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**CONSOLIDATED CONSENT AGREEMENT/
FEDERAL FACILITY COMPLIANCE
AGREEMENT/FEDERAL FACILITY AGREEMENT
MONTHLY PROGRESS REPORT PERIOD ENDING
FEBRUARY 29, 1992**

03/20/92

**DOE-FN/EPA
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REPORT**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
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Introduction

The Consent Agreement (CA) As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a), the Federal Facility Compliance Agreement (FFCA), and the Federal Facility Agreement (FFA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA) signed September 20, 1991, July 18, 1986, and November 19, 1991, respectively, require that monthly reports be submitted to the U.S. EPA regarding progress made to meet the provisions of those agreements. This report fulfills those requirements by describing actions undertaken at the Fernald Environmental Management Project (FEMP) during the period February 1 through February 29, 1992 and planned actions for the period March 1 through March 31, 1992.

Highlights of activities in February include the following:

- Having received verbal approval from the U.S. EPA and the written approval from Ohio EPA to delete the Delta Steel from the South Plume removal action scope of work, the Certified for Construction (CFC) documents were revised and reissued on February 6, 1992. The Invitation for Bid (IFB) package for this work was issued February 7, 1992.

- A Permit to Install (PTI) was prepared and issued to the Ohio EPA on January 31, 1992 (including Delta Steel). The accompanying test well report was issued on February 10, 1992. The PTI and accompanying test well report were issued to the U.S. EPA for informational purposes.

- A revised South Plume removal action Parts 2/3 Work Plan was prepared and issued to the U.S. EPA and Ohio EPA on February 3, 1992. The revised Work Plan was expanded to include:

- A pump test at the center of the proposed five unit well field with discharge to the Stormwater Retention Basin (SWRB)
- Increased pumpout capacity at the SWRB to minimize potential SWRB overflows.

- Responses to the comments received on the Operating and Maintenance (O&M) Plan for the Part 2 well field were prepared and issued to the U.S. and Ohio EPAs.

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Introduction (cont'd)

- The Work Plan for the Active Flyash Pile Controls Removal Action was completed and submitted ahead of schedule to U. S. EPA on February 18, 1992.
- The initial Safety Assessment for Safe Shutdown activities was completed in February as planned. The Safety Assessment requires that a hazard survey be conducted for each plant within the former process area.

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WORK ASSIGNMENTS AND PROGRESS

Descriptions of work progress are presented in the following sections and/or enclosures to this report:

- o CA Section IX - Removal Actions.
- o CA Section X - Remedial Investigation/Feasibility Study.
- o Enclosure A - Wastewater Flows and Radionuclide Concentrations under CA Section XXIII.B.
- o Enclosure B - FFCA: Initial Remedial Measures and Other Open Actions.
- o Enclosure C - FFA: Control and Abatement of Radon-222 Emissions.
- o Enclosure D - Drilling/Boring Logs.

CA Section IX. Removal Actions

This section provides an update of activities associated with the implementation of Removal Actions (RAs) at the FEMP during February 1992. Information is presented for each of the Removal Actions identified in the Consent Agreement As Amended.

Phase I Removal Actions

- o RA No. 1, Contaminated Water Under FEMP Buildings.
- o RA No. 2, Waste Pit Area Run-off Control.
- o RA No. 3, South Groundwater Contamination Plume.
- o RA No. 4, Silos 1 and 2.
- o RA No. 5, Decant Sump Tank.
- o RA No. 6, Waste Pit 6 Residues.
- o RA No. 7, Plant 1 Pad Continuing Release.

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CA Section IX. Removal Actions (cont'd)

Phase II Removal Actions

- o RA No. 8, Inactive Flyash Pile Control.
- o RA No. 9, Removal of Waste Inventories.
- o RA No. 10, Active Flyash Pile Controls.
- o RA No. 11, Pit 5 Experimental Treatment Facility.
- o RA No. 12, Safe Shutdown.
- o RA No. 13, Plant 1 Ore Silos.
- o RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator.
- o RA No. 15, Scrap Metal Piles.
- o RA No. 16, Collect Uncontrolled Production Area Runoff--Northeast.
- o RA No. 17, Improved Storage of Soil and Debris.
- o RA No. 18, Control Exposed Material in Pit 5.

Phase III Removal Actions

- o RA No. 19, Plant 7 Dismantling.
- o RA No. 20, Stabilization of UNH Inventories.
- o RA No. 21, Expedited Silo 3.

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CA Section IX. Removal Actions (cont'd)

Proposed Phase III Removal Actions

- o RA No. 22, Waste Pit Area Containment Improvement.
- o RA No. 23, Inactive Flyash Pile.
- o RA No. 24, Pilot Plant Sump.
- o RA No. 25, Nitric Acid Tank Car and Area.
- o RA No. 26, Asbestos Removals (Asbestos Program).
- o RA No. 27, Management of Contained Structures at the FEMP.

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RA No. 1, Contaminated Water Under FEMP Buildings

Plant 6 - Pumping and collection of the perched water from underneath Plant 6 began on May 31, 1991. Through February 1992, approximately 18,700 gallons of perched groundwater have been collected and transported for treatment by the Plant 8 VOC treatment system.

Plants 2/3 and Plant 8 - The Plants 2/3 and Plant 8 extraction systems became operational on October 23, 1991. Through February 1992, approximately 46,200 gallons of perched water have been collected for treatment from Plant 2/3 and approximately 27,900 gallons of perched water have been collected for treatment from Plant 8.

Plant 9 - Pumping from Plant 9 began on August 20, 1991 in accordance with the U.S. EPA and U.S. DOE milestone. Approximately 11,900 gallons of Plant 9 perched water have been extracted and collected through February 1992.

Plant 8 - The startup date for the Plant 8 treatment system was July 24, 1991. Through February 1992, approximately 102,400 gallons of groundwater have been transported and treated utilizing the Plant 8 system.

All activities to support the deliverables identified in the three U.S. EPA approved Removal Action Work Plans have been completed. Pumping of perched water beneath the four plants will continue in accordance with the Work Plan provisions.

RA No. 2, Waste Pit Area Runoff Control

The Work Plan for the Waste Pit Area Runoff Control Removal Action was approved with modifications by the U.S. EPA on January 10, 1991. Conditional approval was received from the Ohio EPA on April 2, 1991.

Field studies showed permeability factors as high as 1×10^{-3} cm/sec in the north and east detention areas. As a result of these field studies, modifications in the form of a soil liner have been made to the design for these detention areas.

Construction activities have been ongoing since June 6, 1991. Three of the eight construction sequences for the Waste Pit Area Runoff Control Removal Action have been completed.

The stock piles generated from the excavated soil from the sump have been characterized within the 30 days as included in the revised Sampling and Analysis Plan.

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RA No. 2, Waste Pit Area Runoff Control (cont'd)

Activities in February included continued construction of the sump/pump system which is over 80% complete. Trench drain installation is underway at the north end of the site and the south end with 35% complete. All underground piping, including the new 12" force main, is installed.

Planned activities for March include the completion of the sump and install the pumps; the continuation of the installation of the trench drains; and, initiation of the installation of the bentomat liners at the north end of the site.

KEY MILESTONES	STATUS	DUE DATE
Completion of construction	Open	July 31, 1992

RA No. 3, South Groundwater Contamination Plume

Part 1

The Work Plan for Part 1, Alternate Water Supply for two industrial users, of the South Plume Removal Action was approved by the U.S. EPA on January 3, 1991. A summary of the most recent and ongoing activities for Part 1 are listed below:

- ASI/IT Test Well Report (final issue) was received February 5, 1992.
- Having received verbal approval from the U.S. EPA and the written approval from Ohio EPA to delete the Delta Steel scope of work, the Certified for Construction (CFC) documents were revised and reissued on February 6, 1992. The Invitation for Bid (IFB) package for this work was issued February 7, 1992.
- At the request of the U.S. EPA, a follow-up letter was issued to Delta Steel to clarify that they did not want the alternate water supply as designed. Subsequently, a letter was received from Delta Steel which confirmed their previous position. U.S. EPA was informed of this response at the February 25 monthly meeting. Accordingly, the U.S. EPA will issue a written concurrence to the deletion of Delta Steel from the current scope of work.

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RA No. 3, South Groundwater Contamination Plume (cont'd)

Part 1 (cont'd)

- Permit to Install (PTI) was prepared and issued to the Ohio EPA on January 31, 1992 (including Delta Steel). The accompanying test well report was issued on February 10, 1992. The PTI and accompanying test well report were issued to the U.S EPA for informational purposes.
- Survey, Soil Sampling, and Field Screening Analysis began the week of January 21 and was completed February 18, 1992.
- Access agreements with property owners is continuing. One property owner has refused access; the Corps of Engineers (COE) has prepared documentation to begin acquisition by condemnation proceedings on this property. One additional property requires either a right-of-entry for construction or an easement agreement before construction can begin. Because this owner has been cooperative, condemnation had not been anticipated. However, the lawyer for this owner has sent a list of 19 issues which must be addressed by DOE. The DOE will try to address the concerns, but has subsequently begun condemnation efforts in parallel assuming some of the issues cannot be resolved. If agreement on the nineteen issues is not resolved shortly, the Part 1 schedule will be impacted, and the DOE will have to request a schedule extension.
- The bid due date for construction has been extended to March 18, 1992.

Part 2

To expedite the Part 2 construction, the project was divided into four construction bid packages. These include: 2A - Groundwater discharge pipeline (pressure flow) and outfall pipeline (gravity flow) from south of Willey Road to and including Manhole 182B, 2B - Manhole 182B to Great Miami River and aeration facility, 2C - Recovery well field, and 2D - Test well installation and pump test. Part 2 follow-on activities include:

- The IFB documents for Construction Package 2A (main pipeline) were issued February 24, 1992. Pre-bid meeting for potential bidders was held February 27, 1992.
- Request for Proposals (RFP) were received for pre-purchase of high density polyethylene piping requirements. Technical review of the RFP was completed and a purchase requisition is expected to be issued in early March.

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RA No. 3, South Groundwater Contamination Plume (cont'd)

Part 2 (cont'd)

A revised Parts 2/3 Work Plan was prepared and issued to the U.S. EPA and Ohio EPA on February 3, 1992. The revised Work Plan was expanded to include:

- A pump test at the center of the proposed five unit well field with discharge to the SWRB
 - Increased pumpout capacity at the SWRB to minimize potential SWRB overflows
- Responses to the comments received on the Operating and Maintenance (O&M) Plan for the Part 2 well field were prepared and issued to the U.S. and Ohio EPAs.
- The bid due date has been extended to March 13, 1992.

Part 3

The Work Plan for Part 3 (the installation and operation of an IAWWT System to reduce uranium contaminant loading discharged to the Great Miami River to a level less than 1,700 pounds per year) was prepared as one work plan with Part 2. Due to the relocation of the Part 2 well field to an area having a higher concentration of uranium, the IAWWT system capacity was expanded in order to maintain the 1,700 pound per year maximum level. The IAWWT system will include two treatment units. The IAWWT unit located at the SWRB will have a nominal 300 gpm capacity and the unit located at the Bionitrification Treatment/Effluent Treatment System (IAWWT[BDN-ETS]) will have a nominal capacity of 100 gpm.

The investigation of the option for storing spent resin for use in the future Advanced Wastewater Treatment System (AWWT) has been ongoing. The investigation has led to a decision that the FEMP BDN-ETS Dewatering Facility (Building 18H) will be utilized for handling and packaging of spent ion exchange resin.

Construction activities are underway on utility services for the IAWWT(SWRB).

Revisions to the 100% drawings and specifications for the IAWWT(BDN-ETS) are underway to include the modifications required to provide the resin dewatering operation in the ETS Building. It was determined by Safety and Health that fire sprinklers will need to be installed in the ETS Building. Therefore, the scope of work is being expanded to include this recent change.

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RA No. 3, South Groundwater Contamination Plume (cont'd)

Part 4

A follow-up round of sampling of property owner drinking water wells along Ohio State Route 128 where previous above-background levels of uranium have been detected was completed during January 1992. This sampling is now on a quarterly basis except for the three wells (homeowners) receiving bottled drinking water. Those wells are sampled monthly. Fifty-six groundwater monitoring wells were sampled for water quality in the month of February. Data collected from these monitoring wells is used to satisfy RCRA regulations, track existing contamination, and monitor water quality at the perimeter of the FEMP site.

As part of the DOE-EPA monthly status meeting held at the FEMP on February 25, 1992, maps showing RI/FS wells sampling in the South Plume area for the second, third and fourth quarters of 1991 were shown to the U.S. EPA and OEPA. Isopleths of 10 to 100 $\mu\text{g/l}$ levels of uranium based on straight line interpretation of well data were plotted on the maps. This sampling is being done to support Part 4 of this Removal Action. The logic for the recently issued letter requesting a modification to the implementation philosophy for the Part 5 effort was presented based on the isopleths developed. The EPAs agreed in principle with the revised logic.

Part 5

A Part 5 was added to the South Plume in order to address the relocation of the Part 2 well field. The Part 5 will perform geochemical investigation of the area south of the well field to determine if 20 mg/l uranium in groundwater concentration is present downgradient of the well field.

In accordance with the agreement reached at the July 23, 1991 meeting between the DOE, the U.S. EPA, and the Ohio EPA, the scope of the Part 5 field investigation was expanded to include investigation of the area north and inclusive of the relocated Part 2 extraction well field. A revised Part 5 Work Plan was resubmitted to the U.S. EPA and the Ohio EPA. The U.S. EPA approved the Part 5 Work Plan. The Ohio EPA conditionally approved the Part 5 Work Plan with comments. Explanation of Significant Differences (ESD) document was included in the Administrative Record.

Access to all properties has been obtained for the area where the hydropunching and soil vapor survey was originally scheduled to be performed. Access to Delta Steel property, which was scheduled to receive additional monitoring wells, has been denied.

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RA No. 3, South Groundwater Contamination Plume (cont'd)

Part 5 (cont'd)

Comments on the conditionally approved Part 5 Work Plan were prepared and submitted with the hydropunch procedure to the U.S. EPA and the Ohio EPA on February 3, 1992. Ohio EPA approved the comment responses and the hydropunch procedure with exceptions to three additional concerns. DOE-FO is presently evaluating these concerns.

Other actions on Part 5 include responding to the Ohio EPA comments on the additional concerns on Part 5; awaiting the U.S. EPA's approval of the Part 5 response to comments; and, awaiting the U.S. EPA comments on DOE's concerns and revised implementation philosophy.

Work in March 1992 will focus on the implementation of the first phase of the Part 5 effort. This will involve installing the northern row of hydropunching. Based on analysis of sampling results from the first phase effort, an evaluation will determine what additional hydropunching will be required to define the 20 µg/l extent of contamination. If the evaluation of the first phase data indicates that the additional hydropunching effort should be changed from that described in the current work plan, a revised plan will be prepared and submitted to the U.S. EPA and the Ohio EPA for approval prior to beginning the additional effort.

RA No. 4, Silos 1 and 2

Installation of the bentonite in Silos 1 and 2 was completed on November 28, 1991. This was ahead of the scheduled commitment date of December 1, 1991.

A Silos 1 and 2 Removal Action, Bentonite Effectiveness Monitoring Plan, that describes the methodology and computer model that will be used to determine the effectiveness of the bentonite in attaining the .015 pCi/l goal was submitted to the U.S. EPA on January 27, 1992. On February 19, 1992, the plan was disapproved by the U.S. EPA. The only remaining issue is calculating the conversion from measured headspace radon concentration to flux from the dome. Also in February, field activities were completed on the installation of the data logging system. Work in February 1992 also included initial collection of radon data to be submitted as part of the Consent Agreement Monthly Report.

Final calibration and system checkout will be initiated in March 1992. The data logging system will automatically record data for the following: Silos 1 and 2 headspace radon monitoring, Silos 1 and 2 headspace humidity monitoring, Silos 1 and 2 temperature and pressure monitoring, and four K-65 area exclusion radon gas monitors.

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RA No. 4, Silos 1 and 2 (cont'd)

As defined in the Removal Action Work Plan and the Federal Facility Agreement, data associated with monitoring the effectiveness of the bentonite installation are included in Enclosure C.

KEY MILESTONES	STATUS	DUE DATE
Complete installation of bentonite slurry into Silos 1 and 2	Completed November 28, 1991	December 1, 1991
Submit Bentonite Monitoring Plan	Completed January 27, 1992	January 27, 1992
Report monitoring results for bentonite effectiveness of EPA - 1st run 4/92	Open	May 22, 1992

RA No. 5, K-65 Decant Sump Tank

Removal of the liquid from the K-65 decant sump tank was completed on April 16, 1991 when the liquid was transferred to the holding tanks in Plant 2/3.

The analytical results for the general water quality parameters, Hazardous Substances List (HSL) volatile organics, HSL semi-volatile organics, and HSL pesticide organics and inorganics were received for the three samples of the decant liquid taken during the implementation of the Removal Action. Once the analytical results of the full radiological analyses for the three samples of the decant liquid are validated and evaluated, the treatment option will be determined.

The liquid pumped from the K-65 decant sump tank is being stored in the Plant 2/3 holding tanks.

Work in March 1992 will center on preliminary determination of the required treatment based on the available analytical results.

