continue jacking until the sampling tube is out of the ground.

3.20 Lay the ESP horizontally onto the clean plastic sheeting provided.

3.21 Insert the dowel rod into the cutting end of the sampling tube and push out the soil core and liner. After the liner and core have been removed from the sample tube, place poly vinyl caps on both ends.

3.22 Using a nalgene marker, inscribe the date, project name, and sample location on the exterior surface of the liner. **(Always indicate which end is the top and bottom).**

3.23 A minimum of two cores shall be obtained at each location. **(more cores may be needed depending upon sample volume requirements for requested analytical parameters).**

3.24 Repeat 3.8 thru 3.23 until all sampling locations have been completed.

3.25 After all samples have been extracted remove all liners and cores into the sample prep area.

3.26 Using a nalgene marker and measuring device, divide and mark the liner and core into appropriate sections as follows: (1) 0" to 12" from top of liner and core shall represent a one foot depth sample, (two) 12" to 24" from top of liner and core shall represent the two foot depth sample, and (3) 24" to 36" from top of liner and core shall represent the three foot depth sample.

3.27 Assign a permanent Environmental Monitoring Number to those sections of the core to be submitted. Label and seal in accordance with procedure **EM-2-013.**

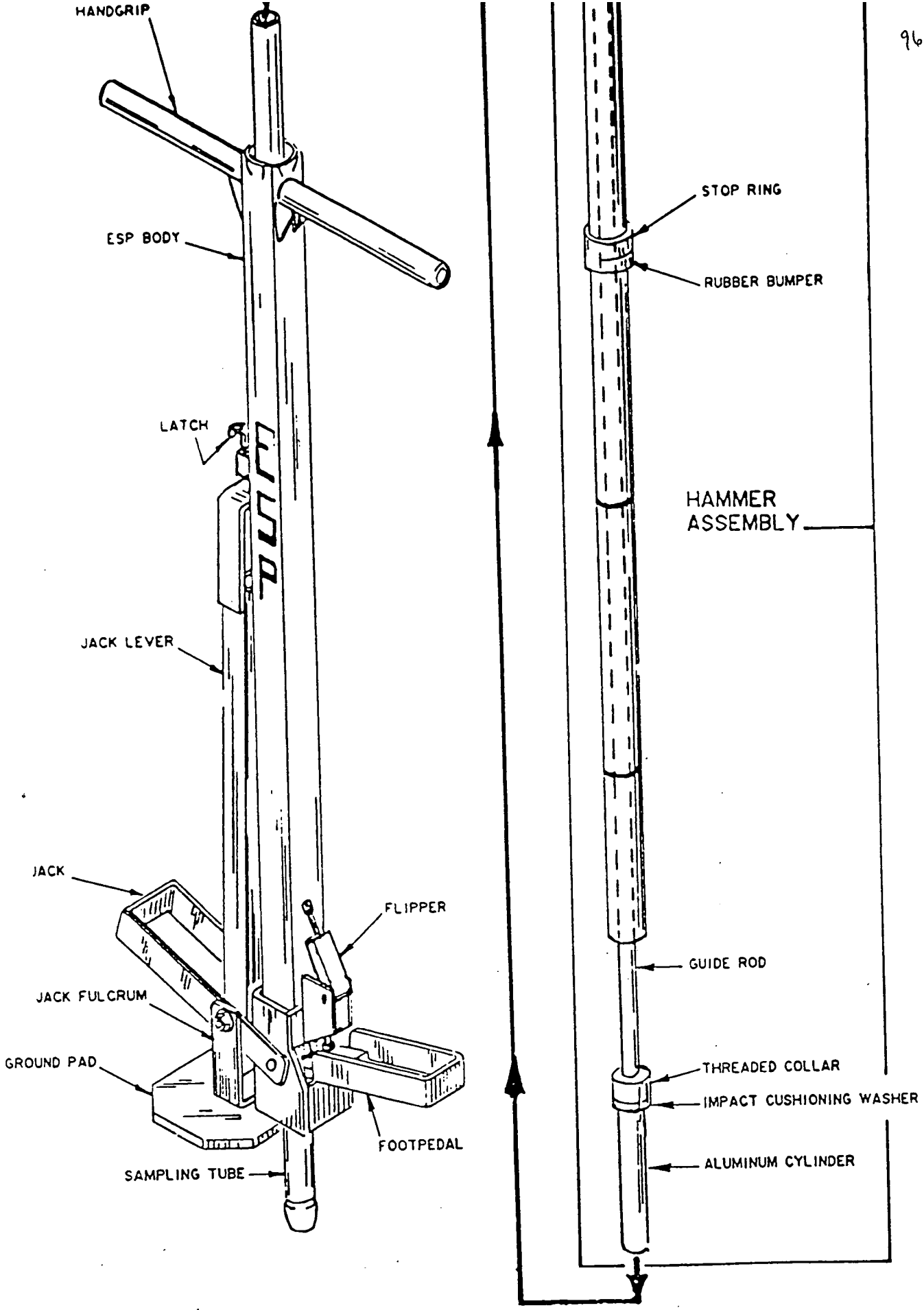
3.28 Using a nalgene marker, mark and cap the remainder of the core sample not to be submitted.

3.29 Log all collected samples as identified onto the environmental monitoring permanent sample log.

3.30 Complete analytical request/chain of custody form as specified in procedure **EM-2-013**, assuring that all completed data is sent to cognizant project engineer, Waste Technology, and environmental technologist responsible for retaining files as per specified project.

3.31 Submit samples to site analytical for analysis.

3.32 Assign a permanent Environmental Monitoring number to remaining samples and archive. Archived samples will not be submitted unless notified by cognizant project engineer.



ATTACHMENT 1

962

ENVIRONEMTAL CHARACTERIZATION & SURVEILLANCE

TECHNICIAN REVIEW AND SIGN OFF SHEET

EM-EXM-90-006

1. [illegible]
2. Daniel A. Back
3. Doug Henderson
4. [illegible]
5. Andy Russell
6. John Brace
7.
8.
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ATTACHMENT III

HEALTH AND SAFETY PLAN

FOR THE

WASTE PIT AREA STORM WATER RUN-OFF CONTROL

REMOVAL ACTION
FEED MATERIALS PRODUCTION CENTER

December, 1990

APPROVAL:

I.W. Diggs 12/11/90

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Figure 1 Location of Proposed Work in Waste Pit Area

Figure 2 FMPC Rally Points

Figure 3 Routes to FMPC Medical Facility

1.0 TASKS TO BE PERFORMED

This removal action will include planned separation of drainage areas within the waste pit area (see Drawing C-3). Contaminated storm water from a perimeter area around the six waste pits and four concrete silos will be collected in the existing Clearwell and in a new collection sump and pumping station that will be located south of the Clearwell. Flow control devices will be installed in two upstream drainage channels located in the waste pit storage area to restrict peak flows to the new pumping station. The new system will pump the collected storm water run-off to the biodenitrification surge lagoon (BSL), where suspended solids would be allowed to settle prior to treatment through the biodenitrification towers and effluent water treatment system, whereupon, the water will then be discharged through the FMPC National Pollutant Discharge Elimination System (NPDES) monitoring discharge outfall to the Great Miami River.

Listed below are several of the major construction activities involved in this removal action and a checklist of standard actions that may occur for each activity. These standard actions are indicated as to whether or not they are expected to occur.

1.1 Installation of drainage ditches, dikes, and culverts will:

yes	Disturb Surface Soil	yes	Sample Surface Water
yes	Disturb Subsurface Soil	no	Sample Lagoons
yes	Use Heavy Equipment	no	Use Boat
yes	Enter Confined Space	yes	Involve Radioactivity
no	Disturb Containerized Matter	yes	Involve Trenches

1.2 Installation of the flow control and overflow structures will:

yes	Disturb Surface Soil	yes	Sample Surface Water
yes	Disturb Subsurface Soil	no	Sample Lagoons
yes	Use Heavy Equipment	no	Use Boat
no	Enter Confined Space	yes	Involve Radioactivity
no	Disturb Containerized Matter	no	Involve Trenches

1.3 Installation of the new collection sump and associated equipment will:

yes	Disturb Surface Soil	yes	Sample Surface Water
yes	Disturb Subsurface Soil	no	Sample Lagoons
yes	Use Heavy Equipment	no	Use Boat
yes	Enter Confined Space	yes	Involve Radioactivity
no	Disturb Containerized Matter	yes	Involve Trenches

1.4 Installation of the underground force main from the pump station to the BSL will:

yes	Disturb Surface Soil	no	Sample Surface Water
yes	Disturb Subsurface Soil	no	Sample Lagoons
yes	Use Heavy Equipment	no	Use Boat
yes	Enter Confined Space	yes	Involve Radioactivity
no	Disturb Containerized Matter	yes	Involve Trenches

2.0 SITE HISTORY

Prior to February 1987, solid and slurried wastes from the FMPC processes were disposed of in the on-site waste storage area. This area, which is located west of the production facilities, includes six low-level radioactive waste storage pits, a burn pit, a Clearwell, two earthen-bermed concrete silos containing K-65 residues (i.e., high specific activity and low-level radium-bearing residues resulting from the pitchblende refining process), a concrete silo containing metal oxides, two lime sludge ponds, and a sanitary landfill.

Surface water run-off from portions of the waste pit area and other affected areas flows from the East side of the FMPC west to Paddys Run, a tributary of the Great Miami River. Paddys Run originates north of the FMPC and flows south-southeast along the western edge of the site and, for a part of the year, is a dry streambed with occasional rainfall-induced flows.

Leachate from these same areas can potentially migrate vertically to the regionally important Great Miami Aquifer which underlies the site. This aquifer serves as a principal source of domestic, municipal, and industrial water throughout the region. A portion of the flow in Paddys Run is also known to enter this aquifer downstream from the waste pit area as a result of leakage through the stream bottom.