KEY MILESTONES	STATUS	DUE DATE
Complete the removal of the liquid from the K-65 decant sump tank	Completed April 16, 1991	April 26, 1991

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RA No. 6, Waste Pit 6 Residues

This removal action was completed on December 19, 1990. The only remaining issue related to the Waste Pit 6 Exposed Material Removal Action involves the placement of air monitors to augment the site requirements for estimating the off-site releases of potentially harmful contaminants. The monitors have been procured. Installation is expected in early CY1992. The final Waste Pit 6 Exposed Material Removal Action Final Report was completed.

RA No. 7, Plant 1 Pad Continuing Release

The removal action consists of three phases. Phase I, which implements the run-on/off control measures, is complete. Phase II addresses the installation of 80,000 square feet of a newly covered and controlled concrete storage pad. Phase III involves activities to upgrade the remaining 375,000 square feet of the existing Plant 1 storage pad. The Phase III upgrading activities include installation of a polymeric vapor barrier over the existing concrete and the installation of concrete above the barrier with an epoxy sealant. In addition, 22,000 square feet of the Phase III work area will be enclosed beneath a tension structure.

Activities in February included the procurement of materials and excavation of approximately one-third of the soil for the Phase II work. Planning for the post-excavation sampling of the Phase II area continued.

Activities in March will include the continued excavation of the Phase II soils by the construction contractor. Planning for the post excavation sampling of the Phase II area will continue.

KEY MILESTONES	STATUS	DUE DATE
Complete Phase I	Completed January 17, 1992	March 13, 1992
Complete Phase II	Open, on schedule	December 21, 1992
Complete Phase III	Open, on schedule	February 21, 1995

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RA No. 8, Inactive Flyash Pile Control

The Inactive Flyash Pile Isolation Activity, which involved the installation of a plastic chain link fence and the posting of warning signs, was completed ahead of schedule on December 24, 1991.

There are areas of elevated contamination which Ohio and U.S. EPA has asked to be evaluated further. Consequently, during January of 1992, a field instrument survey was conducted and two areas were identified, isolated, and posted with radiological warning signs.

During February, a magenta rope was attached to the top of the posts which support the perimeter chain barrier, and radiological controlled area signs have been posted.

Further characterization of surface contamination at the Inactive Flyash Pile and Other South Field Disposal Areas have been initiated to determine the need for action. The results of this evaluation are due to the EPAs by June 30, 1992.

RA No. 9, Removal of Waste Inventories

During February 1992, 6,387 drum equivalents (DE) of low-level waste (LLW) were dispositioned. The February goal for shipments was 7,714 DEs. The FY1992 cumulative total LLW shipped is 36,530 DEs.

KEY MILESTONES	STATUS	DUE DATE
Update existing internal procedures to ensure that appropriate shipping documentation is entered into the administrative record file	To be updated annually	June 30, 1992

The status of 30,000 DEs of backlog waste regarding waste characterization has been established. Efforts are now underway to ship containers which have been verified as nonhazardous low-level radioactive waste and complete characterization for those containers which have an undetermined status.

Projected activities for March include shipping 7,711 DEs of LLW. DOE-NV will have comments on the "FEMP Waste Application to Ship Waste to the Nevada Test Site" in March. A close out meeting regarding the 1991 Shipping and Thorium Audits is anticipated during March by DOE-NV.

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RA No. 10, Active Flyash Pile Controls

The Work Plan for the Active Flyash Pile Controls Removal Action was completed and submitted ahead of schedule to U. S. EPA on February 18, 1992.

Design for this removal action continues on schedule.

KEY MILESTONES	STATUS	DUE DATE
Submit Active Flyash Pile Work Plan to the U.S. EPA for approval	Completed February 18, 1992	March 2, 1992

RA No. 11, Pit 5 Experimental Treatment Facility

Removal Action No. 11 is in the construction phase. Work is proceeding on schedule. The Experimental Treatment Facility (ETF) structure and over 90% of its contents have been removed. The only material that remains is the "old" six mil liner and the 3" sand layer below. The remaining material will be removed once the soil beneath the ETF structure is sampled. Once the sand is removed, the Removal Action, as defined in the approved Work Plan, is considered complete. Sampling is scheduled for March 3, 1992.

There are no official quality control protocols for environmental radiochemical analysis other than the methods for radium and gross alpha and beta contained in SW-846. The FEMP Analytical Laboratory will utilize generally accepted radiochemical protocol to analyze samples taken in support of the ETF Removal Action. The quality control measures (spikes, duplicates, blanks, etc.) will be consistent with applicable FEMP and draft QAPjP QA/QC procedures.

Planned activities for March 1992 include the sampling of the soil from beneath the ETF structure; the removal, containerization, and on-site storage of ETF contents (approximately 9 cubic yards); and the sampling of containerized waste material.

KEY MILESTONES	STATUS	DUE DATE
Complete removal action within 120 days of Work Plan approval	Open, ahead of schedule	April 11, 1992 (based on Work Plan approval date of December 13, 1991)

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RA No. 12, Safe Shutdown

The Safe Shutdown Removal Action documents the ongoing shutdown activities that will remove uranium and other process raw materials from equipment and pipe lines in areas of formerly used processing equipment and will disposition the removed materials offsite.

KEY MILESTONES	STATUS	DUE DATE
Removal Action Memorandum Safe Shutdown Activities	Completed December 13, 1991	December 15, 1991
Provide a schedule for providing an update to the deliverable submitted pursuant to the compilation of existing site documentation supporting the ongoing Safe Shutdown programs by January 15, 1992	Completed	January 15, 1992
Update existing internal procedures to ensure that appropriate documentation is entered into the administrative record file	To be updated annually	June 30, 1992

The initial Safety Assessment for Safe Shutdown activities was completed in February as planned. The Safety Assessment requires that a hazard survey be conducted for each plant within the former process area. A rough draft of the task order to accomplish this has been issued to Parsons for comment.

As projected last month, the lesson plan requirements for Safe Shutdown operations have been completed, and the development of the lesson plans is scheduled for completion by July 1992.

The January 14, 1992, publication in the *Commerce Business Daily* of the 210,000 pounds of graphite did not generate any inquiries. Therefore, a list of previous graphite suppliers and potential candidates for interest in buying the graphite has been developed. An Invitation for Bid will be prepared and released to those on this list once funds are established to cover the write-off costs.

The inventory of Building 51 continued; a total of 2,000 expense items have been inventoried to date.

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RA No. 12, Safe Shutdown (cont'd)

The preliminary assessments for each major process area are continuing.

The capital equipment inventory continues; of an estimated total of 1,026 items to be inventoried, 670 have been put on AC-563 forms to be excessed, and 169 have been identified as "In Use/Future Use" items.

A meeting was held on February 24, 1992, with representatives of the Department of the Army, Aerojet Ordnance Tennessee, and DOE-FO on the project to transfer 70 items of clean excess derby breakout and slag milling systems. As a follow-up to this meeting, Aerojet will prepare a proposed scope of work for submittal to Safe Shutdown by March 16, 1992. Meanwhile, Project Management will move ahead with a preliminary hypothetical Construction Environmental Safety and Health Work Survey, Risk Assessment, Safety Assessment, and determine Industrial Hygiene and Radiological Safety constraints specific to this work.

Planned activities for March include:

- Initiate Maintenance work orders and start the equipment disconnects in Building 51.
- Relocate equipment that has no utility connections and materials from Building 51 to Plant 5, beginning the first week of March. These are being relocated to allow for the Advanced Waste Water Treatment (AWWT) project to proceed. As equipment disconnects are completed and all the equipment and materials are removed, a "shopping list" will be prepared to determine internal use. Items not identified for future use will be excessed.
- Assemble the task team and initiate the Risk Assessment Report.
- Finalize the task order to Parsons to conduct the hazard survey for each process area, along with a time schedule for completion.
- Issue a task order to EBASCO to prepare the task specific Health and Safety Plan for Safe Shutdown.
- Continue the preliminary assessments for each major process area.
- Continue the capital equipment disposition effort.

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RA No. 12, Safe Shutdown (cont'd)

Meet with Major James Sanders of the Department of the Army to finalize plans for the transfer of the entire remaining 4A inventory from the FEMP to the Defense Consolidation Facility in Snelling, South Carolina.

RA No. 13, Plant 1 Ore Silos

The Plant 1 Ore Silos Removal Action will include the dismantling of the Plant 1 Ore Silos and their support structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to structural deterioration of the silos and their support structure. The activities in this removal action will include characterization, removal, containerization, and disposal of the materials making up the above ground portion of the facility.

The Removal Action Work Plan was submitted to the U.S. EPA on January 9, 1992. Comments were received from both the U.S. and Ohio EPAs in February. The comments will be resolved and the revised Work Plan will be resubmitted in March 1992. March activities will also include continued design preparation.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U. S. EPA	Completed January 9, 1992	January 10, 1992
Receive U. S. EPA comments on the Work Plan	Received February 27, 1992	February 9, 1992
Submit Revised Work Plan to the U.S. EPA	Open, on schedule	March 30, 1992

RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator

This removal action will include the isolation or removal and disposition of contaminated soils in the vicinity of the Sewage Treatment Plant (STP). This will eliminate the potential threat of additional material releases to the environmental media through migration. The activities in this removal action will include characterization, removal, containerization, and storage/disposal of the materials.

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RA No. 14, Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (cont'd)

February activities included continued preparation for the implementation of the Removal Action, along with the receipt of U.S. EPA comments on the Work Plan. The Work Plan comment resolution, is planned for March 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Completed January 23, 1992	January 23, 1992
Receive U.S. EPA comments on the Work Plan	Received February 28, 1992	February 23, 1992
Submit Revised Work Plan to the U.S. EPA	Open, on schedule	March 30, 1992

RA No. 15, Scrap Metal Piles

The Scrap Metal Piles Removal Action will detail the stabilization and disposition of LLW scrap metal currently stockpiled onsite. This Removal Action will eliminate the potential threat of additional material releases to the environment due to wind, rain, or vehicular traffic. Approximately 1,300 tons of scrap copper along with approximately 3,000 tons of recoverable scrap metals are the focus of this Removal Action.

February activities included continued preparation for the implementation of the Removal Action. The Work Plan comment resolution is planned for March 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Completed January 31, 1992	January 31, 1992
Receive U.S. EPA comments on the Work Plan	Open	March 1, 1992

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RA No. 16, Collect Uncontrolled Production Area Runoff – Northeast

The scope of this removal action is to collect the remaining stormwater from the perimeter of the 136 acre production area that currently discharges to Paddy's Run and divert it through the existing storm sewer system to the SWRB.

- Draft Work Plan was issued to DOE-HQ for review and comment. Comments were received and are being incorporated. The revised document is on schedule for the required March 2, 1992, milestone delivery date to U.S. EPA
- NEPA documentation was approved
- Title II construction documents are being prepared

Work in March 1992 will focus on the issuance of the Removal Action 16 Work Plan.

RA No. 17, Improved Storage of Soil and Debris

This removal action will include the management and appropriate storage for contaminated soil and debris onsite. This will eliminate the potential threat of additional material releases to the environment due to wind, rain, or vehicular traffic. The activities in this Removal Action will include characterization, interim storage, and management of the contaminated soil and debris materials until the final remediation under Operable Unit 3.

February activities included continued Removal Action Work Plan preparation. Completion is expected in March 1992.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	March 25, 1992

RA No. 18, Control Exposed Material in Pit 5

The Control Exposed Material in Pit 5 Removal Action is being developed and implemented using a phased approach. This phased approach considers and utilizes information obtained from the liner repair activities, the pit berm investigation, which addresses the overall pit structural integrity, and the significance and magnitude of potential and actual emissions from the waste pit.

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RA No. 18, Control Exposed Material In Pit 5 (cont'd)

Activities in February included a presentation on the draft Work Plan to DOE-HQ and DOE-FO. A document version was later issued and reviewed. Direction was given to initiate the Sampling Analysis Plan to be inserted into the Work Plan document.

Activities in March will include a Work Plan review/comment resolution session with WEMCO, DOE-HQ, DOE-FO, and Parsons, followed by the submission of the final Work Plan to U.S. EPA and Ohio EPA.

KEY MILESTONES	STATUS	DUE DATE
Submit a Removal Action Work Plan to the U.S. EPA and the Ohio EPA	Open, on schedule	March 30, 1992

RA No. 19, Plant 7 Dismantling

The Plant 7 Dismantling Removal Action will include decontamination and dismantling of the Plant 7 structure. This dismantling will eliminate the potential threat of additional material releases and the safety hazard due to histoplasmosis. The activities in this removal action will include characterization, decontamination, removal, containerization, and disposal of the materials making up the above ground portion of the facility.

February activities included initiation of work for preparation of the Characterization Plan for the Removal Action. March activities will include initiation of project functional requirements.

KEY MILESTONES	STATUS	DUE DATE
Submit Work Plan to the U.S. EPA	Open, on schedule	April 20, 1993

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RA No. 20, Stabilization of UNH Inventories

The Stabilization of UNH Inventories Removal Action will remove and prepare for safe storage approximately 230,000 gallons of acidic UNH that is currently stored in 21 tanks in and around Plant 2/3. Existing processing equipment will be used to neutralize the solutions, filter the precipitate, and package the resulting filter cake in double containment for safe storage. This activity was previously part of Removal Action No. 12, Safe Shutdown, but is being accelerated as a separate expedited response.

February's activities included completion of the System Integrity Testing. As previously reported, System Integrity Testing was being conducted to verify the integrity of selected piping systems to be used during the UNH processing. A failure of the normal Plant 8 Sump operational equipment temporarily impacted the availability of existing filtration equipment required for processing the UNH. This condition was alleviated through maintenance to an existing unused filtration unit and the procurement of a refurbished unit to replace the damaged unit. Activities in February also included repair actions on the filtering system, which will continue into March.

KEY MILESTONES	STATUS	DUE DATE
System Integrity Testing	Completed	February 13, 1992
Submit Flow Charts to the U.S. EPA	Open	March 31, 1992
Commence Processing Material	Open	Schedule being developed
Finish Processing Material	Open	Schedule being developed

RA No. 21, Expedited Silo 3

On December 13, 1991, an Action Memorandum was issued to initiate an expedited removal action. The Silo 3 Removal Action mitigated the potential release of material to the environment and included the following actions:

- All obvious openings in the dust collector hopper were covered and sealed.
- The dust collector was removed.

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RA No. 21, Expedited Silo 3 (cont'd)

- All obvious pathways for release were capped or covered.

Implementation of the Removal Action was initiated on December 20, 1991. The material within the dust collector hopper exposed to the environment was stabilized on December 21, 1991. Loose equipment on the silo dome was removed.

KEY MILESTONES	STATUS	DUE DATE
Complete removal of the dust collector on Silo 3 dome	Completed January 8, 1992	January 15, 1992

Work in March will center on disposition of the equipment removed from Silo 3.

Proposed Phase III Removal Actions

RA No. 22, Waste Pit Area Containment Improvement

RA No. 23, Inactive Flyash Pile

RA No. 24, Pilot Plant Sump

RA No. 25, Nitric Acid Tank Car and Area

RA No. 26, Asbestos Removals (Asbestos Program)

RA No. 27, Management of Contaminated Structures at the FEMP

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1.0 Operable Unit 1

Operable Unit 1, as defined in the Amended Consent Agreement, includes the Waste Pits 1 - 6, Clearwell, Burn Pit, berms, liners and soil within the operable unit boundary.

1.1 Field Investigation

1.1.1 13-Well Program

Scope:

The 13 wells were installed into Waste Pits 1 - 4 and the Burn Pit. Waste samples were collected at various locations during boring operations and analyzed for Hazardous Substance List (HSL) parameters and characteristic radionuclides. Wells were developed and sampled to determine constituents of concern in the waste pit leachate.

Status:

All waste pit wells have been sampled per the approved work plan. Wells will be formally transferred to the FEMP Operating Contractor in order to collect water-level data and to facilitate future sampling requirements.

Laboratory analysis was completed on all Operable Unit 1 samples on February 12, 1992.

Issues/Corrective Actions:

None to report.

1.1.2 Radon Sampling Program

Scope:

The Radon Sampling Program was initiated in an effort to develop a representative measurement of radon releases from the waste pit area. The data will be used to support National Emission Standards for Hazardous Air Pollutants (NESHAP) compliance and Remedial Investigation/Feasibility Study (RI/FS) characterization requirements. The program consists of a one-time measurement of radon release using Large Area Activated Charcoal Collectors (LAACC). Approximately 100 LAACCs were placed on Waste Pits 1, 2, and 3. The LAACCs were left on the pits for 24 hours and then removed and analyzed. Continuous ambient air radon monitoring was also conducted during the period.

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1.1.2 Radon Sampling Program (cont'd)

Status:

The radon sampling is complete for Waste Pits 1, 2, and 3. The data is presently being evaluated and a report is expected by mid-March. Sampling will not be attempted on Pit 4, since it is covered by a synthetic cap. Pits 5 and 6 will not be sampled since it is a wet pit.

Issues:

Sampling of Pits 4, 5, and 6 have been deemed inadvisable since Pit 4 is covered by a synthetic cap and Pits 5 and 6 have standing water covering the waste materials. A revision/variance from the Sampling and Analysis Plan (SAP) is required.

Corrective Actions:

Request a variance to the work plan from the U.S. EPA as discussed in the February Project Manager's meeting.