The tasks associated with this removal will be performed in the waste storage area. The waste storage area is located within the FMPC property boundary. The six low-level radioactive waste storage pits, the burn pit, the two earthen-bermed silos, the concrete silo containing metal oxides, the lime sludge ponds, and the sanitary landfill are currently out of service.

3.0 TASK SPECIFIC HAZARD ASSESSMENT

A preliminary review of the area and soil and groundwater analysis surveys of the waste storage area by personnel performing the RI/FS field investigations and work plan development indicated the potential hazards identified below.

Prior to the initiation of the removal field activities, a reassessment of the conditions will be conducted to ensure that a safe working environment can be provided. All newly identified hazards will be addressed with the Industrial, Radiological, Safety and Training (IRS&T) representative(s) to determine the degree of hazard and if any additional requirements to this safety plan are needed.

3.1 Health Hazards

Heat Stress
Noise

3.2 Safety Hazards

Confined Space
Cave In
Overhead Hazards
Underground Utilities
Heavy Equipment Operation
Falling Hazards

3.3 Radiological Hazards

The primary routes of entry of the potentially significant site contaminants are inhalation and ingestion. Direct contact may result in absorption if the compounds are water soluble. Radon gas presents an inhalation hazard as do its short-lived radioactive daughters.

Contaminant	Derived Air Concentration (DAC)	Action Level
Thorium-230	3E-12 uCi/ml	0.7E-12 uCi/ml
Ra-226	3E-10 uCi/ml	0.7E-10 uCi/ml
Uranium-238	2E-11 uCi/ml	0.5E-11 uCi/ml
Radon Daughters (Po-218, Pb-214, Bi-214, Po-214)	0.3 Working Level (WL)	0.07 (WL)

Rn-222	60 pci/l (50% equilibrium)	15 pCi/l
Uranium-235 (trace levels of actinium series)	2E-11 uCi/ml	0.5E-11 uCi/ml
Uranium-234	2E-11 uCi/ml	0.5E-11 uCi/ml

3.4 Chemical Hazards	Permissible Exposure Limit (PEL)	Action Level
Lead	50 ug/m³	30 ug/m³
Organics (unknown)	Default Value	See Section 4.3 (HNu)
Calcium Hydroxide*		

* This is the alkali present in readi-mix concrete and can cause alkali burns on prolonged contact. No airborne PEL or action level is listed since it is delivered wet.

4.0 MONITORING

4.1 Goals

No significant generation of air activity is expected from the identified tasks. Radioactive contamination monitoring will be performed when soil media is disturbed to ensure that the spread of contamination is minimized.

Air monitoring will be performed to assure that contaminant concentrations in the breathing zone do not exceed the concentrations specified by established exposure levels. The action levels include an additional safety factor of four to account for potential inaccuracies associated with the use of field measurements. If identities of airborne organic concentrations are unknown, default values will be used.

WMCO policy requires engineering controls or the use of PPE to limit onsite exposures to the action limit values. It is advisable to keep exposures to chemicals as low as possible since there is insufficient data to predict the combined effects of most chemical mixtures.

4.2 Monitoring Equipment

4.2.1 Health Hazards

Heat Stress - Heat stress is not anticipated to be a problem except on extremely humid days or when area contamination levels require use of respirators and/or anti-contamination clothing. Requirements for control and monitoring of heat stress shall be followed in these situations, or whenever the ambient temperature is above 80°F.

Noise - Employees exposed to an average noise level of 85 dBa or above over an 8-hour day shall be included in a hearing conservation program. Any time noise levels exceed 90 dBa, hearing protection shall be worn, regardless of how long the exposure lasts. The monitoring of these noise levels will be performed by WMCO IRS&T representative as required.

4.2.2 Safety Hazards

Confined Space - Confined spaces are generally defined as a potential oxygen deficiency and or limited spacial constraints. Entry into a confined space is controlled as defined in WMCO Procedure #IH&S-IH-05-Control of Entering and/or Working in a Confined Space.

Cave In - Cave In is a potential during any excavation. Therefore, caution must be exercised. Any excavation of greater than 5 feet in depth will invoke the OSHA Requirement 29 CFR 1926 Subpart P.

Overhead Hazards - The only overhead hazards that exist in the work area for this project are light poles and associated wiring to them. Caution must be exercised any time work is being performed near these potential hazards.

Underground Utilities - Underground utilities such as electricity, natural gas, storm sewers, and telephone lines will be identified and marked by the WMCO utility engineer(s) prior to any excavation activity. Again, caution must be exercised any time work is being performed near these potential hazards.

Heavy Equipment Operation - All heavy equipment operations will be performed within the exclusion zone, therefore, standard

construction worker safety practices will be adequate to protect the fellow workers, and all other persons will be excluded.

Falling Hazards - The falling hazards described here refer to the potential for workers to fall into open excavations. These open excavations will be posted as a potential falling hazard.

4.2.3 Radiological Hazards

4.2.3.1 Airborne Radioactivity

Air samples will be taken in the general vicinity of the work areas.

Local or breathing zone samples will be taken in the vicinity of all excavation activities.

Air sampling will also be performed for long-lived alpha radioactivity if surface contamination levels exceed 500 cpm with a beta-gamma G-M probe. Minimum detectable activity shall be at least 2×10^{-12} uCi/ml.

Instrument: Air Sampler (High volume)

Hazard Measured:	Collects airborne particulate for laboratory measurement.
Application:	Measure of air activity when surface contamination is present.
Detection Method:	Not applicable, analysis performed in laboratory.
General Care:	Daily inspection
Calibration:	Six (6) months.

Radon monitoring will be performed in the vicinity of the work area. On-line monitors will be utilized by the WMCO IRS&T personnel as deemed appropriate, but as a minimum at initial mobilization and once per week thereafter.

Instrument: On-Line Continuous Radon Gas Monitor

Hazard Measured:	Rn-222 and/or radon daughters
Application:	Measures radon levels in ambient air
Detection Method:	Continuous metered flow of ambient air through the instrument. Analysis operation is; flow through a Lucas Cell, or Ion Chamber, or Passive Scintillation Photo Multiplier Tube.
General Care:	Prior to each use, inspect, clean, and maintain the instrument and accessories as required.
Calibration:	Factory calibration every six (6) months.

4.2.3.2 Radioactive Surface Contamination

Radioactive surface contamination will be identified by WMCO IRS&T personnel as they perform the survey for the required radiation work permits, and to ensure the 2 mR/hr action limit is not exceeded. Radioactive surface contamination will be monitored whenever soil is disturbed by excavation and/or backfill activities.

Instrument: Alpha and Beta-Gamma Contamination Monitor

Hazard Measured:	Alpha, Beta and Gamma radiation.
Application:	Monitors surfaces for radioactive contamination.
Detection Method:	Alpha Scintillator and Geiger-Mueller tube.

General Care: Daily source and battery check.

Calibration: Six (6) months.

4.2.4 Chemical Hazards

Initial sampling has been performed as indicated on the sample boring plan (Figure 1) to characterize chemical hazards in the removal action work area. Monitoring and sampling activities for chemicals will be conducted while site activity is ongoing to assure that established action levels are not exceeded. Sampling for chemicals will be conducted as determined to be necessary by the IRS&T representative.

Instrument: Photoionization Detector (HNu)

Hazard Measured: Many organic gases and vapors.

Application: Detects total concentration of many organic gases and vapors.

Detection Method: Ionizes molecules using UV radiation and produces a current that is proportional to the number of ions.

General Care: Recharge or replace battery. Regularly clean lamp window. Regularly clean and maintain the instrument and accessories.

Calibration: Daily. Factory calibration once/year.

4.3 Field Action Limits

INSTRUMENT	INTERVAL[1]	LIMIT	ACTION
Exposure Rate Meter	Pre-Job	>2mR/hr	H.P. Review
Alpha Probe[2]	Pre-Job & Intermitent	500 cpm[3] >25,000 cpm	APR[4] Withdraw
Beta/Gamma Probe[2]	Pre-Job & Intermitent	5,000 cpm[3] >250,000 cpm	APR[4] Withdraw
HNU Meter	Intermitent	Detection to 10 ppm[5] 10-25 ppm >25 ppm	APR[4] SAR[6] Withdraw
Radon and WL Monitor	Intermitent & Continuous	>15 pCi/L or >0.075 to 1.65 WL >1.66 to 66 WL >66.0 WL	APR[4] SAR[6] Withdraw
High Volume Air Sampler for Radionuclides	Continuous	NA-No real time results	Action levels as stated in Section 3.3

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[1] "Intermittent" is as deemed necessary by the Safety and Health Officer, or at a minimum of once a day.

[2] "Frisking" for alpha contamination and beta/gamma contamination using handheld alpha scintillator and Geiger Mueller detectors respectively.

[3] Above background.

[4] Full-face air purifying respirators with HEPA or organic vapor, acid gas, fume cartridges (H.P. Review). Disposable protective clothing, such as Saranax coveralls and a step-off decontamination will also be required at any time APR are used.

[5] 1ppm above background.

[6] Supplied Air Respirator.

Airborne Lead (Breathing zone Sampler)	Continuous	NA-No realtime Results	Action levels as stated in Section 3.4

5.0 PERSONAL PROTECTIVE EQUIPMENT

All employees in the task areas will wear the following personal protective equipment while performing the required tasks.

5.1 Installation of drainage ditches, dikes, and culverts

ITEM	NEED	JUSTIFICATION
Air Purifying Respirator	No (yes)	Required if action levels are exceeded or as specified by IRS&T rep
Cartridges: HEPA/Organic Vapor	No (yes)	Required if action level are exceeded or as specified by IRS&T rep
Hard Hat	Yes	Minimum Requirement
Safety Cover Goggles	Yes	During concrete breaking/cutting
Hearing Protection	Yes	During concrete breaking/cutting or any other activities exceeding 90 dBa as identified by IRS&T rep
Inner Gloves	No (Yes)	As needed to prevent contact with liquids

Rubber Boots	Yes	As needed to prevent contact with liquids
Knee Pads	Yes	During concrete troweling to prevent alkali burns
Leather-Palm Gloves	Yes	As needed for physical protection of hands
Neoprene/Nitrile Gloves	Yes	As needed to prevent contact with liquids
Coveralls	No	
Plain Tyvek	No	
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
Supplied Air Respirator (SAR)	No (Yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	No	
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	

5.2 Installation of the flow control and Overflow Structures

ITEM	NEED	JUSTIFICATION
Air Purifying Respirator	No (yes)	Required if action levels are exceeded or as specified by IRS&T representative

5.2 Installation of the flow control and overflow structures (Cont'd)

ITEM	NEED	JUSTIFICATION
Cartridges: HEPA/Organic	No (yes)	Required if action vapor levels are exceeded or as specified by IRS&T representative
Hard Hat	Yes	Minimum Requirement
Hearing Protection	Yes	During concrete breaking/cutting or any other activities exceeding 90 dBa as identified by IRS&T rep
Inner Gloves	No	
Rubber Boots	Yes	As needed to prevent contact with liquids
Knee Pads	Yes	During concrete troweling to prevent alkali burns
Leather-Palm Gloves	Yes	As needed for physical protection of hands
Neoprene/Nitrile Gloves	Yes	As needed to prevent contact with liquids
Coveralls	No	
Plain Tyvek	No	
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
SAR	No(Yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	Yes	During hydrostatic testing and as needed

5.2 Installation of the flow control and overflow structures (Cont'd)

ITEM	NEED	JUSTIFICATION
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	
Face Shield	No	

5.3 Installation of the new collection sump, submersible pumps, and associated equipment

ITEM	NEED	JUSTIFICATION
Air Purifying Respirator	No (yes)	Required if action levels are exceeded or as specified by IRS&T rep
Cartridges: HEPA/Organic	No (yes)	Required if action vapor levels are exceeded or as specified by IRS&T rep
Hard Hat	Yes	Minimum Requirement
Hearing Protection	Yes	During concrete breaking/cutting or any other activities exceeding 90 dBa as identified by IRS&T rep
Inner Gloves	No	
Rubber Boots	Yes	As needed to prevent contact with liquids
Knee Pads	Yes	During concrete troweling to prevent alkali burns
Leather-Palm Gloves	Yes	As needed for physical protection of hands

5.3 Installation of the new collection sump, submersible pumps, and associated equipment (Cont'd)

ITEM	NEED	JUSTIFICATION
Neoprene/Nitrile Gloves	Yes	As needed to prevent contact with liquids
Coveralls	No	
Plain Tyvek	No	
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
SAR	No(Yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	Yes	During hydrostatic testing and as needed
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	
Shoe Covers	No	
Face Shield	No	

5.4 Installation of the force main from the pump station to the BSL

ITEM	NEED	JUSTIFICATION
Air Purifying Respirator	No (yes)	Required if action levels are exceeded or as specified by IRS&T rep
Cartridges: HEPA	No (yes)	Required if action levels are exceeded or as specified by IRS&T rep
Hard Hat	Yes	Minimum Requirement

5.4 Installation of the force main from the pump station to the BSL (con't)

ITEM	NEED	JUSTIFICATION
Hearing Protection	Yes	During concrete breaking/cutting or any other activities exceeding 90 dba as identified by IRS&T rep
Inner Gloves	No	
Rubber Boots	Yes	As needed to prevent contact with liquids
Knee Pads	Yes	During concrete troweling to prevent alkali burns
Leather-Palm Gloves	Yes	As needed for physical protection of hands
Neoprene/Nitrile Gloves	Yes	As needed to prevent contact with liquids
Coveralls	No	
Plain Tyvek	No	
Process Coveralls	Yes	Minimum Requirement
PVC Gloves	No	
SAR	No(Yes)	Required if action levels are exceeded
Safety Glasses	Yes	Minimum Requirement
Safety Goggles	Yes	During hydrostatic testing and as needed
Safety Shoes	Yes	Minimum Requirement
Saranex Tyvek	No	

5.4 Installation of the force main from the pump station to the BSL (con't)

ITEM	NEED	JUSTIFICATION
Shoe Covers	No	
Face Shield	No	

6.0 SITE CONTROL

6.1 Access

The work associated with this removal action will be within the FMPC controlled area. In addition, the work area related to this removal action will be posted as "RWP Required for Entry". This will establish the Exclusion Zone per 29 CFR 1910.120.

The Exclusion Zone is the zone of high potential hazard due to physical or chemical dangers. Access to the Exclusion Zone will be restricted by Radiological Safety to trained and certified employees, as regulated by 29 CFR 1910.120, who are required to enter in order to perform their job functions. There will be different Exclusion Zones for the various tasks. The Exclusion Zone will be marked with barrier tape or other easily recognizable devices. The zone may be expanded if airborne hazards are detected. All areas requiring the use of respiratory protection are included in the exclusion zone. Entrance shall be limited to one area and controlled by the supervisor-in-charge.

IRS&T representatives will establish a Contamination Reduction Zone, consisting of step-off pads, at the exit to the Exclusion Zone. This zone will be used for removal of disposable personal protective equipment and for cleaning of contaminated equipment when required.

For this removal action, the Security fence will be relocated along with the existing perimeter gravel road in the area of the new collection sump. Therefore the new area will have to be surveyed to verify that no dosimeters will be required.

6.1.1 Radiological Postings

Radiological areas will be posted in accordance with DOE Order 5480.11. The following is a brief summary of posting requirements based on uranium:

Regulated Area:	> 1000 dpm/100 cm^2 removable > 5000 dpm/100 cm^2 fixed and removable
Contaminated Area:	> 10,000 dpm/100 cm^2 removable > 50,000 dpm/100 cm^2 fixed and removable
Airborne Radioactivity Area:	> 2 X 10^{-12} uCi/ml
Respirator Area:	> 5 X 10^{-12} uCi/ml

In addition, special postings may be added for access to areas: "RWP Required for Entry" or "Contact HP for Entry".

Figure 1 (Sample Boring Plan) shows the locations of sample locations which have been completed in the work area for purposes of radiological and contaminant characterization. Data from the sample analysis have been utilized to establish exclusion zone and personnel protection requirements for work being performed in these respective areas.

6.2 Bioassay Samples

FMPC personnel and subcontractors involved in this project are required to participate in a routine periodic urine assay program. Any suspected exposure to hazardous substances shall be reported and may require additional sampling as identified by the Director, Medical Services. Personnel are also required to wear a TLD at all times on the job site.

6.3 Medical Monitoring

In accordance with 29 CFR 1910.120 OSHA requirements, all WMCO and WMCO subcontractor personnel are required to participate in a medical monitoring program which includes:

- A baseline medical examination
- Annual medical examination
- Medical examinations may be required after potential exposures.
- WMCO respirator clearance for users

Additional requirements for personnel surveillance and monitoring for lead exposure as outlined in 29 CFR1901.1025 will be implemented for this action. Personnel involved in this project shall be identified by name and badge number. Prior to start of work, each shall be individually subject to a medical surveillance approval to work by the Director, Medical Services.

6.4 Safety Meetings

A safety meeting, which must be documented, shall be conducted for all personnel assigned to work on the construction activity before initial work mobilization and prior to the start of each day's work. These safety meetings will cover the following applicable subjects:

[] work operations
[] personnel protective equipment
[] all monitoring data
[] hazard communications
[] monitoring tests and results
[] decontamination
[] task organization
[] physical stress
[] emergency procedures
[] communications
[] general safety
[] housekeeping
[] spill containment

Information pertaining to the above referenced subjects can be obtained from the applicable FMPC procedures for this removal action. These procedures include, but are not limited, to the following:

{} FMPC-503 - FMPC Spill Reporting and Cleanup.
{} FMPC-704 - Minor Event Reporting System.
{} FMPC-719 - P.R.O.P.E.R. Lock and Tag Procedure
{} FMPC-2084 - FMPC Radiation Control Manual
{} FMPC-2152 - FMPC Respirator Protection Manual

7.0 Training Requirements

All FMPC and subcontractor personnel assigned to the tasks will, as a minimum, meet the following training requirements including:

- o Documented safety meeting to review this health & safety plan including site specific hazards and procedures
- o WMCO radiation safety training
- o WMCO respirator medical review, respiratory training, and quantitative fit test or equivalent approved by WMCO Industrial Hygiene
- o 40-hour OSHA training
- o 8-hour annual refresher training
- o 8-hour supervisory training (for supervisors)
- o 24-hour supervised field experience
- o Review of MSDS for all hazardous chemicals used on this project.

8.0 EXPOSURE SYMPTOMS

Exposure to low levels of radioactivity does not produce acute exposure symptoms. However, chronic exposure may cause delayed effects such as cancer. Such exposures will be kept As Low As Reasonably Achievable (ALARA). Acute and Chronic exposures to lead may cause noticeable symptoms as identified below. See Section 12 for contingency plans.

Exposure symptoms for the materials at this site are on file and are described in the appropriate MSDS's and Guidelines which will be made available at the work area. Noticeable symptoms and first aid for acute exposure to these materials are summarized below:

- Soluble Uranium and other Radionuclides

Exposure Routes:	Respiratory tract and broken skin
Acute Symptoms:	There are no typically identified acute symptoms, however respiratory irritation and kidney distress may be observed at high exposure.
First Aid:	Inhalation - Remove individual to fresh air. If difficulty breathing is because of exposure to soluble compounds start bioassay procedures (urinalysis) to quantify dose. Broken Skin - Remove contaminated clothing. Flush with water for 15 minutes. Check cleaned skin with frisker to ensure complete removal.