1.1.3 Pits 5, 6 and the Clearwell Sampling Program

Scope:

The objectives of the Pits 5, 6, and Clearwell Sampling Program are to obtain sufficient quantities of samples for treatability studies and to provide additional RCRA characterization information on the waste pits. The pits will be sampled using one of the following methods as appropriate:

- a) slurry pump and backhoe
- b) clamshell and crane
- c) bailer
- d) Vibra-core sampler

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1.1.3 Pits 5, 6 and the Clearwell Sampling Program (cont'd)

Status:

The sampling of Pits 5, 6, and the Clearwell was scheduled to begin on December 16, 1991. The sampling was delayed due to the unavailability of a long-boom crane which is essential to the sampling effort. Samples were extracted from Pit 5 on January 29, 1992. These samples have been shipped to the treatability laboratory. Specimen preparation for stabilization testing has been initiated. The field crew and sampling equipment were relocated to Pit 6, where samples were obtained on February 20, 1992. The Clearwell sampling is projected to be completed in mid-March.

Issues:

The delay in collecting samples from Pits 5, 6, and the Clearwell will impact the May 26, 1992, completion date for preliminary analysis in that the treatability and characterization data for these pits may be available. All samples from Pits 5, 6, and the Clearwell will undergo the planned treatability testing as they are received in the laboratory. However, the characterization data for these pits may be available for inclusion in the first draft of the RI.

Corrective Action:

Efforts are underway to expedite sampling and to accelerate the treatability testing effort.

1.2 Treatability Studies

Scope:

The Operable Unit 1 treatability studies will evaluate the two treatment process options identified in the Operable Unit 1 Initial Screening of Alternatives document. The two treatment process options are cement stabilization and vitrification. The technical feasibility of these technologies will be evaluated by conducting a series of experiments on both composite waste samples and individual strata samples. Ranges of formulations will be investigated as will other performance criteria such as compressive strength, leachability, bulking factor and permeability. For cement stabilization, binding agents that will be evaluated include portland cement, fly ash, and sodium silicate. Clay (attapulgite and clinoptilolite) will be added to reduce the leachability of metals in the waste. Glass formers and modifiers being considered for vitrification are flyash, soil, and sodium hydroxide.

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1.2 Treatability Studies (Cont'd)

Status:

To date, Stage I molds for the cement stabilization studies have been made for Pits 1, 2, 3, 4, 5, and the Burn Pit. Unconfined compressive strength (UCS) tests have been performed and modified toxicity characteristic leaching procedures (MTCLPs) initiated for all pits except Pits 5, 6, and the Clearwell. Test specimens for Pit 5 have been prepared and are curing. A Pit 6 sample was collected on February 20, 1992, and will be shipped to the treatability lab in early March. Clearwell sampling remains to be performed. Toxicity Characteristics Leaching Procedure (TCLP) extraction results are being received periodically and evaluated.

Trial waste vitrification tests were completed using a waste surrogate to validate test procedures. The trial waste melts indicate that the glass would be more pourable if platinum crucibles were used instead of ceramic.

A conference call was held with the U.S. EPA and the Ohio EPA on January 27, 1992 to resolve open issues resulting from the Ohio EPA's comments. Tentative resolution has been reached and a response to these comments was submitted to the U.S. EPA and the Ohio EPA on February 5, 1992.

Issues:

The delay in collecting samples from Pits 5 and 6, and the Clearwell may delay completion of the preliminary analysis, which is currently scheduled for May 26, 1992.

Corrective Actions:

Expedite sampling of Pits 5, 6, and the Clearwell. Once samples are received, expedite the analyses of the samples to get back on schedule (May 26, 1992).

1.3 Remedial Investigation

Scope:

A RI Report will be prepared in accordance with the U.S. EPA Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA Directive 93553-01) and the Human Health Evaluation Manual (EPA/540/1-89/002).

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1.3 Remedial Investigation (cont'd)

Status:

The first activity scheduled for the RI is the field data analysis. The objective of this activity is to evaluate the preliminary data available from field measurements while awaiting results of lab analyses. The field data analysis was initiated on December 2, 1991, with the revision of the waste pit cross sections. With the new boring logs that were obtained from the recent 13-well field investigation, data is available for the depths of Waste Pits 1, 2, 3, 4, and the Burn Pit. Preliminary review of the data from the new borings indicate the projected depths of the waste pit bottoms are within three to six feet of their actual bottoms. The exception to this finding is the Burn Pit. Here, the actual bottom depth is approximately 10 feet deeper than originally projected. The cross sections will be completed the week of March 1, 1992.

Delays in the sampling of Pits 5, 6, and the Clearwell will delay receipt of the characterization data for these pits. As a result, preparation of the RI Report will begin before receipt of the data from these pits. However, the Pits 5, 6, and the Clearwell data should be available and incorporated before the draft report is submitted. This information is not considered essential for preparation of the baseline risk assessment, but instead is an outfall of the treatability study efforts.

Delays in completion of data validation and entry into the database are delaying evaluation of the RI data; however, no impact to the Consent Agreement delivery date for the RI is anticipated.

Corrective Action:

Proceed with preparation of the RI using characterization data from Pits 1, 2, 3, 4, and the Burn Pit. Incorporate Pits 5, 6, and the Clearwell data into the RI when it is available. There should be no impact to the Amended Consent Agreement schedule.

Additional staff have been assigned to assist in completion of data validation and entry into the database. Work is proceeding on nondata-related tasks such as field program descriptions and text editing.

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1.3 Remedial Investigation (cont'd)

OU 1 REMEDIAL INVESTIGATION REPORT

PRIMARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 1 study area. Estimates volume of contaminated media and materials.	06/15/93 C 10/14/92 F	8/11/93 C 12/14/92 F	10/12/93 C 02/11/93 F	12/11/93 C 04/13/93 F	01/10/94 C 05/11/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

- Initial stages are underway including model development and data analysis. Cross sections of the waste pits are being revised to incorporate data from the recent 13-boring program.

1.4 Planned Activities for March 1992

Complete data validation and 90% verification of database entry for the 13-well program.

Continue the first phase of treatability testing. Initiate the first phase of vitrification treatability testing.

Complete sampling of the Clearwell and initiate treatability testing for that unit.

Issue Radon Flux Report.

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2.0 Operable Unit 2

Operable Unit 2, as defined in the Amended Consent Agreement, includes the Flyash Piles, other South Field disposal areas, lime sludge ponds, solid waste landfill, berms, liners, and soil within the operable unit boundary.

2.1 Field Investigation

2.1.1 19-Boring/Well Program

Scope:

This program provides additional characterization of the individual waste units within Operable Unit 2. Borings are located in both Flyash Piles, the solid waste landfill and the South Field. If leachate is encountered during boring operations, wells will be installed and sampled. Sampling and characterization of standing water in the north lime sludge pond is also included in the program.

Status:

The analytical results from this program have been received, validated, and evaluated as to conformance to the work plan and data user requirements.

Issues:

After review of the Operable Unit 2 validation results, it was determined that additional sampling would be prudent. The additional samples required were due in part to not testing certain parameters for samples taken in the Active and Inactive Flyash piles, the solid waste landfill, and the South Field, or due to suspected matrix effects on several parameters. Various parameters were requested from these locations during the additional sampling, including TCLP volatile and semi-volatile organic compounds, HSL, Appendix IX, full radiological, total organic carbon, and simulated rainwater leaching procedure (SRLP).

Corrective Actions:

Additional radiological analyses will be performed on samples retrieved from archive storage.

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2.1.1 19-Boring/Well Program (cont'd)

A Work Plan addendum was written for extracting samples from the following locations:

- One hollow stem boring in the Active Flyash Pile
- Two hollow stem borings in the Inactive Flyash Pile
- One hollow stem boring in the solid waste landfill
- Four hand-auger borings in the South Field

The sampling began February 22, 1992, and was completed February 25, 1992. The samples were transmitted to the contract laboratory for analysis. The laboratory has committed to completing the sample analysis in April 1992. Copies of the field logs for this sampling activity are attached to this report.

2.1.2 Additional HSL Parameters Sampling Program

Scope:

This program provides for collection of samples from four shallow borings in the South Field. These samples are to be analyzed for HSL parameters to supplement the limited data available for this area.

Status:

All sample collection activities have been completed in prior months. Laboratory analyses for the additional sampling and subsequent HSL laboratory analysis have been completed.

Issues/Corrective Actions:

As part of the corrective actions given in Section 2.1.1, 19-Boring/Well Program, four additional samples were taken to complete the data set.

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2.1.3 Excavation of Trenches in the Solid Waste Landfill

Scope:

This program provides for the excavation of three trenches in the landfill. Excavation of trenches is needed to provide a visual observation and a definitive description of the intervals not recovered in Borings 1719, 1721, and 1722, which were drilled as part of the 19-Boring Program. If leachate/perched groundwater is encountered in the trenches it will be sampled for HSL, Appendix IX, selected radiological and general groundwater chemistry parameters.

Status:

A Work Plan Addendum has been prepared and is currently undergoing FEMP site review. The plan will be transmitted to the Ohio EPA and the U.S. EPA in early March 1992.

Issues/Corrective Actions:

None to report

2.2 Treatability Studies

Scope:

The purpose of this study is to provide additional information to support the FS and subsequent remedy selection for Operable Unit 2. Specifically, the study will demonstrate whether stabilization can achieve the desired level of material strength, as well as obtain quantitative data for geochemical modeling and subsequent computer modeling of groundwater contaminant transport. The study is composed of two parts: preliminary stages (to support remedy screening) and advanced stages (to support remedy selection). The preliminary stage involves evaluating a range of stabilization mix formulations in order to determine a representative formulation which meets the proposed strength criteria. The advanced stage involves performing tests on stabilized waste using representative formulations determined in the preliminary stage.

Status:

Permeability testing was initiated during February 1992. The Partial results have been received from advanced stage TCLP testing. All TCLP results and results from radiological analysis are expected by the end of March 1992.

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2.3 Remedial Investigation

The purpose of the RI is to provide a summary of the field investigations and to support the FS by defining the nature and extent of the contaminants in the Operable Unit study area; estimating the volume of contaminated media and materials; and providing a baseline risk assessment, which establishes remedial action objectives.

Status:

Work effort during the month included evaluation of the field data from the characterization program as well as the results of data validation. Revision of text, tables, and figures in the first three chapters of the RI are nearing completion. Efforts to incorporate the description of the affected environment as required by the integration of CERCLA and NEPA requirements are ongoing.

Issues:

Due to the delay in obtaining analytical results from the laboratory, the internal forecast completion date of the RI Report has slipped, although the Consent Agreement delivery date for the RI has not been impacted.

Corrective Action:

A schedule recovery plan has been prepared and implemented to reduce the slippage.

OU 2 REMEDIAL INVESTIGATION REPORT

PRIMARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants within the Operable Unit 2 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	06/22/92 C 05/11/92 F	8/19/92 C 07/08/92 F	10/19/92 C 09/04/92 F	12/18/92 C 11/04/92 F	01/17/93 C 12/02/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

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2.4 Feasibility Study

The characterization review and alternative assessment were initiated in February 1991.

OU 2 FEASIBILITY STUDY REPORT

PRIMARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Describes and analyzes potential remedial alternatives. A comparative analysis is performed for all alternatives.	11/16/92 C	01/15/93 C	03/15/93 C	05/14/93 C	06/13/93 C
	11/16/92 F	01/15/93 F	03/15/93 F	05/14/93 F	06/13/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

- Initial stages are underway including model development and data analysis.

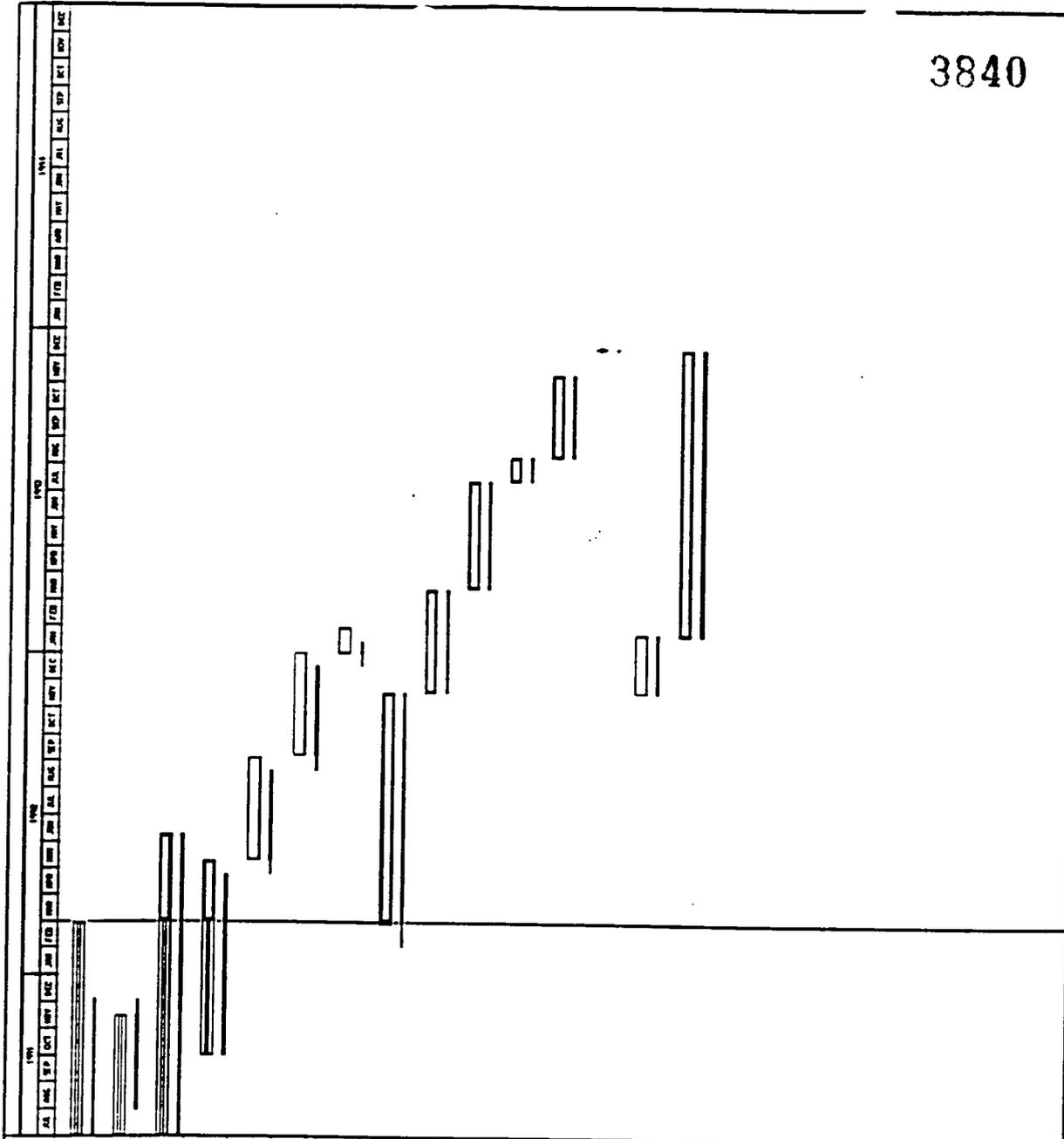
2.5 Planned Activities for March 1992

Obtain TCLP results from an advanced stage of the treatability study.

Continue preparation of the RI Report.

Continue characterization review and alternative assessment for the FS Report.

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U02 14 WELL PROGRAM AS 1MAR91 AF 28FEB92
U02 ADDITIONAL HSL SAMPLING PROGRAM AS 1JUL91 AF 15NOV91
U02 TREATABILITY STUDIES AS 1APR91 EF 8JUN92
U02 REMEDIAL INVESTIGATION REPORT PREPARATION AS 1OCT91 EF 8MAY92
DOE U02 RI REVIEW/REVISE/APPROVE ES 11MAY92 EF 3SEP92
EPA U02 RI REVIEW & APPROVE ES 7SEP92 EF 31DEC92
PRINT AND DISTRIBUTE FINAL U02 RI REPORT ES 1JAN93 EF 28JAN93
U02 FEASIBILITY STUDY/PROP PLAN PREP AS 28FEB92 EF 16NOV92
DOE U02 FS/PP REVIEW/REVISE/APPROVE ES 17NOV92 LF 12MAR93
EPA U02 FS/PP REVIEW/REVISE/APPROVE ES 15MAR93 EF 12JUL93
PRINT AND DISTRIBUTE FINAL U02 FS/PP ES 13JUL93 EF 9AUG93
U02 PUBLIC COMMENT ES 10AUG93 EF 10NOV93
SUBMIT U02 DRAFT ROD TO EPA EF 10DEC93
U02 DRAFT ROD PREPARATION ES 18NOV92 EF 22JAN93
DOE U02 DRAFT ROD REVIEW/REVISE/APPROVE ES 22JAN93 EF 10DEC93

Prepared by: 4517/TC	
Date	Revised

Sheet 1 of 1
Date Date: 10/29/92
Plot Date: 5/28/93

RI/FS PROGRAM
FERNALD ENVIRONMENTAL MGMT PROJECT
FEMP RI/FS U02 CONSENT AGMT TRACKING

Project Start: 10/1/90
Project Finish: 1/1/93

Activity Symbol: []
Critical Activity: []
Program for: []
Report Dates as of: 10/1/92
P-Innovative Systems, Inc. 100-100

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3.0 Operable Unit 3

Operable Unit 3, as defined in the Amended Consent Agreement, includes the Production Area and production associated facilities and equipment (includes all above- and below-grade improvements) including, but not limited to, all structures, equipment, utilities, drums, tanks, solid waste, waste product, thorium, effluent lines, K-65 transfer lines, wastewater treatment facilities, fire training facilities, scrap metal piles, feed stocks, and coal pile.

3.1 Initial Scoping/Work Plan Revisions

Initial scoping activities for Operable Unit 3 in February included a continuing analysis of the data collected during the previous months, and development of the first rough draft of the work plan addendum.

3.1.1 Review of Existing Data

The summary tables of existing available data were reviewed throughout the month. Minor editorial changes were made. This information was used to help identify unfulfilled data needs which will ultimately define the extent and scope of the field data collection program.

3.1.2 Development of Draft Sections of the Operable Unit 3 Work Plan Addendum

The first complete rough draft of the Work Plan Addendum was completed and distributed for internal review on February 14, 1992.

OU3 WORK PLAN ADDENDUM

WORK PLAN

SCOPE	SUBMIT TO DOE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
The work plan/appendices will include the necessary information to establish an initial evaluation of Operable Unit 3 (e.g., conceptual models, waste/contaminant quantities), define a work plan rationale (e.g., data requirements, SAP approach) and identify specific Operable Unit 3 RI/FS tasks (e.g., field investigation, treatability studies, Remedial Investigation/Baseline Risk Assessment Report).	04/03/92 C 04/03/92 F	06/02/92 C 06/02/92 F	07/02/92 C 07/02/92 F	08/03/92 C 08/03/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

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3.1.2 Development of Draft Sections of the Operable Unit 3 Work Plan Addendum (cont'd)

- Supporting activities such as data collection/analysis; identification of preliminary Remedial Action Objectives (RAO); Applicable or Relevant and Appropriate Requirements (ARAR) and Remedial Action Alternatives; and development of a preliminary Operable Unit 3 conceptual model are continuing.
- The Operable Unit 3 Work Plan Addendum rationale was presented to the U.S. EPA and the Ohio EPA on February 12, 1992.

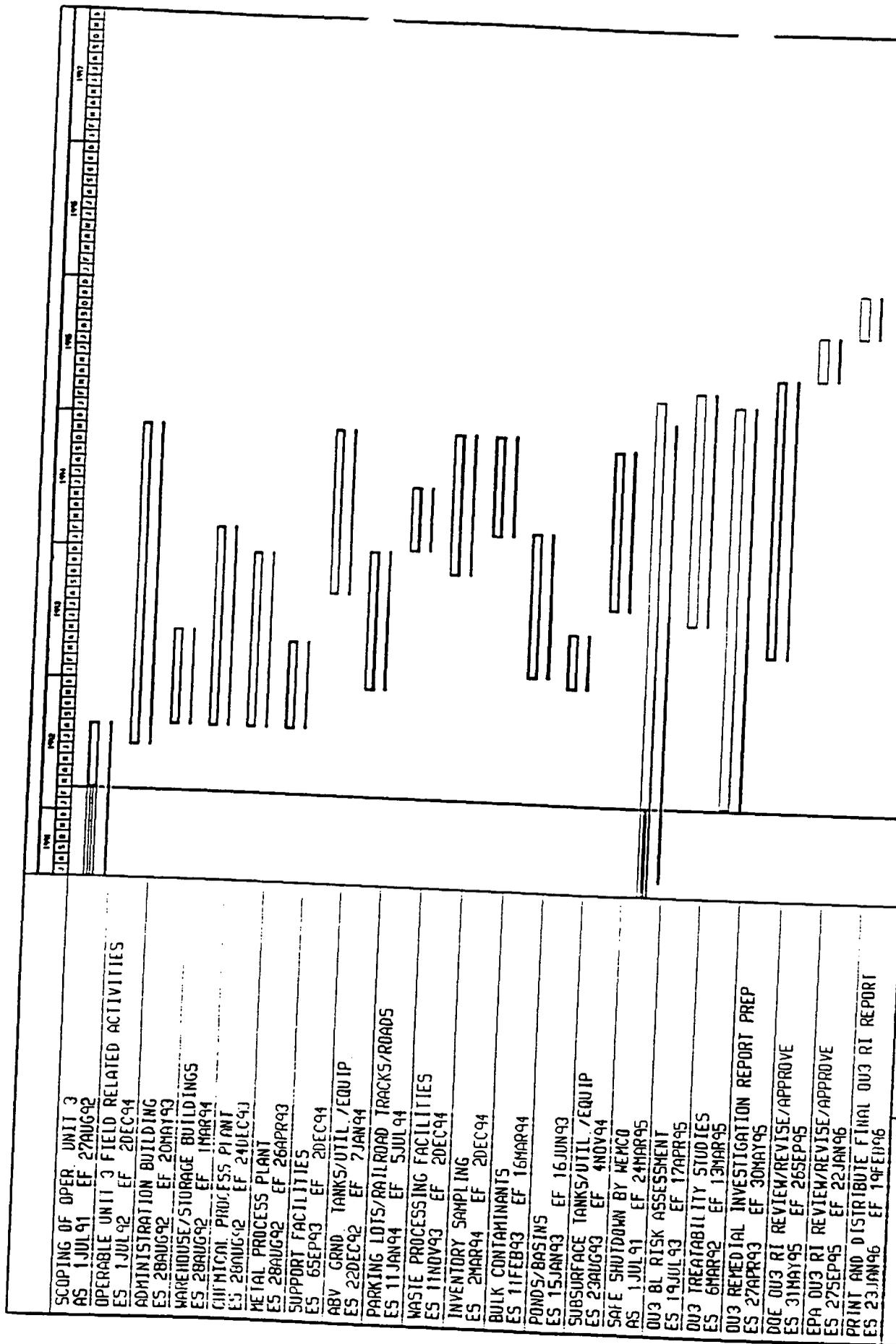
3.2 Issues/Corrective Actions

None to report

3.3 Planned Activities for March 1992

Complete second draft of the work plan and appendices.

Prepare the final draft of the Work Plan Addendum for DOE-HQ review and comment.



SCOPING OF OPER UNIT 3
 AS 1JUL91 EF 27AUG92
 OPERABLE UNIT 3 FIELD RELATED ACTIVITIES
 ES 1JUL92 EF 20DEC94
 ADMINISTRATION BUILDING
 ES 28AUG92 EF 20MAY93
 WAREHOUSE/STORAGE BUILDINGS
 ES 28AUG92 EF 1MAR94
 CHEMICAL PROCESS PLANT
 ES 28AUG92 EF 24DEC94
 METAL PROCESS PLANT
 ES 28AUG92 EF 26APR93
 SUPPORT FACILITIES
 ES 6SEP93 EF 20EC94
 ABV GRND. TANKS/UTIL /EQUIP
 ES 22DEC92 EF 7JAN94
 PARKING LOTS/RAILROAD TRACKS/ROADS
 ES 11JAN94 EF 5JUL94
 WASTE PROCESSING FACILITIES
 ES 11NOV93 EF 20DEC94
 INVENTORY SAMPLING
 ES 2MAR94 EF 20DEC94
 BULK CONTAMINANTS
 ES 11FEB93 EF 16MAR94
 PONDS/BASINS
 ES 15JAN93 EF 16JUN93
 SUBSURFACE TANKS/UTIL /EQUIP
 ES 23AUG93 EF 4NOV94
 SAFE SHUTDOWN BY MEMCO
 AS 1JUL91 EF 24MAR95
 OUG 8L RISK ASSESSMENT
 ES 19JUL93 EF 17APR95
 OUG TREATABILITY STUDIES
 ES 6MAR92 EF 13MAR95
 OUG 3 REMEDIAL INVESTIGATION REPORT PREP
 ES 27APR93 EF 30MAY95
 DOE OUG 3 RI REVIEW/REVISE/APPROVE
 ES 31MAY95 EF 26SEP95
 EPA OUG 3 RI REVIEW/REVISE/APPROVE
 ES 27SEP95 EF 22JAN96
 PRINT AND DISTRIBUTE FINAL OUG 3 RI REPORT
 ES 23JAN96 EF 14FEB96

Activity (with) bars
 Critical activity
 Program bar
 Legend Date as of 10/70

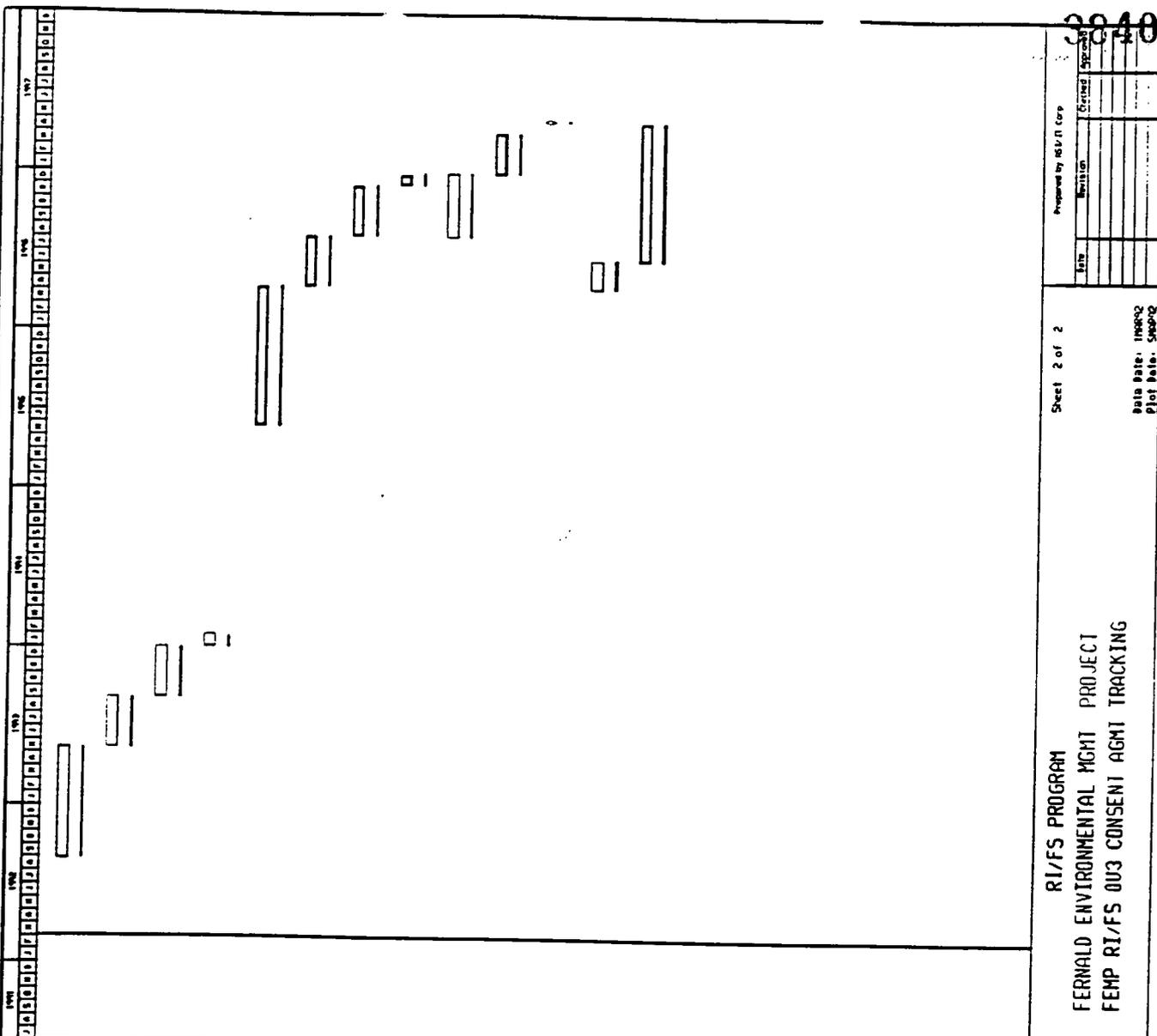
Project Start - 10/17/90
 Project Finish - 10/17/96

RI/FS PROGRAM
 FERNALD ENVIRONMENTAL MGMT PROJECT
 FEMP RI/FS OUG 3 CONSENTI AGMI TRACKING

Sheet 1 of 2
 Date Plot - 10/18/92
 Plot Title - S0802

Proposed by: MTR/PL Corp
 Date: _____
 Revision: _____
 Checked: _____
 Approved: _____

0U3 INITIAL SCREENING OF ALTERNATIVES RPT PREP
 ES 28AUG92 EF 12MAY93
 DOE 0U3 ISA REVIEW/REVISE/APPROVE
 ES 13MAY93 EF 7SEP93
 EPA 0U3 ISA REVIEW/REVISE/APPROVE
 ES 85EP93 EF 3JAN94
 PRINT AND DISTRIBUTE FINAL 0U3 ISA REPORT
 ES 4JAN94 EF 31JAN94
 0U3 FEASIBILITY STUDY/PROPOSED PLAN PREP
 ES 24MAY95 EF 10APR96
 DOE 0U3 FS/PP REVIEW/REVISE/APPROVE
 ES 11APR96 EF 5AUG96
 EPA 0U3 FS/PP REVIEW/REVISE/APPROVE
 ES 6AUG96 EF 29NOV96
 PRINT AND DISTRIBUTE FINAL 0U3 FS/PP
 ES 20DEC96 EF 27DEC96
 0U3 DRAFT NOTICE OF AVAILABILITY (NOA)
 ES 6AUG96 EF 30DEC96
 0U3 PUBLIC COMMENT PERIOD
 ES 30DEC96 EF 2APR97
 SUBMIT 0U3 DRAFT ROD TO EPA
 EF 1MAY97
 0U3 DRAFT ROD PREPARATION
 ES 11APR96 EF 17JUN96
 DOE 0U3 DRAFT ROD REVIEW/REVISE/APPROVE
 ES 17JUN96 EF 1MAY97



Activity Bar/Early Dates
 Political Activity
 Program for
 Target Dates as of 10/1/96

Project Start: 10/1/90
 Project Finish: 10/1/96

RI/FS PROGRAM
 FERNALD ENVIRONMENTAL MGMT PROJECT
 FEMP RI/FS 0U3 CONSENT AGMT TRACKING

Sheet 2 of 2
 Date: 10/1/96
 Plot Date: 10/1/96

3840

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

4.0 Operable Unit 4

Operable Unit 4, as defined in the Amended Consent Agreement, consists of Silos 1, 2, 3, and 4, the silo berms, the Decant Tank System, and soil within the operable unit boundary.

4.1 Field Investigation

4.1.1 Slant Borings

Scope:

Five slant or angled borings were advanced beneath Silos 1 and 2 and the decant sump tank.

Status:

All sampling activities and laboratory analysis of the samples have been completed. Data validation is nearing completion and evaluation of validation results will begin shortly.

4.1.2 Vertical Borings:

Scope:

Four vertical borings were advanced into the earthen berm of Silos 1 and 2 to identify contaminant transported from the silos in the area of the decant ports.

Status:

All sampling activities and laboratory analysis of the samples have been completed. Data validation is nearing completion. Evaluation of validation results will begin shortly.

4.1.3 Silos 1 and 2 Contents:

Scope:

Silos 1 and 2 contents were sampled from three of the four manways at each silo. The contract laboratory completed the analysis for the Silos 1 and 2 samples in January 1992.

Status:

All sampling activities and laboratory analyses of the samples have been completed. Data validation is nearing completion. Evaluation of validation results will begin shortly.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending February 29, 1992

4.1.3 Silos 1 and 2 Contents (cont'd):

Issues:

Electronic data transfer (EDT) from the laboratory is taking longer than scheduled. Manual comparison of EDT results with the certified analytical analysis results has shown a significant number of inconsistencies.

Corrective Actions:

A working group has been established in cooperation with the analytical laboratory to ensure timely resolution of data discrepancies.

4.2 Treatability Studies

Scope:

The purpose of a treatability study work plan is to provide additional information to support the FS and subsequent remedy selection for Operable Unit 4. There are two separate work plans/studies to support the Operable Unit 4 FS. One study considers cement stabilization of Silos 1, 2, and 3 material and chemical extraction, leachate stabilization, and leachate purification of Silos 1 and 2 material. The second study considers the vitrification of Silos 1, 2, and 3 material.

The Treatability Study Work Plan (for stabilization and chemical extraction) will demonstrate whether cement stabilization can achieve a desired level of material strength, provide information to help determine the effectiveness of chemical extraction, and provide data for use in fate and transport modeling. The study is composed of a preliminary phase and an advanced phase. The preliminary phase will determine the potential reagents and conditions for stabilization and/or extraction on composites of the silo material. The advanced phase will evaluate the material variability by testing formulations and/or extraction on the top, middle, and bottom layers from each silo.

The Treatability Study Work Plan for the Vitrification of Residues from Silos 1, 2, and 3 considers vitrification of silo material, radon emanation rate from the vitrified waste, and the leachability of the vitrified waste. The study is composed of two major phases. These are the laboratory screening of the residues and the benchscale vitrification testing.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

4.2 Treatability Studies (cont'd)

Status:

The revised Treatability Study Work Plan and response to the comments document for cementation and chemical extraction was transmitted to the U.S. EPA and the Ohio EPA for receipt on January 3, 1992. Both the U.S. EPA and the Ohio EPA have approved the Treatability Study Work Plan.