- Lead, Inorganic

Exposure Routes:	Respiratory tract
Acute symptoms:	Inhalation of large amounts over short time frame may cause headache, convulsions, coma, delirium, or death. Early effects of lead poisoning are difficult to detect from the common cold but do include fatigue, headache, and nausea.
First Aid:	Remove individual to fresh air and transport to medical facility for further evaluation and treatment.

9.0 SITE ENTRY PROCEDURES

During the implementation of activities described earlier in this plan (Section 1.0) the following shall be observed:

- o Identify exclusion zone, contamination reduction zone, and break area.
- o Perform daily safety meeting to familiarize team with site specific hazards.
- o Discuss alternate communications signals (if applicable).
- o Perform respirator check out and fit check prior to use.
- o Use the buddy system. Teams of at least two individuals will be used for all activities within the exclusion zone.

10.0 DECONTAMINATION

Equipment for decontamination of radiological or chemical hazards shall be kept available in the area surrounding the Exclusion Zone if such is determined necessary by the supervisor or by either Radiation Safety or Industrial Hygiene prior to the initiation of the activity.

Decontamination reduces contaminant concentrations to acceptable levels, but does not generally remove it totally. Try to avoid contamination where possible by making minimum contact with the contaminant.

The following measures will be employed to accomplish necessary decontamination on exit from the exclusion zone:

Personnel: Dry removal of disposable protective equipment; wash hands, face and any other exposed skin; detergent and water should be used to wash skin surfaces which have contacted potentially contaminated wastes.

The effectiveness of decontamination must be confirmed by frisking or the use of hand and foot monitors.

Monitoring Equipment: Any exposed areas of the monitoring equipment surface will be wiped with a damp paper towel/cloth to remove contamination. Wiping with cloth dampened with detergent solution may be necessary to remove greasy materials.

Heavy Equipment: Heavy equipment generally requires decontamination at the WMCO operated D&D facility (Building 69). Frisking and/or wipe tests will be performed to confirm the effectiveness of decontamination.

11.0 WASTES

Wastes include, but are not limited to:

- Disposable PPE
- Excess materials such as soil or concrete

All potentially contaminated waste materials resulting from site activities will be collected and placed in drums or other containers. Disposable protective clothing will be placed in plastic bags and disposed of as compactible, potentially contaminated waste.

Drums or containers shall meet DOE 49 CFR Parts 171-178, EPA, 40 CFR Parts 264-265 and 300, and OSHA requirements. Hazard warning label shall be immediately applied to all drums as specified by WMCO management/supervisors and Solid Waste Compliance.

12.0 CONTINGENCY PLANS

12.1 Incidents, Injuries, or Illness

For the possible intake of radiological substances, special, end of shift and follow-up urine samples will be submitted pursuant to instructions in WMCO Standard Operating Procedure (SOP) 11-C-245.

Incidents of injuries or illness involving potential intake of lead, organic materials or other suspect substances which may be found at the work site shall be reported to the supervisor-in-charge or the emergency

response team. Notification of response personnel will be done by telephone or way radio where phones are not available. The affected individual will be transported to the site medical facility for further evaluation and treatment if required by the medical section. An Incident Investigation Report will be completed and submitted through the supervisor by the involved employee.

12.2 Pre-Emergency Planning

During the training and pre-work safety meetings, all employees involved in this task shall be trained and reminded of the provisions of the plant emergency procedure, alarm signals and communications, evacuation routes, emergency reporting, and the importance of maintaining continual communications with FMPC emergency preparedness personnel via 2-way radio or cellular phone.

12.3 Lines of Authority

The construction supervisor in charge or his designated alternate has the primary responsibility for the prevention of and the initial response to emergency conditions. The supervisor in charge will direct emergency response actions at the work site until relieved by the WMCO Assistant Emergency Duty Officer - (AEDO), or the Emergency Response Team. In the event an emergency does occur, the individual involved in or observing the condition shall immediately notify the following in order of availability: the supervisor in charge; the communications center; the AEDO; the Health and Safety Officer; the Project Engineer/Operable Unit Manager. The AEDO is responsible for ensuring that corrective actions have been implemented, the appropriate personnel notified and reports completed as required. Personnel observing unsafe conditions at the work site shall report same to the supervisor in charge or the Health and Safety Officer who will stop work activity in the affected area until the hazardous condition can be remedied.

12.4 Evacuation

In the event an evacuation of the removal site is required, the supervisor-in-charge will be responsible for notifying all personnel involved. Personnel performing these tasks will proceed to the rally point as designated by the supervisor-in-charge. The FMPC designated rally points within the DOE property are shown on Figure 2. When the supervisor-in-charge is informed that an all-clear condition has been achieved, personnel will be released from the rally point.

In the event of an emergency which necessitates an evacuation of the Exclusion Area, the 2-2, 2-2 alarm signal shall be sounded over the plant alarm system; a voice message will follow over the Emergency Message

System (EMS) instructing employees to go to their designated rally point. Personnel shall immediately proceed to the rally point. Personnel will follow instructions given by the rally point coordinator and participate in the accountability process. When an all-clear condition has been achieved, personnel will be released from the rally point. It is conceivable that the plant alarm system horns or EMS will not be audible in certain remote locations of the removal action work area. For this reason communications with the FMPC communications control center via 2-way radio or cellular phone will be maintained at all times by the supervisor-in-charge.

12.5 Emergency Notification

All emergencies shall be reported immediately. Emergencies can be reported by dialing telephone extension (ext.) 6511; by contacting the communications center via two-way radio; or by pulling a manual fire alarm. Any additional information pertaining to the emergency shall be reported to the responding personnel to assist in defining appropriate response to the emergency.

12.6 Fire, Explosion, or Medical Emergency

In the event of a fire, explosion or medical emergency, the communication center shall be notified immediately by manual fire alarm, two-way radio, or by calling ext. 6511. The communication center operator will activate the
emergency response team and dispatch them to the appropriate location. Non essential personnel in the immediate area should evacuate to a safe position and await instructions.

If medical attention is required, and the nature of the injury or illness is minor the affected personnel shall be taken to the FMPC Medical Facility located as shown on Figure 3. The FMPC ambulance will be called to transport individuals who have suffered major injury or illness.

12.7 Additional Information

12.7.1 Hospitals

The FMPC Medical Facility (Building 53) is the primary choice for on-site injuries. The FMPC ambulance or "Life Flight" helicopter will transport the injured to the nearest hospital if necessary. FMPC maintains an emergency response capability which includes an ambulance and Emergency Medical Technicians (EMTs).

12.7.2 Emergency Telephone Numbers

The following telephone numbers are FMPC site telephone numbers.

Ambulance:	738-6511
Hospital:	738-6511
Fire:	738-6511

Name	Number	Radio
Emergency Response	738-6511	Call Control
Industrial Hygiene	738-6207	357
Radiation Safety	738-6889	355
Fire and Safety	738-6235	303
Assistant Emergency Duty Officer (AEDO)	738-6431 or 738-6295	202
Safety and Health Officer (RUST Engineering)	738-6564	204

12.8 Emergency Equipment

The following safety equipment, locations to be identified at safety meetings, is available for employee usage:

- fire extinguisher
- eye wash
- safety shower
- telephone
- spill drums
- absorbent
- manual fire alarm
- two-way radio
- emergency SCBA units
- respirators
- clean-up materials
- local evacuation alarm

13.0 AMENDMENTS

This Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise which require reassessment of safety procedures. It is important that personnel protective measures be thoroughly assessed by the supervisor in charge and IRS&T representative prior to and during the planned task activities. Unplanned activities and/or changes in the hazard status shall require a review of and may require changes in this plan.

Changes in the anticipated hazard status or unplanned activities will be submitted as a amendment to this Health and Safety Plan.

Amendments must be approved by the plan author and IRS&T prior to implementation of the amendment.

14.0 APPROVAL AND COMPLIANCE STATEMENT

This site specific safety plan was produced for the use of FMPC employees and subcontractors. It was intended for the FMPC and specifically for personnel performing the activities described in this Health and Safety Plan.

The personnel performing these tasks must read and understand this site specific health and safety plan and agree to follow its provisions[1]. Written documentation with signatures of those personnel performing these tasks must be maintained.

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[1]Compliance with the provisions of the Health and Safety Plan may be audited through announced or unannounced site visits. Be sure that the provisions of this safety plan are implemented and document the reasons for field actions/changes when they are necessary.