Stabilization testing supporting the Treatability Study continued in February. Silo 3 - Preliminary Phase Stage II - 12 specimens completed the 28-day curing stage. UCS tests were conducted (during January) with preliminary results ranging from 110-900 psi (the majority were over 500 psi). Extractions for MTCLP were completed during February. Preliminary Phase Stage III - six specimens were poured and are in the 28-day curing stage. Silos 1 and 2 - Preliminary Phase Stage II - 30 specimens (15 per silo) completed the 28-day curing stage (during January) and UCS and MTCLP tests have been completed.

Acid leaching (chemical extraction) tests - Preliminary Phase Stage II, as defined in the Treatability Study Work Plan, were initiated in February.

Development of a treatability sample tracking/test results database is in progress.

A revised Treatability Study Work Plan for the Vitrification of Residues from Silos 1, 2, and 3 was delivered to the U.S. EPA and the Ohio EPA on January 29, 1992. Formal comments have been received from the Ohio EPA and a draft disapproval, with comments, has been received from the U.S. EPA.

4.3 Remedial Investigation Report

Scope:

The purpose of the RI is to provide a summary of the field investigations and to support the FS by defining the nature and extent of the contaminants in the Operable Unit 4 study area; estimating the volume of contaminated media and materials; and providing a baseline risk assessment, which establishes remedial action objectives.

Status:

Operable Unit 4 RI activities in February included gathering and reviewing available field and analytical data; starting revisions to the previous draft of the RI Report; and continuing model revisions for the risk assessment.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

4.3 Remedial Investigation Report (cont'd)

Issues:

Due to the nonavailability of validated field and analytical data, RI activities have slipped three weeks.

Corrective Action:

A recovery plan has been formulated and will be initiated pending Change Control Board (CCB) approval.

OU4 REMEDIAL INVESTIGATION REPORT

PRIMARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE/HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Details the nature and extent of contaminants in the Operable Unit 4 study area. Estimates the volume of contaminated media and materials. Provides a baseline risk assessment and establishes remedial action objectives.	12/21/92 C 10/15/92 F	02/17/93 C 12/14/92 F	04/19/93 C 02/11/93 F	06/18/93 C 04/13/93 F	07/18/93 C 05/11/93 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

4.4 Planned Activities for March 1992

Continue revisions to the RI Report/Baseline Risk Assessment.

Review and analyze data validation to determine if Operable Unit 4 has been fully characterized.

Initiate Treatability Stabilization Testing for Preliminary Phase - Stage III.

Complete Treatability Chemical Extraction Testing for Preliminary Phase - Stage II and initiate Advanced Phase Study.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

5.0 Operable Unit 5

Operable Unit 5, as defined in the Amended Consent Agreement, includes groundwater (including site-wide perched groundwater), surface water, soil not included in the definitions of Operable Units 1-4, sediments, flora, and fauna.

5.1 Field Investigation

5.1.1 Paddy's Run South

Scope:

This investigation consists of the installation of twelve 2000-series wells along Paddy's Run, south of the FEMP, with the contingency to install twelve 3000-series wells, sample wells monthly for one year, perform stream gage and stream infiltration measurements, and perform surface water sampling.

Status:

Groundwater sampling of all monitoring wells within the Paddy's Run South investigation was completed for the month of February. Two surface water samples were taken along Paddy's Run. February was the last month remaining for the monthly groundwater sampling program. The program will be transferred from the RI/FS contractor to the FEMP Site Operating Contractor's Environmental Monitoring program in March to become part of the facility environmental monitoring program.

Issues/Corrective Actions:

None to report

5.1.2 Facilities Testing

Scope:

This investigation consists of systematic and focused borings within the FEMP production area and additional suspect areas. Piezometers are installed in borings where water was encountered and sampled.

Status:

Sampling of the remaining six wells was completed. Final analysis results from the contract laboratory are forthcoming.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

5.1.2 Facilities Testing (cont'd)

Issues/Corrective Actions:

None to report

5.1.3 31-Well Program

Scope:

This investigation consists of defining the limits of uranium plumes in the southern area of the FEMP.

Status:

Completed the second and final round of groundwater sampling at Well 2395. The well will now be transferred to the FEMP Site Operating Contractor.

Issues/Corrective Actions:

None to report

5.1.4 8-RCRA Well Program

Scope:

Eight wells were installed to meet RCRA and RI/FS requirements in and around the FEMP waste storage area.

Status:

Well 1646 was developed and the initial round of groundwater sampling was completed. The second round of groundwater sampling is scheduled to take place in March 1992.

Issues/Corrective Actions:

None to report

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

5.1.5 Miscellaneous Additional Wells Program

Scope:

Additional wells are being installed to fill in data gaps defined through recent sampling activities.

Status:

A revised work plan incorporating the final comment resolution will be prepared and submitted, once approval of the responses is received.

Installation of wells under this program is continuing.

The following wells have been installed and/or developed and sampled (total dissolved uranium concentrations are shown where available):

- Well 2421 - Installation complete. Developed and sampled first round of groundwater.
- Well 2398 - Installation complete. Completed first and second rounds of groundwater sampling. Analytical results from the onsite laboratory indicate a total dissolved uranium concentration of 3.7 ug/L in the initial sample.
- Well 2399 - Installation complete. Developed and sampled first round of groundwater. Analytical results from the onsite laboratory indicate a total dissolved uranium concentration of 2.4 ug/L in the initial sample.
- Well 3421 - Installation complete. Developed and sampled first round of groundwater.
- Well 2171 - Installation complete.
- Well 2420 - Installation complete. Developed and sampled first round of groundwater. Analytical results from the onsite laboratory indicate a total dissolved uranium concentration of 9.7 ug/L in the initial sample.
- Well 2400 - Installation complete. Developed and sampled first round of groundwater. Analytical results from the onsite laboratory indicate a total dissolved uranium concentration of 1.6 ug/L in the initial sample.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
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Period Ending February 29, 1992

5.1.5 Miscellaneous Additional Wells Program (cont'd)

- Well 2402 - Installation complete. Developed and sampled first round of groundwater. Analytical results from the onsite laboratory indicate a total dissolved uranium concentration of 27 ug/L in the initial sample. Contingency Well 3402 has been added to the scope of this task as a result of the uranium concentration in Well 2402.
- Well 2679 - Installation complete. Developed and sampled first round of groundwater.
- Well 3679 - Installation complete.
- Well 3678 - Installation complete.
- Well 2423 - Installation started.
- Well 3423 - Installation complete.

Issues/Corrective Actions:

None to report

5.1.6 Auger and Cable Sampling Program

Scope:

Soil and perched groundwater sampling will occur in the following areas under this program: the Plant 1 Pad, the Southeast Quadrant of the Production Area, the Fire Training Area, the KC-2 Warehouse Area, Scrap Metal Area and Electrical Substation, and the K-65 Slurry Line and Clearwell Line.

Status:

Final site comment resolution has been nearing completion. It is expected that the addendum will be transmitted to the U.S. EPA and the Ohio EPA in April.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
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Period Ending February 29, 1992

5.1.6 Auger and Cable Sampling Program (cont'd)

Corrective Actions:

Priority should be given to finalizing the review and approval of this document to expedite submittal to the U.S. EPA and the Ohio EPA.

5.2 Treatability Studies

Scope:

The purpose of this study is to provide information to support the Feasibility Study and subsequent remedy selection for Operable Unit 5. Specifically, the study will demonstrate the feasibility of soil washing as a remedial technology for cleaning soils in Operable Unit 5. The study incorporates a physical/chemical treatment process that initially involves the separation of a soil into different particle-size fractions. Reagent formulations in the washing solutions are used in the extraction of radionuclides, organic, and inorganic compounds from these different-size fractions. The contaminants may be separated from the wash stream into a concentrated residue for further treatment.

Status:

Preparation of responses to the comments received on the draft Operable Unit 5 Treatability Study Work Plan from the U.S. EPA and the Ohio EPA on January 15, 1992, continued in February. On February 14, 1992, a written notice of extension for responding to these comments was submitted to U.S. EPA, providing for a 20-day extension per the Amended Consent Agreement. The Consent Agreement schedule will not be impacted as a result of this extension.

OU5 TREATABILITY STUDY WORK PLAN

WORK PLAN

SCOPE	SUBMIT TO DOE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides scope of treatability studies for Operable Unit 5 soil treatment technologies including lab procedures and test evaluation criteria.	02/19/92 C 09/04/91 A	04/16/92 C 12/10/91 A	05/18/92 C 01/15/92 A	06/05/92 C 03/04/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

5.2 Treatability Studies (cont'd)

- Work plan preparation and review are proceeding ahead of the Consent Agreement schedule.

5.3 Initial Screening of Alternatives

Scope:

The initial Screening of Alternatives Report will document the initial activities of the FS. These activities include the following:

- Develop remedial action objectives
- Develop general response actions
- Identify volumes or areas of media to which response actions might be applied
- Identify and screen technologies
- Identify and evaluate technology process options
- Assemble selected representative process options into alternatives
- Perform an initial screening of the alternatives

Status:

A draft Initial Screening of Alternatives document was prepared and submitted to the DOE-FO on January 22, 1992. Review of this document proceeded during the month of February.

OU5 INITIAL SCREENING OF ALTERNATIVES

PRIMARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE/HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides for initial evaluation against pre-selected criteria of candidate technologies assembled to remediate Operable Unit 5.	12/19/92 C 01/22/92 A	02/16/93 C 07/28/92 F	04/16/93 C 09/04/92 F	06/15/93 C 11/03/92 F	07/15/93 C 12/03/92 F

C = Consent Agreement Date

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**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
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Period Ending February 29, 1992

5.3 Initial Screening of Alternatives (cont'd)

Issues/Corrective Actions:

None to report.

5.4 Planned Activities for March 1992

Submittal of RI/FS Work Plan Addendum for Operable Unit 5 to DOE-HQ for review and approval.

Submittal of response to comments and the revised draft final Treatability Study Work Plan to the U.S. EPA and the Ohio EPA on March 4, 1992.

Receipt of comments from the DOE-FO on the Initial Screening of Alternatives document and subsequent revision of the document based on these comments.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

6.0 Engineered Waste Management Facility

This program will evaluate the ability of the Engineered Waste Management Facility (EWMF) to manage the remedial waste generated by the operable units.

6.1 Sampling and Analysis Plan

Scope:

The U.S. EPA approved EWMF SAP as an addendum to the RI/FS Work Plan (March 1988) and specifies a series of soil sample collection and analytical activities. Geotechnical, geochemical, radiological, and chemical soil samples will be collected for analysis from 18 geotechnical borings (each approximately 30 feet deep), and eight wells (five 1000-series and three 2000-series) to be installed under this program.

All surface soil samples will receive full radiological and full HSL analysis while, in general, samples collected at mid-stratum of the glacial overburden will receive total uranium and gamma spectral analysis only. The geochemical samples selected for batch sorption tests, x-ray diffraction analysis, and polarized light microscopy will be used to calculate retardation coefficients for an EWMF groundwater fate and transport model. The balance of the collected soil samples will receive geotechnical testing for preliminary engineering purposes. In addition, an on- and off-property NEPA ecological characterization program will be conducted with biota sampling performed on trees at nine on-property locations.

The resultant SAP field and laboratory data will be used to support the evaluation of criteria for a detailed analysis of the EWMF as an on-property waste disposal/storage alternative per the methodology given in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (EPA 1988).

Status:

The original field effort has now been completed. During implementation, a number of geotechnical borings encountered perched groundwater. In addition, one well set (one-1000-series, one-2000 series) encountered bedrock. Due to these developments, arrangements have been made to install five additional geotechnical borings and to relocate the well pair.

Issues/Corrective Actions:

None to report.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

6.1 Sampling and Analysis Plan (cont'd)

EWMF SAMPLING AND ANALYSIS PLAN

WORK PLAN

SCOPE	SUBMIT TO DOE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
The EWMF SAP is an addendum to the RI/FS Work Plan (March 1988) and specifies a series of soil sample collection and analytical activities. The resultant SAP field and laboratory data will be used to support the evaluation of criteria for a detailed analysis of the EWMF as an on-property waste disposal/storage alternative per the methodology given in "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (EPA 1988).	05/06/91 A	09/10/91 A	10/17/91 A	11/18/91 A

C = Consent Agreement Date

F = Forecast Complete

A = Actual

6.2 EWMF General Siting Report

Scope:

The report will establish the feasibility of locating on an EWMF at the FEMP.

Status:

The EWMF ARARs Revision 3 were submitted to the DOE for EPA review on December 3, 1991. Comments were received from the Ohio EPA on January 6, 1992 and the U.S. EPA on January 30, 1992. The ARARs were revised and resubmitted to DOE on February 24, 1992 for transmittal to the EPAs.

Issues/Corrective Actions

None to report

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

6.3 Planned Activities for March 1992

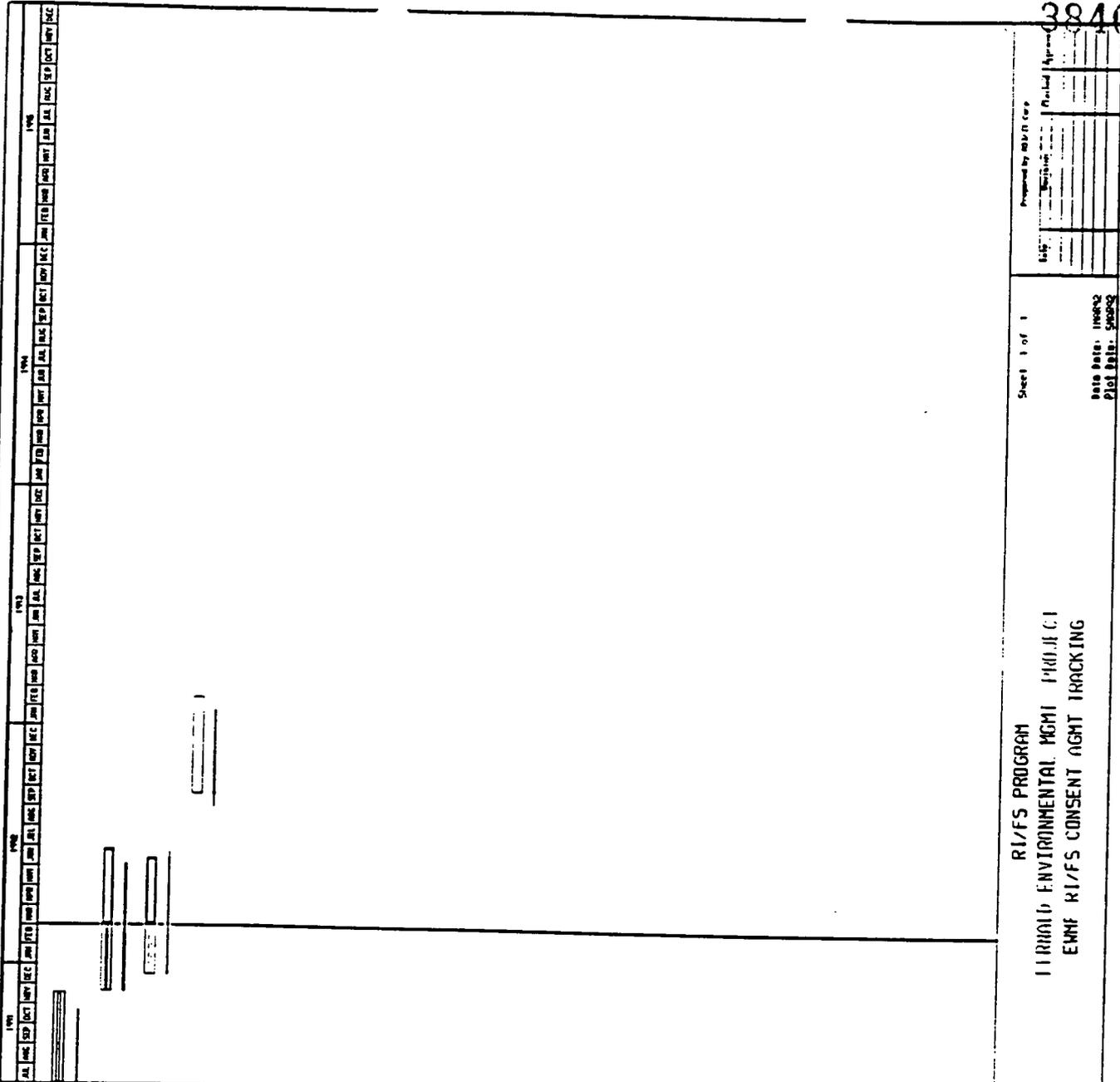
The five geotechnical borings and two well installations will be initiated in March.

As of March 2, 1992, geotechnical analysis of the EWMF soil samples will begin.

Expedite transmittal of ARARs to the U.S. EPA and the Ohio EPA.

Issue responses to the Ohio EPA's comments on the EWMF SAP, Final, Revision 1.