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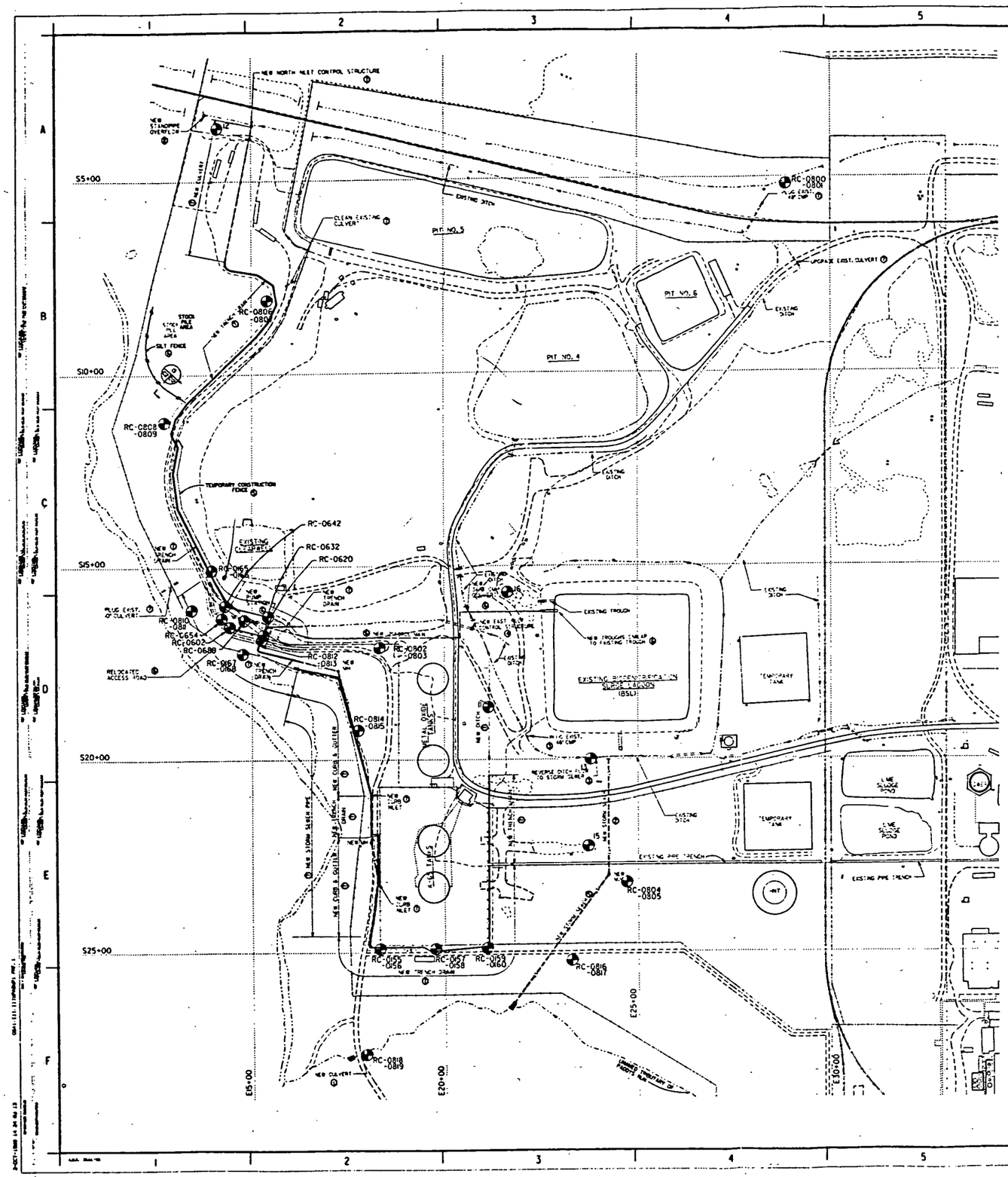


NOTES

CONSTRUCTION SEQUENCE

1. INSTALL NEW CULVERT UNDER THE EXISTING ENTRANCE ROAD AND PLACE ROCK CHANNEL PROTECTION AS INDICATED.
2. CONSTRUCT NEW STORM SEWER FROM A POINT SOUTH OF EXISTING BIOREMEDIATION LAGOON, UNDER THE EXISTING PIPE TRENCH, AND DISCHARGING INTO UNNAMED TRIBUTARY. IF PADDYS RUN, PLACE ROCK CHANNEL PROTECTION AS INDICATED.
3. PLUG EXISTING 48" R.C.P. CULVERT, LOCATED NEAR THE SOUTHWEST CORNER OF THE EXISTING BIOREMEDIATION LAGOON AND REGRADE TO REVERSE DITCH FLOW TOWARDS THE NEW STORM AREA.
4. CONSTRUCT NEW EAST WEST CONTROL STRUCTURE.*
5. ERECT TEMPORARY CONSTRUCTION FENCE, REMOVE EXISTING ROADWAY AND PROVIDE TEMPORARY ACCESS ROAD TO THE EXISTING TRAILERS LOCATED NEAR THE NORTHWEST CORNER OF THE WASTE PIT AREA.
6. ERECT SILT FENCE AROUND DOWNSTREAM END OF STOCKPILE AREA AND CONSTRUCT NEW SUMP, PUMP STATION, FORCE MAIN, CULVERT, UNDERFORCE MAIN, AND CONSTRUCT RELOCATED ROADWAY. THIS UNIT IS TO BE TOTALLY OPERATIONAL BEFORE PROCEEDING WITH ANY TRENCH CONSTRUCTION.
7. REMAINDER OF CONSTRUCTION, EXCEPT FOR NEW STANDPIPE OVERFLOW, HOLDING TRENCH DRAINS, STORM SEWER, CULVERTS AND THE NORTH WEST CONTROL STRUCTURE.*
8. CONSTRUCT NEW STANDPIPE OVERFLOW.

*PROVISIONS SHALL BE MADE TO HAVE A QUALIFIED GEOTECHNICAL ENGINEER INSPECT ALL FOOTING EXCAVATIONS TO ASCERTAIN THE SUITABILITY OF THE FOUNDATION. IF DEVIATION FROM THE DESIGN IS NECESSARY BASED ON THE GEOTECHNICAL ENGINEER SHALL CONDUCT THE NECESSARY ADDITIONAL EXPLORATION, TESTING PROGRAM, AND FOUNDATION ANALYSIS TO DETERMINE THE MAXIMUM LONG TERM SETTLEMENT AND MAXIMUM DIFFERENTIAL SETTLEMENT FOR THE CONCRETE SUMP AND THE FLOW CONTROL STRUCTURES. BASED ON THE GEOTECHNICAL REPORT, THE A/E ENGINEER WILL CONFIRM THE FOUNDATION DESIGN.

LEGEND

	NEW	EXISTING
DITCHES		
CULVERTS		
STORM SEWER		
TRENCH DRAINS		
DRAINAGE AREA LIMITS		
SILT FENCE		
CONSTRUCTION FENCE		
SAMPLE BORINGS	RC-0800 -0801	

FIGURE 1

UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

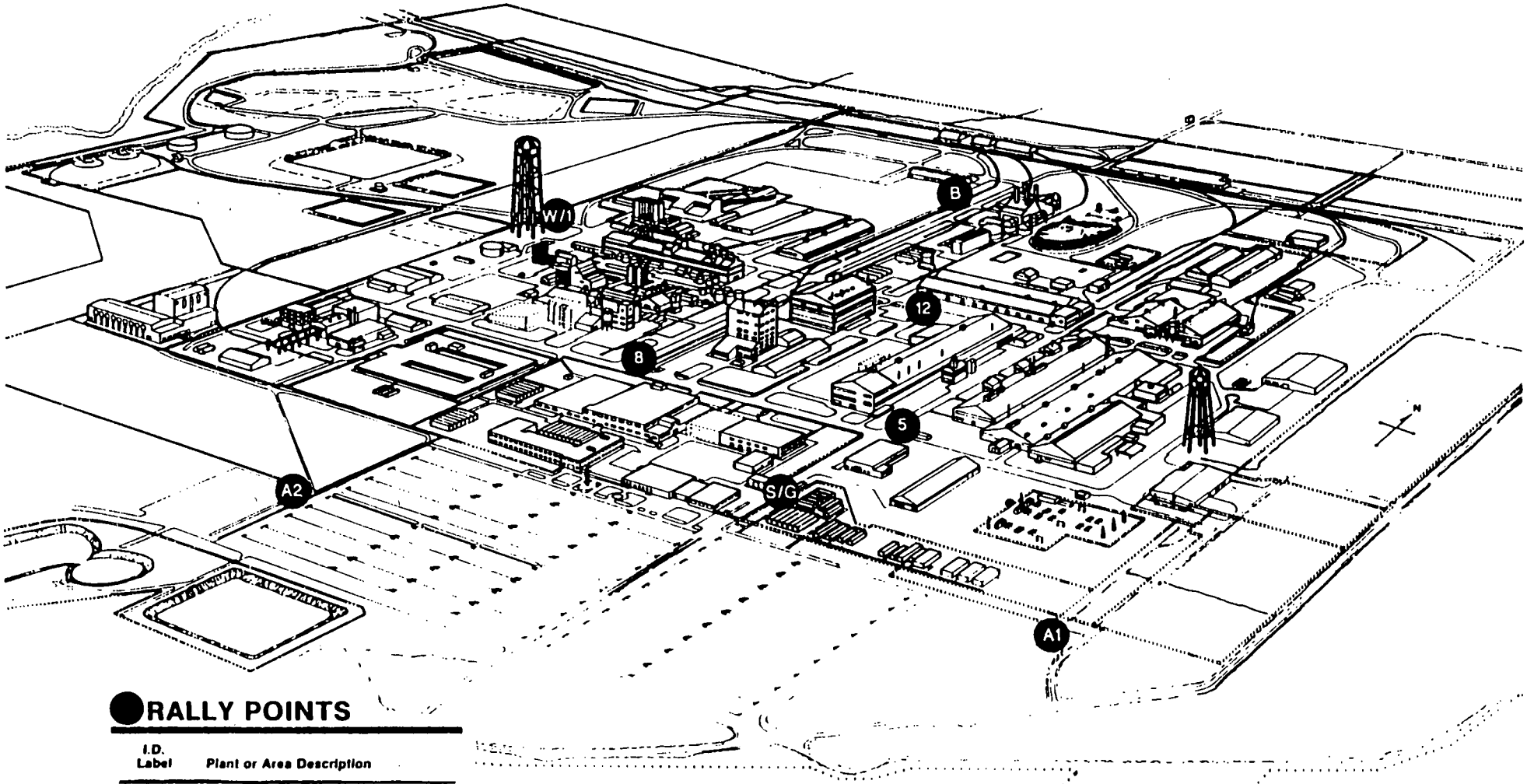
A. M. KINNEY, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

WASTE PIT AREA STORMWATER CONTROL
SAMPLE BORING PLAN

87-D-159 | 0087502 WBS 1.2.4.0 | WP-1 | A

FMPC RALLY POINTS



RALLY POINTS

I.D. Label	Plant or Area Description
A1	Administration
A2	Alternate Administration
B	Boiler Plant
S/G	Security & Garage
W/1	Waste Pit Area & Plant 1
5	Plant 5
8	Plant 8
12	Building 12