EWHF SAMPLING AND ANALYSIS PLAN PREP
 AS 18MAR91 EF 18NOV91
 EWHF FIELD INVESTIGATION
 AS 21NOV91 EF 26JUN92
 EWHF MATERIALS SOURCE SURVEY
 AS 17DEC91 EF 12JUN92
 EWHF GENERAL SITTING REPORT PREPARATION
 ES 21SEP92 EF 15FEB93



Activity Boundary Value
 Critical Activity
 Proposed Bar
 Legend Below on of 18179

Prepared by: M.B.N. Corp.
 Date: 10/19/92
 Project # 10010

R.I.F.S. PROGRAM
 HAROLD ENVIRONMENTAL MCMH PROJECT
 EWHF R.I.F.S. CONSENT AGMT TRACKING

Sheet 1 of 1
 Date Plot: 10/19/92
 Plot Size: 36x48

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
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PROGRESS REPORT**

Period Ending February 29, 1992

7.0 Site-Wide Characterization Report

7.1 Risk Assessment Work Plan Addendum

Scope:

The Risk Assessment Work Plan Addendum provides a detailed scheme for development and completion of a baseline risk assessment for each operable unit, a preliminary baseline risk assessment, and a remedial action risk evaluation with each operable unit feasibility study (FS).

The Risk Assessment Work Plan Addendum presents the specific risk assessment methodology to be followed in the RI/FS risk assessment task. It also establishes the scope of risk assessment work and documents the specific approach to be followed for determining whether estimated risks associated with selected remedial alternatives for the entire site are protective of human health and the environment. The addendum provides the methods, models, and parameters for development of the baseline risk assessment for each operable unit, the preliminary baseline risk assessment of the Site-Wide Characterization Report (SWCR), the remedial action risk evaluation, and the comprehensive action risk evaluation for each operable unit FS.

Status:

The draft final Risk Assessment Work Plan Addendum was submitted to the U.S. EPA on February 4, 1992.

The revised Addendum fulfills the requirements of the Amended Consent Agreement and presents the detailed methodology for performing risk assessment/risk management tasks in the RI/FS to resolve issues raised by the U.S. EPA and the Ohio EPA. The Response to Comments document presents detailed responses and actions for each of the 298 comments received from the U.S. EPA and the Ohio EPA.

Issues/Corrective Actions:

None to report.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
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7.1 Risk Assessment Work Plan Addendum (cont'd)

RISK ASSESSMENT WORK PLAN ADDENDUM

WORK PLAN

SCOPE	SUBMIT TO DOE	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides a detailed scheme for development and completion of the Baseline Risk Assessments and general approach for the Site-Wide Projected Residual Risk Assessment.	08/14/91 C 07/29/91 A	10/15/91 C 10/10/91 A	11/11/91 C 12/4/91 A	12/11/91 C 2/4/92 A

C = Consent Agreement Date

F = Forecast Complete

A = Actual

7.2 SWCR Report Preparation

Scope:

The SWCR is a one-time summary of all FEMP site data available as of December 1, 1991. It will contain the preliminary baseline risk assessment, which will estimate human health and ecological risk of the FEMP from a site-wide perspective. The SWCR will also provide the initial list of leading remedial alternatives for each operable unit for input into the FS cumulative response action risk evaluation.

Status:

Revision and preparation of Chapters 1, 2, and 3 of the SWCR are continuing. Data compilation continued in support of Chapter 4 and the preliminary baseline risk assessment. Preliminary efforts began on selection of the leading remedial alternatives.

One of the major issues raised at the January 16 meeting with the U.S. EPA, the Ohio EPA, and the DOE was the level of detail to be provided in ecological assessments for the FEMP. This issue will be partially addressed in the Risk Assessment Work Plan Addendum, but will also require further discussion among the DOE, the U.S. EPA, and the Ohio EPA.

Preliminary Baseline Risk Assessment

Status:

The preliminary baseline risk assessment is underway with identification of constituents of potential concern of potential site-wide reasonable maximum exposure individuals and locations, preliminary identification of scenarios for potential future releases from the FEMP, and development of site-wide models for exposure assessment calculations. Data is being compiled and used in preliminary calculations. Preliminary drafts of Chapters 5, 6, and 8 were prepared for internal review.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
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Period Ending February 29, 1992

7.2 SWCR Report Preparation (cont'd)

SITE-WIDE CHARACTERIZATION REPORT

SECONDARY

SCOPE	SUBMIT TO DOE	SUBMIT TO DOE/HQ	SUBMIT TO EPA	RECEIVE FROM EPA	SUBMIT TO EPA FINAL
Provides a one-time summary of site characterization data available as of 12/1/91, the Preliminary Baseline Risk Assessment and list of the leading remedial alternatives.	04/09/92 C	06/08/92 C	08/05/92 C	10/04/92 C	11/03/92 C
	04/13/92 F	06/10/92 F	08/07/92 F	09/02/92 F	10/06/92 F

C = Consent Agreement Date

F = Forecast Complete

A = Actual

Issues:

Any potential delay in delivery of the SWCR due to late U.S. EPA comments on the Risk Assessment Work Plan Addendum has not been determined.

The U.S. EPA and the Ohio EPA have expressed concerns about the level of detail to be provided in ecological assessments for the FEMP. Potential schedule impacts are unclear at this time, but requirements for additional detail and/or field studies could affect delivery of the SWCR or subsequent RI Reports.

Corrective Actions:

Notify U.S. EPA of potential delay.

Prepare briefing on ecological studies at the FEMP for the U.S. EPA and the Ohio EPA to resolve ecological assessment issues.

7.3 Planned Activities for March 1992

Continue data compilation in support of modeling and data summaries.

Prepare briefing on ecological assessment at the FEMP for the U.S. EPA and the Ohio EPA.

Complete internal drafts of Part I (the data summary) and Part III (the selection of leading remedial alternatives) of the SWCR.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

8.0 Community Relations

8.1 Status

The following removal action addenda to the Community Relations Plan -- Remedial Investigation/Feasibility Study and Removal Actions -- Volume III of the Work Plan are ready for submittal to U.S. EPA for approval:

Removal Action No. 1 - Contaminated Water Beneath FEMP Buildings - DCR #75

Removal Action No. 7 - Plant 1 Pad Continuing Release - DCR #76

Removal Action No. 9 - Removal of Waste Inventories and Thorium Management -
DCR #77

Removal Action No. 12 - Safe Shutdown - DCR #78

Removal Action No. 10 - Active Fly Ash Pile Controls - DCR #79

All comments/edits for the revision of the Community Relations Plan -- Remedial Investigation/Feasibility Study and Removal Actions -- Volume III of the Work Plan (August 1990), have been incorporated. After completing the review cycle and assigning it a Document Change Request number, the plan will be submitted to the U.S. EPA for approval. This revision/update of the CRP was undertaken without conducting any community assessment interviews.

The first DOE Community Meeting of the year was held February 25, 1992, at the Plantation in Harrison, Ohio. The exhibit opened at 6:00 p.m. and the actual meeting started at 7:00 p.m. Approximately 50 members of the community attended in addition to 50-75 from the various agencies associated with the FEMP. Robert Tiller, Fernald Manager, opened the meeting and introduced the other two panelists: Gerald Westerbeck, who presented the DOE-FO overview, and Jack Craig, who gave the status on the operable units and removal actions. Mr. Tiller also announced that the DOE Public Information Officer, Teresa Kwiatkowski, was relocating. Until her replacement arrives, all inquires should be directed to Mr. Westerbeck. Statements were made by the U.S. EPA, the Ohio EPA, and Fernald Residents for Environment, Safety and Health (FRESH).

8.2 Issues:/Corrective Actions:

None to report

8.3 Planned Activities for March 1992

The Paddy's Run Road Site Public Meeting will be held March 31, 1992, beginning at 7:00 p.m., at the Ross High School in Ross, Ohio.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

PERIOD ENDING FEBRUARY 29, 1992

ENCLOSURE A

**WASTEWATER FLOWS AND RADIONUCLIDE
CONCENTRATIONS UNDER CA SECTION XXIII.B**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Introduction

The accompanying Effluent Radiation Reports provide, in accordance with the requirements of Section XXIII.B of the Consent Agreement As Amended under CERCLA Sections 120 and 106 (a), data on the daily wastewater flows, radionuclide concentrations, and loadings released to the Great Miami River and an estimate of runoff and radionuclide concentrations to Paddy's Run during February 1992.

Summary - February 1992

The total quantity of uranium discharged from the FEMP to the Great Miami River via Manhole 175 (Outfall 11000004001) was 41.51 kilograms. The average uranium concentration for the previous 12 months was 0.58 mg/l. This is 65.2 percent of the Derived Concentration Guide (DOE Order 5400.5) for dischargeable offsite water.

There was no discharge from the Stormwater Retention Basin (Outfall 11000004002) to Paddy's Run via the Storm Sewer Outfall Ditch in February 1992. Based on 0.60 inches of rainfall in February 1992, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 2.70 kilograms.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Wastewater Flows and Radionuclide Concentrations

Facility: Fermat Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398705
Cincinnati, Ohio 45239-8705

Location: 11000004001 Month: February 1992
001 Total Discharge
Manhole 175 (Effluent to the Great Miami River)

<u>Day</u>	<u>Flow MGD</u>	<u>Total Alpha pCi/l</u>	<u>Total Beta pCi/l</u>	<u>Total U (mg/l)</u>	<u>Total U (kgs)</u>	<u>Calculated Total U-238 pCi/l (1)</u>
1	0.297	527	410	0.98	1.10	331
2	0.309	455	248	0.74	0.87	250
3	0.495	374	225	0.64	1.20	216
4	0.491	563	266	0.82	1.52	277
5	0.417	527	333	0.96	1.51	324
6	0.435	590	212	0.84	1.38	284
7	0.351	572	239	1.02	1.35	345
8	0.319	851	432	1.62	1.95	547
9	0.360	910	351	1.38	1.88	466
10	0.422	608	396	0.96	1.53	324
11	0.437	518	329	0.84	1.39	284
12	0.882	320	113	0.58	1.94	196
13	0.926	302	176	0.52	1.82	176
14	0.425	446	315	0.82	1.32	277
15	0.399	486	369	0.82	1.24	277
16	0.386	595	315	1.04	1.52	351
17	0.327	649	194	0.96	1.19	324
18	0.531	523	230	0.92	1.85	311
19	0.431	541	230	0.82	1.34	277
20	0.452	640	306	1.18	2.02	399
21	0.453	405	221	0.74	1.27	250
22	0.383	559	234	0.72	1.04	243
23	0.358	396	230	0.82	1.11	277
24	1.067	365	131	0.42	1.70	142
25	0.965	374	167	0.44	1.61	149
26	0.526	523	185	0.66	1.31	233
27	0.497	459	225	0.72	1.35	243
28	0.424	477	257	0.68	1.09	230
29	0.445	401	131	0.66	1.11	223
TOTAL	4.210				41.51	

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Wastewater Flows and Radionuclide Concentrations

Facility: Fernald Environmental Management Project

Location: 001 Total Discharge

Month: January 1992

	Flow (MGD)	Total Alpha (pCi/l)(2)	Total Beta (pCi/l)(2)	Total U (mg/l)(2)	Total U (kgs)	Calculated Total U-238 (pCi/l)(1)(2)
Avg.	0.490	484	237	0.77	1.43	261
Max.	1.067	910	432	1.62	2.02	547
Min.	0.297	302	113	0.42	0.87	142

The average uranium concentration for the previous twelve months was 0.58 mg/l. This is 65.2 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

- Comments: (1) The activity of this discharge has been and will continue to be reported as Uranium-238 (pCi/l) in accordance with the Ohio EPA format for reporting uranium. Since this does not account for the activity of the other uranium isotopes in the effluent, the total uranium data is also presented. The calculated total U-238 is based on a conversion factor of 337.84 pCi U-238/mg Total U applied to measure value of total uranium.
- (2) Average values presented are flow-weighted.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Wastewater Flows and Radionuclide Concentrations

Facility: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398705
Cincinnati, Ohio 45239-8705

Location: 11000004002
002 Discharge (Overflow) to Storm Sewer Outfall Ditch
Stormwater Retention Basin Spillway (Effluent to Paddy's Run)

Month: February 1992

There was no discharge to Paddy's Run from the Stormwater Retention Basin.

Based on 0.60 inches of rainfall for the month, the uranium discharge to Paddy's Run from uncontrolled areas of the FEMP is estimated to be 2.70 kgs.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE
AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

PERIOD ENDING FEBRUARY 29, 1992

ENCLOSURE B

FFCA: INITIAL REMEDIAL MEASURES

AND OTHER OPEN ACTIONS

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

INTRODUCTION

Enclosure B describes actions undertaken at the FEMP during the period February 1 through February 29, 1992 that are not covered by the reporting requirements of the Consent Agreement As Amended under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sections 120 and 106(a).

WORK ASSIGNMENTS AND PROGRESS

Descriptions of ongoing work progress are presented in the following sections of this report. The status of ongoing work in support of the Federal Facility Compliance Agreement (FFCA) is summarized in Table 1 of Enclosure B. Completed work previously reported upon has been eliminated for the sake of brevity. In this portion of the report and in Table 1, descriptions of actions are presented in a format consistent with that of the FFCA.

**COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND
LIABILITY ACT (CERCLA)**

1. Initial Remedial Measures

Section C

K-65 Silo Project - Status information on the K-65 Silo project normally reported in this section is being provided under Operable Unit 4: Silos 1-4.

2. Remedial Investigation/Feasibility Study (RI/FS)

Status information on the Remedial Investigation/Feasibility Study (RI/FS) normally reported in this section is being provided separately in accordance with the requirements of Section X of the Consent Agreement As Amended under CERCLA Sections 120 and 106(a).

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

**COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND
LIABILITY ACT (CERCLA)**

3. Reports and Record Keeping

Section B

The RI/FS Monthly Technical Progress Report for January 1992 was transmitted to the U.S. EPA on February 20, 1992 as an integral part of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report in accordance with the requirements of Section X of the Consent Agreement As Amended.

CLEAN AIR ACT (CAA)

Section E

The twenty-first Quarterly Particulate Emissions Report for the period October 1, 1991 through December 31, 1991 was submitted to the U.S. EPA on February 20, 1992.

RADIATION DISCHARGE INFORMATION

Section A

The twenty-first Quarterly Liquid Discharge Report for the period October through December 1991 was submitted to the U.S. EPA on February 20, 1992.

REPORTING REQUIREMENTS

Section B

The Federal Facility Compliance Agreement Monthly Progress Report for January 31, 1992, was transmitted to the U.S. EPA on February 20, 1992 as Enclosure B of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report.

TABLE 1

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**STATUS OF ACTIONS AS OF
FEBRUARY 29, 1992**

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY92 STATUS</u>
CERCLA			
1.	INITIAL REMEDIAL MEASURES		
1.C	Implement radon control plan approved by the U.S. EPA.	-----	No longer applicable. Progress on actions to address radon emissions from the K-65 Silos are being reported separately under Section IX-Removal Actions of Consent Agreement/FFCA Monthly Progress Report.
2.	REMEDIAL INVESTIGATION/ FEASIBILITY STUDY		No action required.
2.A	RI/FS work is to be conducted in accordance with the U.S. EPA guidelines.	N/A	
2.B	-- No Action Required --	-----	Status information on the RI/FS is being reported in accordance with the requirements of Section X of Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.E	Amend and submit revised RI/FS Work Plan to U.S. EPA if deficiencies are found.		Status information on the RI/FS is being reported in accordance with the requirements of Section X of Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
2.F	Implement tasks described in the approved RI/FS Work Plan.		Status information on the RI/FS is being reported in accordance with the requirements of Section X of Consent Agreement As Amended under CERCLA Sections 120 and 106(a).
3.	REPORTS AND RECORD KEEPING		
3.B	Submit monthly RI/FS progress reports.	monthly	The RI/FS Monthly Progress Report for January 1992 was transmitted to the U.S. EPA on February 20, 1992 (DOE-948-92).

TABLE 1

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**STATUS OF ACTIONS AS OF
FEBRUARY 29, 1992.**

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY92 STATUS</u>
CLEAN AIR ACT			
B.4	Prepare annual progress report on installation and replacement of emission control devices.	yearly	The Fourth Annual Progress Report on the installation and replacement of emission control devices was transmitted to the U.S. EPA on January 28, 1992 (DOE-1537-92).
C.	Provide annual reports to U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY 1991 was transmitted to the U.S. EPA on June 25, 1991 (DOE-1537-91).
D.1	Provide U.S. EPA with yearly stack-testing schedule.	yearly	The 1989 stack testing schedule was transmitted to U.S. EPA on June 16, 1989. A letter (DOE-1615-89) was transmitted to the U.S. EPA on September 15, 1989, indicating that, due to the uncertainty concerning resumption of production at the FEMP, the 1989 FFCA Stack Testing Program was being deferred. In August 1991, the DOE confirmed that no further production would take place at the facility, and renamed the facility the FEMP. Some stack operations are expected when waste processing operations are resumed. The U.S. EPA will be provided with notification of future stack testing dates when operating schedules are formulated.
D.2	Provide U.S. EPA with stack-test results for stacks tested that year.	45 days	Because the FEMP has been out of production since mid-1989, there was no opportunity to perform stack testing. The DOE, in August 1991, confirmed that no future production would take place at the FEMP. Some stack operations are expected when waste processing operations are resumed. Stack test results will be provided following the completion of testing on stacks which are returned to operation.
E.1	Maintain records of monthly particulate matter emissions.	—	Ongoing.

TABLE 1

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**STATUS OF ACTIONS AS OF
FEBRUARY 29, 1992.**

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY92 STATUS</u>
E.2	Provide quarterly reports to U.S. EPA on these emissions.	quarterly	The twenty-first Quarterly Particulate Emissions Report for the period October 1, 1991 through December 31, 1991 was submitted to the U.S. EPA February 20, 1992 (DOE-941-92). The twentieth Quarterly Particulate Emissions Report for the period July 1, 1991 through September 30, 1991 was transmitted to the U.S. EPA November 19, 1991. (DOE-370-92).
RCRA			
A.1	Conduct a hazardous waste determination on all waste streams.	30 days	Pursuant to the proposed Amended Consent Decree, RCRA waste evaluation will be conducted on all materials by 10/92.
A.2	Commence a hazardous waste analysis program for materials in the landfill and going to the incinerator.	30 days	Complete. Operations of these units was discontinued and data on the waste which had gone to them was provided in a 30-day FFCA deliverable on August 1, 1986. However, further review of both the waste stream and the potential of the units to be hazardous was required by the proposed Amended Consent Decree. Management units are being evaluated as actions required by the proposed Amended Consent Decree. Final results are due October 30, 1992.
A.5	Update the facility closure plan to reflect the year the facility expects to begin closure.	30 days	The Facility closure date is dependent upon closure schedules for individual TSD units as presented most recently in Section I of the RCRA Part B Permit Application transmitted to the Ohio EPA and the U.S. EPA on October 30, 1991 (DOE-211-92). Facility closure will be completed on the date the last TSD unit is closed.

TABLE 1

**STATUS OF ASSIGNMENTS FOR WORK REQUIRED ON
FEDERAL FACILITY COMPLIANCE AGREEMENT ACTIONS**

**STATUS OF ACTIONS AS OF
FEBRUARY 29, 1992**

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY92 STATUS</u>
RADIATION DISCHARGE INFORMATION			
A.3	Report to U.S. EPA, Ohio EPA and Ohio Department of Health the results of the continuous liquid discharge samples.	quarterly	The twenty-first Quarterly Liquid Discharge Report for period October through December 1991 was transmitted to the U.S. EPA on February 20, 1992 (DOE-941-9). The twentieth Quarterly Liquid Discharge Report for period July through September 1991 was transmitted to the U.S. EPA on November 19, 1991 (DOE-370-92).
REPORTING REQUIREMENTS			
B.	Issue monthly progress report of actions taken to ensure compliance with FFCA requirements.	monthly	December's FFCA Monthly Progress Report was transmitted to the U.S. EPA on January 21, 1992 (DOE-708-92).

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

PERIOD ENDING FEBRUARY 29, 1992

ENCLOSURE C

**FEDERAL FACILITY AGREEMENT:
CONTROL AND ABATEMENT OF RADON-222 EMISSIONS**

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Introduction

The Federal Facility Agreement (FFA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA), signed November 19, 1991, requires that a monthly report be submitted to the U.S. EPA regarding all steps undertaken in the preceding month to implement Part V of the agreement and that all data generated as a result of those actions be submitted.

Enclosure C fulfills those requirements by describing steps taken at the FEMP during the period February 1 through February 29, 1992, to implement Part V, Radon-222 Control and Abatement Plan, paragraphs 19-33 of the FFA.

Work Assignments and Progress

In this section of Enclosure C, action descriptions and work progress are presented in a format consistent with that of the FFA. Immediately following this section are the K-65 Silos Report and the Selected Radon Data Report. Reporting this data is also a requirement included in the U.S. EPA approved Silos 1 and 2 Removal Action Work Plan (Removal Action No. 4).

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
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Period Ending February 29, 1992

<u>FFA Part, Paragraph(s)</u>	<u>Description of Commitment</u>	<u>FFA Due Date</u>	<u>Status of Commitment</u>
Part V, 19 & 21	Implement the K-65 Silos 1 and 2 Removal Action in accordance with the approved Silos 1 and 2 Removal Action Work Plan.	12/1/91	Completed. Installation of the bentonite completed 11/28/91.
Part V, 20	Reduce radon-222 to a level As-Low-As Reasonably Achievable (ALARA) with the goal as specified in the Silos 1 and 2 Removal Action Work Plan.	None specified.	The Bentonite Effectiveness Environmental Monitoring Plan was submitted to the U.S. EPA on 1/28/92.
Part V, 22	Submit proposed methodology for estimating radon-222 concentration reductions resulting from completion of the Silos 1 and 2 Removal Action.	Within 60 days of completing removal action; 1/27/92.	Completed. The Bentonite Effectiveness Environmental Monitoring Plan was submitted to the U.S. EPA for comment and approval on 1/27/92.
Part V, 23	Evaluate performance of the removal action and determine whether or not additional actions are needed prior to final remediation.	None specified.	Proposed methodology for estimating radon-222 concentration reduction submitted to U.S. EPA per paragraph 20 of Part V.
Part V, 24, 25, and 33	Demonstrate compliance with NESHAP Subpart Q at the completion of final remediation using a methodology approved by the U.S. EPA. Applicable to: Silos 1, 2, and 3; Waste Pits 1, 2, 3, 4, and 5 and the Clearwell; and newly discovered radon-222 emission sources.	None specified.	No information to report for February 1992.
Part V, 26	Directly measure radon-222 flux from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the Fill/FS under the CERCLA Consent Agreement.	None specified.	No information to report for February 1992.

<u>FFA Part, Paragraph(s)</u>	<u>Description of Commitment</u>	<u>FFA Due Date</u>	<u>Status of Commitment</u>
Part V, 26	Include direct measurement data from Waste Pits 1, 2, 3, 4, and 5 and the Clearwell in the RI/FS under the CERCLA Consent Agreement.	None specified.	No information to report for February 1992.
Part V, 27	Estimate Radon-222 emissions from Silo 3 based upon characterization data; include the estimate radon-222 emission data from Silo 3 in the RI/FS that includes Silo 3 under the CERCLA Consent Agreement.	None specified.	No information to report for February 1992.
Part V, 28	Submit documentation or estimates of current radon-222 emissions from existing but newly discovered sources that contain Radium-226 in sufficient concentrations to emit radon-222 in excess of NESHAP Subpart Q prior to final remediation.	Within 30 days of discovery.	No new sources identified.
Part V, 30	Submit methodology for direct measurement or other appropriate means of characterization of the relevant emissions pursuant to paragraph 29 of the FFA.	Within 45 days of the U.S. EPA response pursuant to paragraph 29.	None required.
Part V, 31	Submit results of measurements pursuant to paragraph 30.	Within 30 days of U.S. EPA approval of characterization alignment method.	None required.
Part VI, 31	Submit monthly report on steps undertaken to implement Part V of the FFA in the preceding month.	20th day of succeeding month.	The second progress report being submitted herewith as an integral part of the CERCLA Consent Agreement Monthly Progress Report.

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

Period Ending February 29, 1992

Data Reporting Requirements: RA No. 4: Silos 1 and 2

As defined in the Silos 1 and 2 Removal Action Work Plan and the Federal Facility Agreement, data associated with monitoring the effectiveness of the bentonite installation are included in the following tables: the K-65 Silos Report and the Selected Radon Data Report.

The K-65 Silos Report includes or will include data on the following parameters:

- Ambient temperature and pressure near the silos.
- Silos 1 and 2 headspace temperature.
- Silos 1 and 2 differential pressure.
- Silos 1 and 2 radon headspace concentration.
- Silos 1 and 2 headspace humidity
(The silos 1 and 2 headspace humidity data is not available at this time. Instrumentation and the associated monitoring equipment is being installed as part of the data logging system upgrade. In the future, these data will be collected automatically).

The radon silo headspace data submitted for this period has been collected manually since the completion of the bentonite installation. An automated data logging system is currently being installed. After installation of the data logging system is completed, these data will also be automatically recorded.

The Selected Radon Data Report includes or will include radon data from the following locations:

- Air monitoring station number 5 (AMS-5)
- Air monitoring station number 6 (AMS-6)
- Pilot Plant

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
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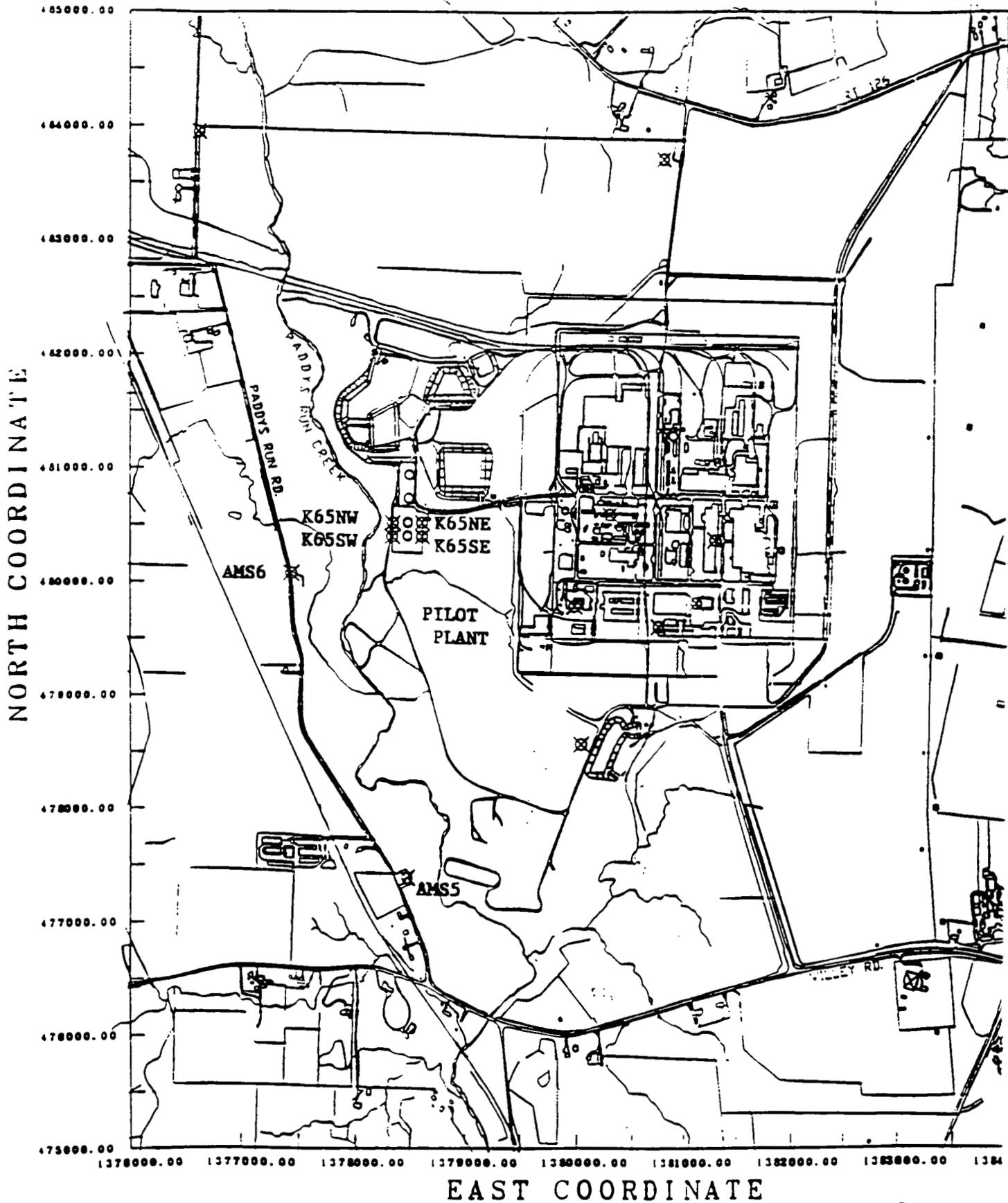
Period Ending February 29, 1992

- **Background data**
- **K-65 Monitoring Data (K-65 NW, K-65 SW, K-65 NE, K-65 SE). Figure C-6, immediately following, identifies the sampling locations.**

Minimum and maximum values are based on the lowest and highest hourly values that were recorded and incorporated into the daily averages.

REAL-TIME RADON MONITORING LOCATIONS

February, 1991 Background offsite - Hamilton



CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending February 29, 1992

K-65 SILOS REPORT

FACILITY: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

LOCATION: Silo # 1

DATE: February 1992

Day	Ambient Temp Deg. F	Pres In. Hg.	Temperature Head Space Deg. F	Inter. Hum. %	Diff. Pres In. HG	Head Space Radon (pCi/l)
1	32.8	29.7	43.0		-0.0094	
2	30.8	29.8	42.5	D	-0.0085	
3	38.3	29.7	42.5	A	-0.0071	
4	36.8	29.5	43.0	T	-0.0093	
5	33.8	29.6	43.1	A	-0.0076	
6	32.4	29.4	42.8		-0.0085	
7	34.3	29.3	42.8	N	-0.0094	
8	26.9	29.5	42.6	O	-0.0111	
9	25.3	29.9	42.2	T	-0.0097	
10	27.5	30.0	41.9		-0.0097	112800
11	*	*	*	C	*	
12	28.5	29.9	42.3	U	-0.0089	165400
13	34.0	30.0	42.2	R	-0.0087	
14	34.0	29.6	42.3	R	-0.0091	
15	*	*	*	E	*	
16	*	*	*	N	*	
17	*	*	*	T	*	160300
18	*	*	*	L	*	164800
19	*	*	*	Y	*	
20	*	*	*		*	156300
21	*	*	*	C	*	
22	*	*	*	O	*	
23	*	*	*	L	*	
24	*	*	*	L	*	136900
25	*	*	*	E	*	80100
26	*	*	*	C	*	
27	*	*	*	T	*	
28	*	*	*	E	*	153400
29	*	*	*	D	*	
ARITHMETIC						
MEAN	31.9	29.7	42.6		-0.0090	141250.0
MAXIMUM	66.1	30.0	43.2		-0.0008	165400
MINIMUM	13.8	29.3	41.6		-0.0133	80100
MEDIAN	32.8	29.7	42.5		-0.0091	154850

Note: * - data not available Head Space Radon is a grab sample

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending February 29, 1992

K-65 SILOS REPORT

FACILITY: Fernald Environmental Management Project
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

LOCATION: Silo # 2

DATE: February 1992

Day	Ambient Temperature		Temperature Head Space Deg. F	Inter. Hum. %	Diff. Pres In. HG	Head Space Radon (pCi/l)
	Temp Deg. F	Pres In. Hg.				
1	32.8	29.7	42.9		-0.0032	
2	30.8	29.8	42.5	D	-0.0027	
3	38.3	29.7	42.6	A	-0.0030	
4	36.8	29.5	43.0	T	-0.0036	
5	33.8	29.6	43.0	A	-0.0037	
6	32.4	29.4	42.8		-0.0028	
7	34.3	29.3	42.8	N	-0.0033	
8	26.9	29.5	42.6	O	-0.0034	
9	25.3	29.9	42.1	T	-0.0030	
10	27.5	30.0	41.9		-0.0026	115500
11	*	*	*	C	*	
12	28.5	29.9	42.2	U	-0.0032	110800
13	34.0	30.0	42.1	R	-0.0035	
14	34.0	29.6	42.2	R	-0.0035	
15	*	*	*	E	*	
16	*	*	*	N	*	
17	*	*	*	T	*	82100
18	*	*	*	L	*	134800
19	*	*	*	Y	*	
20	*	*	*		*	349500
21	*	*	*	C	*	
22	*	*	*	O	*	
23	*	*	*	L	*	
24	*	*	*	L	*	2900
25	*	*	*	E	*	137700
26	*	*	*	C	*	
27	*	*	*	T	*	
28	*	*	*	E	*	138000
29	*	*	*	D	*	
ARITHMETIC						
MEAN	31.9	29.7	42.5		-0.0032	133912.5
MAXIMUM	66.1	30.0	43.2		-0.0001	349500
MINIMUM	13.8	29.3	41.7		-0.0055	2900
MEDIAN	32.8	29.7	42.6		-0.0032	125150

Note: * - data not available Head Space Radon is a grab sample, the wide fluctuations in readings are being researched.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending February 29, 1992

SELECTED RADON DATA REPORT

FACILITY: Fernald Environmental Management Report
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

LOCATION: Selected Sampling Locations

DATE: February, 1992

Day	AMS 5 (pCi/L)	AMS 6 (pCi/L)	PILOT PLANT (pCi/L)	BKGRD (pCi/L)
1	0.4	0.5	0.6	0.4
2	1.0	1.0	1.0	1.1
3	1.5	1.3	1.4	1.6
4	1.2	1.0	1.2	0.8
5	0.4	0.5	0.5	0.4
6	1.2	1.0	1.2	1.3
7	0.5	0.5	0.7	0.5
8	0.3	0.6	0.7	0.4
9	0.4	0.5	0.6	0.4
10	0.8	0.6	0.8	0.5
11	0.3	0.5	0.6	0.5
12	0.3	0.5	0.6	0.4
13	0.5	0.7	0.7	0.5
14	0.4	0.6	0.6	0.4
15	0.3	0.4	0.5	0.4
16	0.3	0.4	0.5	0.4
17	0.5	0.6	0.6	0.5
18	0.4	0.5	0.5	0.4
19	0.3	0.5	0.5	0.4
20	0.3	0.4	0.6	0.4
21	0.5	0.6	0.6	0.6
22	0.9	0.9	1.0	1.0
23	1.1	1.2	1.1	1.1
24	0.4	0.6	0.6	0.4
25	0.3	0.5	0.6	0.4
26	0.3	0.5	0.6	0.4
27	0.3	0.5	0.6	0.4
28	0.4	0.5	0.6	0.4
29	0.4	0.5	0.7	0.5
30				
31				
AVERAGE	0.5	0.6	0.7	0.6
MAXIMUM	3.0	2.5	2.7	2.6
MINIMUM	0.1	0.2	0.3	0.1
MEDIAN	0.4	0.5	0.6	0.4