FIGURE 2

000067

ROUTE TO FMPC MEDICAL FACILITY

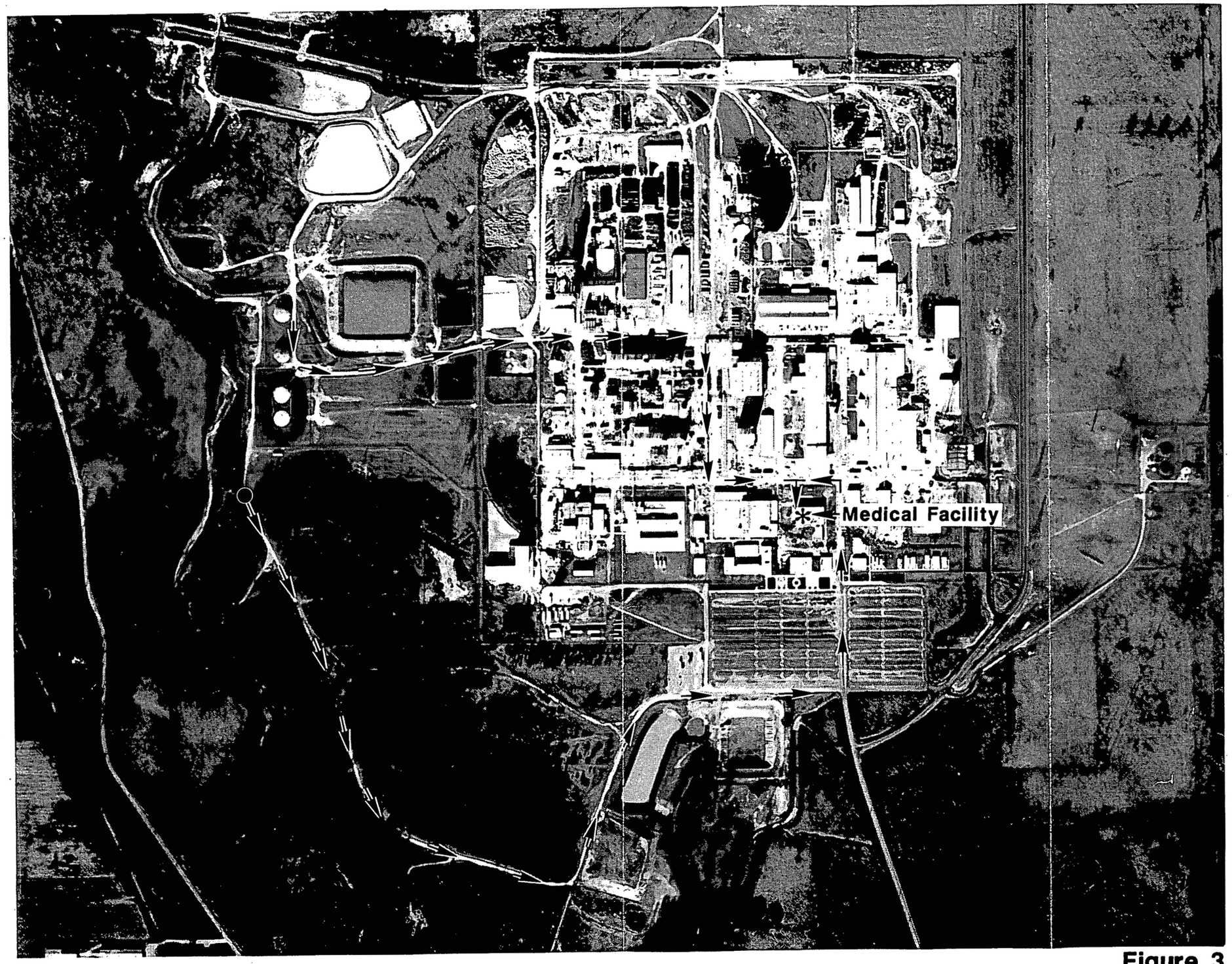


Figure 3

WMCO Graphics #1212

RESPONSE TO

U.S. EPA COMMENTS ON

THE WASTE PIT AREA STORMWATER RUNOFF CONTROL

REMOVAL ACTION WORK PLAN

General

The letter transmitting the U.S. EPA comments to the DOE site office refers to the "deficiencies" cited in the review comments as the basis for disapproval of the Work Plan. Follow-up discussions have been held and research of available guidance for preparation of Removal Action Work Plans has been conducted to develop interpretation of the requirements for information to be included. It is agreed that the questions and issues raised in the comments are relevant to the technical or programmatic aspects of removal alternative selection and implementation. The current position, however, is that including discussions in the Work Plan to address some of these issues (Comments 1, 2, and 3) would be inappropriate and not in keeping with the document's intent. Other items (Comments 5, 6, 7 8, 9, 11 and 14), though they are required for inclusion in the implementation plans of remedial actions as defined in the EPA Remedial Design/Remedial Actions Guidance Document, are not specific requirements for plans covering removals. The items requested can be provided for informational purposes once design activity for the removal action is completed.

Work Plan

Comment 1. A table providing a list of flow, average uranium concentration and total mass per year for each source and sampling point must be provided.

Response. The sources contributing to the Biodenitrification Surge Lagoon (BSL) presently include flows from the General Sump, Clearwell, Pit 6, and the recycle stream from the Biodenitrification System.

Presented below is information regarding the flows, average uranium concentrations, and an estimate of the mass per year from each of these sources. The mass per year estimate is based on the period of September 1989 through August 1990 for which data is presented.

General Sump to BSL:

	Average Flow (gal/day)	Average U conc. (mg/l)	Mass Uranium (Pounds)
September 1989	38,117	3.23	30.8
October 1989	34,290	4.07	36.1
November 1989	46,360	1.89	21.9
December 1989	49,435	2.05	26.2
January 1990	67,839	2.55	44.7
February 1990	55,413	2.51	32.5
March 1990	45,839	2.68	31.8
April 1990	41,017	1.74	17.9
May 1990	68,346	1.50	26.5
June 1990	39,783	1.92	19.1
July 1990	49,100	1.92	24.4
August 1990	43,790	1.31	14.8
	Total Mass, General Sump to BSL =		**326.7**

Clearwell to BSL

			Mass U. (Pounds)
September 1989	No water pumped from Clearwell to BSL	---	
October 1989	No water pumped from Clearwell to BSL	---	
November 1989			
Nov. 9	180,000 gallons	8.8 mg/l Uranium	13.2
Nov. 10	279,000 "	7.0 "	16.3
Nov. 11	253,000 "	7.1 "	15.0
December 1989	No water pumped from Clearwell to BSL	---	
January 1990			
Jan. 18	232,000 gallons	8.00 mg/l Uranium	15.5
Jan. 19	138,000 "	8.10 "	9.3
February 1990			
Feb. 1	136,000 gallons	8.15 mg/l Uranium	9.2
Feb. 2	208,000 "	11.01 "	19.1
Feb. 14	105,000 "	9.00 "	7.9
Feb. 15	26,000 "	9.48 "	2.1
Feb. 16	282,000 "	9.92 "	23.3
Feb. 17	96,000 "	9.44 "	7.6
Feb. 18	96,000 "	9.82 "	7.9
March 1990	No water pumped from Clearwell to BSL	---	
April 1990			
Apr. 11	341,000 gallons	8.07 mg/l Uranium	23.0
Apr. 12	294,000 "	7.13 "	17.5
Apr. 13	404,000 "	8.10 "	27.3
Apr. 14	399,000 "	9.34 "	31.1
Apr. 15	383,000 "	9.00 "	28.7
May 1990			
May 2	120,000 gallons	7.07 mg/l Uranium	7.1
May 14	439,000 "	8.43 "	30.5
May 17	161,000 "	7.98 "	10.7
May 18	307,000 "	7.94 "	20.3
May 18	435,000 "	9.94 "	36.1
June 1990			
Jun. 9	153,000 gallons	6.67 mg/l Uranium	8.5
Jun. 10	231,000 "	8.59 "	16.5
Jun. 11	231,000 "	8.62 "	16.6
July 1990			
Jul. 21	142,000 gallons	5.14 mg/l Uranium	6.1
Jul. 22	227,000 "	6.82 "	12.9
August 1990			
Aug. 17	176,000 gallons	8.54 mg/l Uranium	12.5

Total Mass, Clearwell to BSL = 451.8

BDN Recycle Stream

	Average Flow (gal/day)	Average U conc. (mg/l)	Mass Uranium (Pounds)
September 1989	14,400	1.27	4.6
October 1989	14,400	0.30	1.1
November 1989	14,400	2.07	7.5
December 1989	14,400	1.54	5.7
January 1990	14,400	2.22	8.3
February 1990	14,400	1.91	6.4
March 1990	14,400	1.27	4.7
April 1990	14,400	1.63	5.9
May 1990	0 (Note 1)	----	---
June 1990	0 (Note 1)	----	---
July 1990	0 (Note 1)	----	---
August 1990	0 (Note 1)	----	---

Total Mass, BDN Recycle Stream to BSL = 44.2

Note 1: Biodenitrification System Out of Service.

Pit 6 to BSL (pumped January 12, 1990)

Volume pumped estimated at 10,000 gallons 28.6 mg/l Composite sample.

Estimated Total Mass, Pit 6 to BSL = 2.4 Pounds

It should be noted that these flows contribute to the BSL regardless of the planned Removal Action. Approval of the Removal Action Work Plan should not be dependant on these flows.

Action. No action to be taken regarding Work Plan.

Comment 2. Conflicting information regarding the mass of uranium originating in the waste pit area and discharged to Paddy's Run has been presented. The total mass of uranium in untreated storm water run-off is reported as 150 pounds per year (response to U.S. EPA comment 162 on May 1990 Waste Pit EE/CA). The derivation of this estimate must be presented in the work plan. Data presented in the Federal Facility Compliance Agreement (FFCA) Clean Air Act and Liquid Discharge Report -- Quarterly Report of Liquid Radiation Discharge indicates that the estimate of uranium discharge to Paddy's Run from uncontrolled areas is based on 9.9 pounds per inch of rain. The annual rainfall at FMPC is approximately 40 inches. This results in 400 pounds discharged to Paddy's Run. This results in a 250 pound per year discrepancy.

Response. The apparent discrepancy regarding the mass of uranium discharged to Paddy's Run is due to the comparison of masses of uranium originating from differing sources. The estimate of 9.9 pounds of uranium discharged for every inch of rainfall as reported in the

FFCA Clean Air Act and Liquid Discharge Report is based on the results of stormwater sampling of the uncontrolled sources of stormwater runoff for the entire 1050 acre site. These sampling results, along with measured surface areas for the contributing drainages, and a surface water run-off coefficient (assumed to be 0.4) were used to estimate a mass loading to Paddy's Run. This mass was then divided by the annual rainfall at the FMPC to arrive at the 9.9 pound per inch of rainfall rule of thumb. The concentrations of uranium in these uncontrolled areas is very low, however, the volume of stormwater runoff from these areas is huge. Therefore, an **estimate** of the mass of uranium leaving the site from these areas is on the order of pounds per inch of rainfall.

The estimated 150 pounds of uranium discharged from the uncontrolled waste pit area is based the following information:

a. 23 gallons per minute average flow
b. Estimated 1 mg/l uranium concentration[1]

The mass loading based on this information is approximately 100 pounds of uranium per year, however, since the concentrations in the combined stormwater flows from this area have been measured at higher levels, a conservative estimate of 150 pounds of uranium per year was used.

Action. No action to be taken regarding Work Plan.

Comment 3. Conflicting information regarding uranium concentration of storm water run-off originating in the waste pit area has also been presented. U.S. DOE reported an average concentration of 1 mg/l for run-off (response to Comment #3 in Attachment IV). U.S. DOE reported an average concentration of 1.7 mg/l (May 1990 Waste Pit EE/CA). U.S. DOE reported a flow weighted average of 8.27 mg/l at sampling point 603 (overflow from clearwell) in the Quarterly Report of Liquid Radiation Discharge covering the period of April through June. These apparent discrepancies must be resolved.

Response. As stated in the response to Comment 2, the 1 mg/l uranium concentration estimate is based on the sampling results for sampling point # 26. The data for this sampling point is believed to represent the most likely concentration for the waters that will be collected by this removal action since this sampling point is downstream of several other sampling points and represents combined flows from the area. However, the actual concentration of the collected waters will not be known until the project has been implemented and additional sampling is completed. The estimate of 1.7 mg/l uranium (reported as 1700 micro grams/l uranium in the May 1990 Waste Pit EE/CA - page 5-6) is an estimate of the uranium in surface water runoff from the waste pit area and was used for the purpose of risk assessment. This value is based on 95 percent confidence level and is therefore a conservative number for risk assessment purposes. It should be noted that the implementation of this removal action will not

[1] A concentration of 1 mg/l was estimated based on the data available for sampling point #26. This sampling point represents the closest sampling location to the proposed central collection point for this removal action. It should be noted that these are only estimates based on the available data and that the actual concentrations in the stormwater that will be collected after implementation cannot be determined exactly until after construction and additional sampling. This is because several of the existing drainage areas will be rerouted and will not flow to the points where they currently flow, while other areas will be collected that currently flow to Paddy's Run via different routes.

change based on the differences noted. The fact remains that contaminated stormwater runoff is currently being discharged directly to Paddy's Run and that implementation of this removal action will prevent this discharge.

This comment also notes a flow weighted average concentration of 8.27 mg/l at sampling point 603 (discharge from Clearwell). This implies that this concentration is representative of the stormwater runoff from the waste pit area, however, the historical use of the Clearwell needs to be considered before this conclusion can be made. Historically, the Clearwell served as the final stilling basin for Pit 3 and then for Pit 5. In this mode of operation, uranium laden particulates settled in the Clearwell. The current flows to the clearwell include stormwater flows from both Pit 5 and from the majority of the covered surfaces of Pits 1, 2, and 3. Because of the Clearwell's past use, the flows that now originate in the Clearwell are not representative of stormwater runoff flows from the waste pit area.

Action. No action to be taken regarding Work Plan.

Comment 4. Applicable or relevant and appropriate requirements (ARARs) must be considered for this removal action. Applicable requirements includes groundwater monitoring for land-based units (surface impoundments) that receive contaminated water.

Response. If it is determined that the collection sump or the Biodenitrification Surge Lagoon (BSL) will be a RCRA unit, then an appropriate groundwater monitoring program would be established based on Ohio Administrative Code 3745-65-90: Groundwater Monitoring - Applicability. If the collection sump is not determined to be a RCRA unit, then an in-house groundwater monitoring program would be established based on Best Management Practices. The decision as to whether or not the collection sump or the BSL are to be treated as RCRA units will not be made in this Work Plan.

Action. No action to be taken regarding Work Plan.

Comment 5. U.S. EPA guidance requires that the work plan include a discussion of a preliminary operations and maintenance manual to be completed at the final design stage.

Response. It is DOE's interpretation of U.S. EPA Guidance Document #OSWER 9355.0-4A, that the subject information is not a prerequisite for the approval and implementation of the Work Plan, since this project is not a remedial action, but a removal action.

However, we are in agreement that information of this nature needs to be made available to all parties for informational purposes. A preliminary operation and maintenance plan will be developed and be issued in the form of a standard operating procedure (SOP). The SOP will cover operation and maintenance of this facility.

Action. Include the following paragraph in Section 3.1 of the Work Plan:

"Specific items will be made available to the U.S. EPA upon completion of the engineering phases of the scope of work. These items will include

information regarding the discussion of a preliminary operations and maintenance manual, cost estimate, and detailed schedule indicating project planning activities."

The above information, based on an approximate 90% design completion at present, will be forwarded to the U.S. EPA after submittal of the work plan.

Comment 6. U.S. EPA guidance requires that the work plan include a discussion of a Quality Assurance Plan for construction related sampling and testing to be completed at the final design stage.

Response. Refer to response for Comment 5.

Action. Refer to action for Comment 5.

Comment 7. In accordance with U.S. EPA guidance, a preliminary design submission (at 30% complete) should be provided.

Response. Refer to response for Comment 5.

Action. Refer to action for Comment 5.

Comment 8. U.S. EPA guidance requires that the work plan include a discussion of cost estimates to be completed at the preliminary and final design stages.

Response. Refer to response for Comment 5.

Action. Refer to action for Comment 5.

Comment 9. A detailed list of costs must be provided.

Response. Refer to response for Comment 5.

Action. Refer to action for Comment 5.

Comment 10. Section 2.3, page 4, paragraph 4: It appears that Westinghouse will be preparing plans and specifications. This should be clarified in the text and the design firm should be identified.

Response. Westinghouse has contracted an Architect-Engineer, A.M. Kinney, Incorporated, to perform design services for this action under the Environmental Health & Safety Improvements Line Item Project. We agree that this information can be included in the Work Plan.

Action. Include the following reference: A.M. Kinney, Inc., as the design consultant, is responsible for the preparation of the design plans and specifications.

Comment 11. Section 3.1a, page 6: project planning activities should be presented and addressed in the preliminary design review. Planning activities do not appear in the Attachment I schedule.

Response. Refer to response for Comment 5.

Action. No action required regarding the Work Plan.

Comment 12. Section 4, page 5, paragraphs 7 & 8; page 8, paragraphs 1 & 2: the installation requires excavation of a large volume of contaminated soils. Disposition of these soils and application of ARARs must be discussed.

Response. The contaminated soil excavations resulting in this Removal Action will be controlled and dispositioned by existing FMPC site policies and procedures and as defined in detail in this Work Plan and in the Sampling & Analysis Plan. The disposition of the excess soil is based on the criteria given in Response 18.

Action. Work Plan will be modified to include this information.

Comment 13. Section 5, page 9: discussion is needed here in Attachment II of samples to be collected to evaluate the permeability of the detention areas.

Response. Agreement. We have included this information in Section 5 of the Work Plan but not in the Sampling and Analysis Plan as it is considered field study information for design purposes only. Information included in the Sampling and Analysis Plan is related primarily to characterization and environmental monitoring requirements.

Action. Modify the first sentence, second paragraph of Section 5 to read as follows:

> "Additional sampling and analysis, including the verification of a maximum permeability of 1×10^7 cm/sec in the detention areas, will be performed to support the implementation of this removal action.
> Proposals will be requested of experienced geologic consultants for the purpose of verifying this permeability. in the detention areas. The selected consultant will perform both field and laboratory tests for verification of the permeability factor."

Attachment I -- Removal Action Schedule

Comment 14. Dates should be included in the schedule, with a consistent scale. Time should be included for a preliminary design review at about 30% complete, in accordance with U.S. EPA guidance.

Response. The schedule, as revised, is meant to be a high level summary of the phased activities of the project, including the minimum logic constraints, and the time point at which this specific phase begins after approval of the Work Plan. We are in agreement that the time zero line should be dated and a consistent scale be utilized. With regard to the design review issue, refer to response and action of Comment 5.

Action. A more detailed schedule will be made available to the U.S. EPA.

Comment 15. The 135-day design time-frame is excessive, especially in light of the fact that this project has been planned for several years.

Response. We are in agreement that the 135 day design time is excessive based on the present 90% design completion status, and on the basis that the treatment system is no longer required. However, the sequence of necessary events for verification of the maximum permeability requirement, and thus, the possible need to modify the consultant's contract, and complete design documents, will require a substantial procedural duration.

Action. Reduce the overall design time from 135 days to 90 days.

Attachment II -- Sampling and Analysis Plan

Comment 16. Discussions regarding treatment should be updated to reflect current agreement for treatment of contaminated water.

Response. DOE concurs.

Action. Sections of the Work Plan that contain discussions regarding the water treatment will be modified. All references to the 10 gpm pilot scale treatment system will be deleted.

Comment 17. Page 2: the sampling scheme for the construction phase of the removal action is not described in sufficient detail. The plan only states that sampling will be conducted during the removal action.

Response. The Work Plan and Sampling and Analysis Plan will be revised to include discussion on the frequency of soil sampling both during the excavation activities, and post excavation activities. This data is to be used to certify the build over requirements established by site policies and procedures are satisfied. The sampling and analysis plan will also discuss the analysis required for each sample and define the laboratory to be used and the associated quality assurance requirements.

Action. Sampling and Analysis Plan will be modified to include indicated information.

Comment 18. Page 2: it is unclear what is meant by "build over" of contamination. This should be further explained. What is the criteria for "build over"?

Response. "Build over" is defined as the construction of a permanent structure over the affected area. Removal and movement of soils as part of this removal action will be executed only to the extent necessary to attain required construction grades and to ensure that an interim residual radioactivity (new construction) build over criteria of 35 pCi/g of total uranium is attained as averaged over an established grid interval.

The criteria of 35 pCi/g (52 ppm) of total uranium in soil has been adopted as a removal action cleanup level pending the establishment of final cleanup standards through the RI/FS process. We believe that the selected criteria represents a conservative action level which is both protective of human health and the environment, and is consistent with DOE, NRC policies and guidance and consistent with cleanup levels previously accepted by the U.S. EPA. The criteria was adopted from the NRC Branch Technical Position as presented in the Federal Register on October 23, 1981. The NRC Branch Technical Position presents five options for the disposal or on site storage of thorium or uranium wastes from past nuclear operations. Option 1 of the NRC Position paper proposes residual radioactivity guidelines for natural thorium and depleted and enriched uranium for properties with no future land use restrictions. For depleted uranium, the NRC position paper proposes a residual radioactivity guideline of 35 pCi/g under the unrestricted future use scenario.

Action. Work Plan will be modified to include this information.

Health & Safety Plan

Comment 19. Section 3.3, page 6: radon and radon-decay monitoring that will be performed should be presented. Location and instrumentation should be specified.

Response. Radon monitoring is an on-going effort at the FMPC. The extent of this monitoring is described in the yearly FMPC Environmental Monitoring Report. The instrumentation used for the purpose of determining radon releases are located as shown in the EMR. The primary source of radon gas at the FMPC is the K-65 silos, therefore, extensive continuous monitoring instruments are employed around the silos and the results are reviewed on a regular basis. The data has supported the conclusion that unless the silos are being opened for sampling purposes, the radon gas levels in the vicinity of this removal action are normally below the field action limits given in Section 4.3. These on-line, continuous radon gas monitors will be used by WMCO personnel during the execution of this removal action. The description of the monitoring is given in Section 4.2.3.1 of the Health & Safety Plan.

Action. Health & Safety Plan will be revised as stated above.

RESPONSE TO

OHIO EPA COMMENTS ON

THE WASTE PIT AREA STORMWATER RUNOFF CONTROL

REMOVAL ACTION WORK PLAN

EE/CA Comments

Comment 1. Comment #15: DOE's response to Comment 15 states that total uranium concentrations measured at sample point 24 in Area A after 10/88 are representative of the concentrations which will continue to flow to Paddy's Run from Drainage Area A after the implementation of the EE/CA. These total uranium concentrations range from 111 to 223 ug/l. This concentration will continue to leave the FMPC and provide a route of exposure to the public (via drinking water, etc.). The fact these levels are below the DOE DCG's is insufficient justification for their continued release. The acceptability of the continued release of these levels of uranium should be evaluated based upon risk, as outlined in U.S. EPA's Risk Assessment Guidance for Superfund, not upon DOE's DCG's. Non-radiological contaminants which may be released via Drainage Area A should also be included in this risk analysis. Thus based upon risk, DOE needs to justify their failure to include Drainage Area A in the run-off collection system.

Response. The objective of the Waste Pit Area Stormwater Runoff Control Removal Action is to address the uncontrolled stormwater runoff from the waste pits and a perimeter area that flow to Paddy's Run. Other sources of uncontrolled stormwater leaving the FMPC site will be addressed by either Operable Unit 3 - Production Area and Additional Suspect Areas, or by Operable Unit 5 - Environmental Media. Drainage Area "A" is considered to be one such area that will need to be evaluated by one or both of these Operable Units. It is anticipated that additional sources of contaminated, uncontrolled stormwater runoff will be addressed by localized soil removal and remediation. When compared to stormwater collection from these miscellaneous areas, localized soil removal/remediation would offer a more practical approach that would be consistent with the final remediation activities for Operable Units 3 and 5.

Additionally, it would be impossible to attempt to collect the volume of stormwater runoff from Drainage Area "A" with the system as currently designed. The volume of stormwater that would be contributed by Drainage Area "A" is roughly equal to all other sources currently planned to be collected by this removal action.

Action. No action required for EE/CA or Work Plan.

Comment 2. Comment #17: DOE's response to this comment refers to the tendency of stormwater run-off to infiltrate within Drainage Area G and also states that Drainage Area G will provide emergency overflow capacity for the new Collection Sump. The tendency for water to infiltrate within Area G does not make it a preferred emergency overflow, since it may facilitate uranium contamination entering the groundwater. The system was designed for a 100

year/24 hour event and overflow should be rare, but the Stormwater Retention Basins were designed for a 10 year/24 hour event and have overflowed seven times in the four years since being put into service. Thus, DOE should consider actions to minimize infiltration within Drainage Area G, if it is to be used as an emergency overflow.

Response. The Waste Pit Area Stormwater Runoff Control Removal Action as currently designed is based upon a 25 year / 24 hour event (one level more conservative than the Stormwater Retention Basin design). The system was then checked using a 100 year / 24 hour event and proved to be adequate. The option of providing an emergency overflow to Area "G" further reduces the likelihood that the system will be overloaded. The alternative to this was to allow overflow to discharge directly to Paddy's Run and have no means of retrieving any overflowed stormwater. Given that this extremely unlikely scenario would occur, then expedient measures would be per operations and maintenance SOPs to remove some of the water from Area G. In addition to providing a means of retrieving some or all of any potential overflow, the current design provides instrumentation that would quantify the volume of an overflow.

In addition to the limiting factors (low probability events coupled with the emergency overflow Area G) this system differs in concept from the Stormwater Retention Basin (SWRB) design in that it need only have the capability to transfer the peak storm flows, while the SWRB must contain the entire volume of the storm event. This key difference makes the SWRB much more susceptible to sequential storm events.

DOE has considered actions to minimize infiltration within Area "G", however this action would then require any accumulated stormwater within this area to be transferred during and after each rainfall event. If the accumulated stormwater was transferred to the collection sump, the likelihood of an overflow would be increased since more flow is being added to the collection sump. Because these actions are inherently self-defeating, no actions other than expedient and practical measures in a rare situation will be taken to minimize the infiltration within Area "G".

Action. No action required for EE/CA or Work Plan. General measures may be incorporated into SOPs for operation and maintenance.

Work Plan Comments

Comment 1. Page 6, second paragraph: DOE's decision to use Drainage Area G as an emergency overflow is questioned. In response to previous Ohio EPA Comments, DOE has suggested that stormwater run-off tends to infiltrate within area G does not make it a preferred emergency overflow, since it may facilitate uranium contamination entering the groundwater. The infiltration would also limit the efficiency of any plan to pump water out of the basin after the event occurred. Ohio EPA is unsure as to whether any permeability measurements have been conducted in this area, but it would appear that such steps should be taken so that an estimate of the amount of water, which may infiltrate during an overflow event, can be made. The system was designed for a 100 year/24 hour event and overflow should be rare, but the Stormwater Retention Basins were designed for a 10 year/24 hour event and have overflowed seven times in the four years since being put into service. Thus DOE should also consider

actions to minimize infiltration within Drainage Area G, if it is to be used as an emergency overflow.

Response. See response to Comment 2 above.

Action. No action required for Work Plan, however, permeability tests are to be conducted to ascertain whether or not the detention areas meet the maximum permeability of 1 X 10^{-7} cm/sec as required.

Comment 2. Page 6b and Schedule - Ohio EPA was under the impression that the design work for this project was virtually complete. It would seem that the 135 calendar days required for this task could be cut significantly.

Response. The required design time has been shortened to 90 days due to 1) elimination of the 10 gpm pilot scale treatment system, and 2) the assumption that the design will need to be completed after the permeability analysis; the analysis sequence of events is also included in the revised duration.

Action. An updated schedule has been prepared and has been included in the revised Work Plan.

Comment 3. NEPA Documentation - Waste Generated - The last sentence should state that the 26 kgs. would have previously been discharged to Paddy's Run or the Great Miami River.

Response. Due to the elimination of the 10 gpm pilot scale treatment facility, this portion of the Work Plan has been deleted. Due to this elimination, there is no requirement to amend the NEPA documentation and, therefore, Attachment V has been removed.

Action. No action is required regarding the Work Plan.

Comment 4. Health & Safety Plan page 22 12.7.1. Hospitals - If DOE has provisions for a "Life Flight" helicopter transport to a nearby hospital it should be stated in this section. If DOE does not have this arrangement set up they should consider it with the amount of remedial work planned at the site.

Response. DOE does have provisions for "Life Flight" helicopter transport to area hospitals.

Action. The Health & Safety Plan has been modified to reflect the availability of "Life Flight" helicopter transport.

Comment 5. Sampling & Analysis Plan - page 4 - Table at the top of the page - No minimum volumes are given for strontium 90 and ruthenium 106 and the maximum holding times are in the wrong columns.

Response. The Sampling & Analysis Plan has been modified. Based on engineering judgement, U.S. DOE has decided that monitoring/analysis for uranium and thorium materials is sufficient to detect levels of contamination in the soils involved. Therefore the analysis for all other radionuclides has been deleted from the plan.

Action. The Sampling & Analysis Plan has been modified to reflect this and other comments received.