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT/
FEDERAL FACILITY AGREEMENT MONTHLY PROGRESS REPORT

Period Ending February 29, 1992

SELECTED RADON DATA REPORT

FACILITY: Fernald Environmental Management Report
U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton

LOCATION: Selected Sampling Locations

DATE: February, 1992

Day	NW (pCi/L)	SW (pCi/L)	NE (pCi/L)	SE (pCi/L)
1	1.4	1.1	0.6	0.8
2	1.9	3.0	2.6	3.7
3	2.2	2.9	3.1	5.2
4	0.4	2.3	1.7	2.0
5	1.7	0.9	0.4	0.6
6	1.3	3.3	2.3	3.7
7	0.5	1.0	*	1.0
8	0.9	0.6	*	1.0
9	1.2	0.7	*	0.4
10	0.8	1.2	*	0.7
11	0.4	0.7	*	0.5
12	0.8	0.9	*	0.3
13	0.7	1.2	*	0.9
14	0.9	0.9	*	0.5
15	0.4	0.6	*	0.8
16	1.1	0.6	*	1.1
17	1.1	1.6	*	0.6
18	0.4	0.8	*	*
19	0.4	0.5	0.4	*
20	0.4	0.4	0.4	*
21	0.8	1.0	0.7	*
22	*	1.9	1.6	*
23	*	2.0	1.7	*
24	0.8	0.6	0.4	0.3
25	0.7	0.6	0.4	0.5
26	0.6	0.5	0.5	*
27	0.5	0.5	0.5	*
28	0.8	0.7	0.9	*
29	0.8	1.0	0.8	*
AVERAGE	0.9	1.2	1.1	1.3
MAXIMUM	6.2	7.9	6.3	17.4
MINIMUM	0.2	0.3	0.1	0.1
MEDIAN	0.8	0.9	0.8	0.8

Note: * - data not available

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT/FEDERAL FACILITY AGREEMENT MONTHLY
PROGRESS REPORT**

PERIOD ENDING FEBRUARY 29, 1992

ENCLOSURE D

DRILLING/BORING LOGS

FERNALD
RIFFS

FIELD ACTIVITY DAILY LOG

DAILY LOG	DATE	02/22/92
	NO.	
	SHEET	1 OF 4

PROJECT NAME FEMP RIFFS PROJECT NO. 20.03.02

FIELD ACTIVITY SUBJECT: 002 RESAMPLE

DESCRIPTION ON DAILY ACTIVITIES AND EVENTS	METER CALIBRATION
<p>0740: BEGIN SETTING UP FOR SAMPLING W/HAND AUGER</p> <p>BORING #1883 JRD 2/22/92</p> <p>PERM SAMPLE PERM SAMPLE PERM SAMPLE</p> <p>0-0.5' N/A LOOSE SURFACE LITER V. STIFF, MED. BROWN (2.5Y 4/2) MOIST HIGH PLASTICITY CH H_{nu} = 0.4 ppm β_g = 40-60 cpm α = 0 ppm</p>	<p>H_{nu} Calibration Gas</p> <p>H_{nu} S/N 71111 (10.2 eV) Span 5.89 Cal. to 55 ppm</p> <p>H_{nu} S/N 1104 (10.2 eV) Span 5.80 Cal. to 55 ppm</p> <p>β Meter S/N passed Cal. check using</p> <p>α Meter S/N passed Cal. check using</p> <p>#1883 BACKGROUND H_{nu} - 0.4 ppm β_g - 40 cpm α - 0 ppm</p>

0.5-1.0' H_{nu} = 0.4 ppm YELLOW BROWN (2.5Y 5/3)
β_g = 60-80 cpm SILTY CLAY, ~~STIFF~~, STIFF, TRACE SAND ML
α = 0 ppm SLIGHTLY SAND JRD
MOIST 2/22/92

1.0-1.5' H_{nu} = 0.5 ppm LOOSE (5Y 5/2) GRAY BROWN, FRIABLE, SL. MOIST GM-GC
β_g = 60-100 cpm ABUNDANT GRAVEL, ~ 0.5-1.0" PEBBLES
α = 0 ppm

1.5-2.0' H_{nu} = 0.4 ppm LT. GRAY (5Y 7/1) ABUNDANT TO NEARLY TOTAL GRAVEL
β_g = 100-200 cpm DRY TO V. SLIGHTLY MOIST, TRACE FINE SAND GP
α = 0 ppm 0.125" - 1.5" CLASTS

SAMPLE # 67801
0905 COLLECTED & BOTTLED SAMPLE; TCLP: VOL/SVOL
VERY DIFFICULT TO ELIMINATE HEADSPACE DUE TO GRAVELLY NATURE OF SAMPLE
REPLACED CUTTINGS IN BOREHOLE

WOODED AREA HUMMOXY, SLIGHT SE SLOPE, STEEP CUT-BANK ~30' W

<p>VISITORS ON SITE:</p> <p>0840: M TURNER</p>	<p>CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.</p> <p>N/A</p>
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<p>WEATHER CONDITIONS: PARTLY CLOUDY, WIND ~40°F, CALM</p>	<p>IMPORTANT TELEPHONE CALLS:</p> <p>N/A</p>
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PERSONNEL ON SITE ANDY CLEETER, JOHN R. DUPUY, DOUGLAS SMITH

SUPERVISOR: John R. Dupuy DATE: 2/22/92

FIELD ACTIVITY DAILY LOG

DAILY LOG	DATE	22 1 02
	SHEET	2 OF 4

PROJECT NAME FEMP RI/FS PROJECT NO. 20-03-02

FIELD ACTIVITY SUBJECT: DU2 RESAMPLE

DESCRIPTION ON DAILY ACTIVITIES AND EVENTS

1006: SETTING UP ON BORING #1882 w/HAND
BACKGROUND: $H_{no} = 0.5 \text{ ppm}$
 $\beta_g = 0-20 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

METER CALIBRATION

Hour Calibration Gas	
Hour S/N 71111 (10.2 eV)	Span 5.89 Cal. to 55 ppm
Hour S/N 1104 (10.2 eV)	Span 5.80 Cal. to 55 ppm
Meter S/N	passed Cal. check usin:
Meter S/N	passed Cal. check usin:

LOSE SURFACE LITTER, WOODS TO OPEN GRASSLAND
SLIGHTLY HUMIDITY, SE SLOPE, STEEP CUT BANK
ON EAST JRD

0-0.5' ~~2/22/92~~ ~~MED STIFF~~ MEDIUM PLASTICITY, MEDIUM BROWN (2.5Y 5/4), SILTY CLAY CL, SLIGHTLY MOIST
 $H_{no} = 0.4 \text{ ppm}$ 2/22/92
 $\beta_g = 40-60 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

YELLOWISH SLIGHTLY SILTY CLAY CL, SLIGHTLY MOIST

0.5-1.0' ~~2/22/92~~ MEDIUM STIFF, SLIGHT PLASTICITY, MEDIUM STIFF, SLIGHTLY FRIABLE, MEDIUM BROWN
 $H_{no} = 0.4 \text{ ppm}$
 $\beta_g = 50-60 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

OLIVE SLIGHTLY MOIST

1.0-1.5' ~~2/22/92~~ STIFF, MEDIUM PLASTICITY, OLIVE BROWN (2.5Y 4/2), TRACE SILT, SILTY CLAY C
 $H_{no} = 0.4 \text{ ppm}$
 $\beta_g = 20-40 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

SLIGHTLY MOIST

1.5-2.0' ~~2/22/92~~ STIFF TO V. STIFF, HIGH PLASTICITY, LIGHT TO MEDIUM BROWN, SLIGHT TO FEW PE
 $H_{no} = 0.4 \text{ ppm}$
 $\beta_g = 40-60 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

CL SLIGHT TO FEW PE

SAMPLE # 6780Z
1040 COLLECTED & BOTTLED SAMPLE
TCLP: VOR/SIDC
REPLACED CUTTINGS IN BOREHOLE

VISITORS ON SITE
1007: CLRUBE

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.

WEATHER CONDITIONS: CLEAR, THIN HIGH CLOUDS
WARM ~ 50°F, WIND PICKING UP, SLIGHT BREEZE

IMPORTANT TELEPHONE CALLS

PERSONNEL ON SITE ANDY CLEETER, JOHN DUPUY, DAVE SMITH

SUPERVISOR: John R. Dupuy DATE: 2/22/92

FERNALD
RI/FS

FIELD ACTIVITY DAILY LOG

DATE	2/22/92
NO. OF SHEETS	1
SHEET	3 OF 4

PROJECT NAME FERNALD RI/FS PROJECT NO. 20-03-02

FIELD ACTIVITY SUBJECT: 042 RE-SAMPLE

DESCRIPTION ON DAILY ACTIVITIES AND EVENTS

METER CALIBRATION

1325 BEGIN HAND AUGERING OF #1885
BACKGROUND: $H_{nu} = 0.2 \text{ ppm}$
 $\beta\gamma = 40-60 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

Hour Calibration Gas
Hour S/N 71111 (10.2 eV) Span 5.89 Cal. to 55 ppm
Hour S/N 1104 (10.2 eV) Span 5.80 Cal. to 55 ppm
Meter S/N passed Cal. check us:
Meter S/N passed Cal. check us:

0-0.5' $H_{nu} = 0.1 \text{ ppm}$
 $\beta\gamma = 20-40 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

SOFT, SLIGHT PLASTICITY, LIGHT GRAY TO BROWN (5Y 4/2)
ABUNDANT PEBBLES & ASPHALT PIECES. CLAYEY TO SILTY GRAVEL
GC TO GM V. SLIGHTLY MOIST JTD 2/22/92

0.5-1.0' $H_{nu} = 0.4-0.6 \text{ ppm}$
 $\beta\gamma = 40-100 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

APPEARS TO HAVE ABUNDANT MAN-MADE FILL, MANY PIECES OF ASPHALTIC ROAD MATERIAL AT SURFACE

SOFT TO MEDIUM STIFF, LIGHT BROWN TO YELLOWISH BROWN (2.5Y 5/4)
SILTY CLAY MATRIX W/ ABUNDANT PEBBLES & ASPHALTIC ROAD MATERIAL
MEDIUM PLASTICITY CL. SLIGHTLY MOIST
JTD 2/22/92

1.0-1.5' $H_{nu} = 0.6 \text{ ppm}$
 $\beta\gamma = 60-80 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

STIFF, MEDIUM PLASTICITY, YELLOWISH BROWN (2.5Y 5/4), TRACE SILT
CL, MOIST. LOSE MAN-MADE FILL @ ~ 1.25'
CL JTD 2/22/92

1.5-2.0' $H_{nu} = 0.6 \text{ ppm}$
 $\beta\gamma = 40-60 \text{ cpm}$
 $\alpha = 0 \text{ cpm}$

SOFT, MEDIUM TO HIGH PLASTICITY, V. YELLOWISH BROWN (2.5Y 5/6)
V. SLIGHTLY MOIST
JTD 2/22/92
SAMPLE # 67803
1425 HRS COLLECTED & BOTTLED SAMPLE
TELD: 100/5100
REPLACED CUTTINGS IN BOREHOLE

OPEN GRASSLAND, HUMMOCKY, SLIGHT SOUTH SLOPE

VISITORS ON SITE

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.
N/A

WEATHER CONDITIONS:
HIGH THIN CLOUDS, WARM ~ 65°F
BREEZY

IMPORTANT TELEPHONE CALLS
N/A 90

PERSONNEL ON SITE ANDY CLESTER JOHN DUPUY DOUG SMITH

SUPERVISOR: [Signature]

FERNALD
RI/FS

FIELD ACTIVITY DAILY LOG

DATE	2/22/92
PROJECT	1
SHEET	4 OF 4

PROJECT NAME FEMP RI/FS PROJECT NO. 20.03.02

FIELD ACTIVITY SUBJECT: OIL RESAMPLE

DESCRIPTION ON DAILY ACTIVITIES AND EVENTS: METRO CALIBRATION

1605 hrs SETTING UP ON HAND AUGERED BOREHOLE #1884
 BACKGROUND: H_{nu} = 0 ppm
 βγ = 60 cpm
 α = 0 cpm

Hnu Calibration Gas
 Hnu S/N 71111 (10.2 eV) Span 5.89 Cal. to 55 ppm
 Hnu S/N 1104 (10.2 eV) Span 5.80 Cal. to 55 ppm
 # Meter S/N passed Cal. check us:
 # Meter S/N passed Cal. check us:

0 - 0.5' H_{nu} = 0.44 ppm βγ = 60.80 cpm α = 20 cpm
 VERY SOFT TO SOFT, HIGH PLASTILITY, LT. YELLOWISH BROWN (10VR 6/4) CLAY CH MOIST TO V. MOIST
 JTD 2/22/92

0.5 - 1.0' H_{nu} = 0.4 - 0.6 ppm βγ = 100 - 110 cpm α = 0 cpm
 VERY STIFF, ^{LIGHT} PLASTILITY, LIGHT BROWN (2.5Y 4/4) CLAY, DRY TO V. SLIGHTLY MOIST ML. TRACE PEBBLES.

1.0 - 1.5' H_{nu} = 0.2 ppm βγ = 20-40 cpm α = 0 cpm
 VERY STIFF, V. SLIGHT PLASTILITY, LT. YELLOWISH BROWN (2.5Y 5/3) SILTY CLAY ML DRY TO V. SLIGHTLY MOIST. TRACE V. SMALL PEBBLES

1.5 - 2.0' MEDIUM STIFF, FRIABLE, YELLOWISH BROWN (2.5Y 6/4) SILTY CLAY ML DRY
 H_{nu} = 0.2 ppm
 βγ = 60.80 cpm
 α = 0 cpm
 SAMPLE # 67804
 1600 hrs COLLECTED & BOTTLED SAMPLE
 TCLP: VOC/SVOC
 REPLACED CUTTINGS IN BOREHOLE

1645 hrs OUT OF CONTROLLED AREA & RETURN TO TRAILERS

OPEN GRASSLAND, FAIRLY FLAT LAND SURFACE, SLIGHT SW SLOPE

VISITORS ON SITE
 1610 hrs: BILL WESTERMAN, WHO DID NOT ENTER CONTROLLED AREA
 1635: RUSSEL RANDAL

CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS
 N/A

WEATHER CONDITIONS:
 HIGH CLOUDS, WARM ~60°F, BREEZY

IMPORTANT TELEPHONE CALLS
 N/A 91

PERSONNEL ON SITE ANDY CLEETER, JOHN DUPUY, DONG SMITH

SUPERVISOR: John R. Dupuy

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 3679	COORDINATES:	DATE: 2-3-92
ELEVATION:	GWL: Depth 64.95 Date/Time 2-3-92	DATE STARTED: 1-30-92
ENGINEER/GEOLOGIST: J. Lear	Depth	DATE COMPLETED: 2-5-92
DRILLING METHODS: Cable Tool	Date/Time	PAGE 1 OF 9

DEPTH 11.4	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16"	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	See B# 1679 # 2679			Sample description can be cross referenced from boring nos. 1679 & 2679 up to 85.0ft			See B# 1679 & 2679
35							
85							

92

NOTES:
 Drilling Contractor - Penn Drilling
 Drilling equipment - Cyclone 43
 Driller - Craig Coulter
 Asst - Gary Dye
 S.A.A. Same as above
 Backgrounds
 Au - 0 ppm
 Bb - 30-60 ppm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 3679	COORDINATES:
ELEVATION:	DATE 1-30-92
ENGINEER/GEOLOGIST: J. Lear	GWL: Depth Date/Time DATE STARTED: 1-30-92
DRILLING METHODS: Cable tool	Depth Date/Time DATE COMPLETED: 2-5-92
PAGE 2 OF 89	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 in	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USC)	REMARKS
85							
86	SB400 0915 1-30-92	5 6 7	16	med stiff - stiff (10yr. 5/1 to 2.54, 4/12) gray to dark grayish brown, silt and clay laminated throughout, high plasticity, wet.	ml/c	5-1.5	H _{nu} - 0 ppm B ₈ - 50 cpm
87							
88							
89							
90	SB401 0930 1-30-92	27 150 10	18	v. Dense, grayish brown (2.54, 5/2) silt, some clay, laminated well graded sand and gravel at 90.50', wet to v. moist	mlc	NA	H _{nu} - 0 ppm B ₈ - 60 cpm
91							
92							

NOTES
 Drilling Contractor - Penn Drilling
 Drilling Equipment - Cyclone 43
 Driller - Craig Cortner
 Asst. - Gary Dye

S.A.A - Same As Above
 Backgrounds
 H_{nu} - 0 ppm
 B₁ - 30-60 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.3.23	PROJECT NAME: EMP RI/FS
BORING NUMBER: 3679	COORDINATES:
ELEVATION:	DATE 1-30-92
ENGINEER/GEOLOGIST: J. Lear	GWL: Depth Date/Time
DRILLING METHODS: Cable Tool	DATE STARTED: 1-30-92
	DATE COMPLETED: 2-5-92
	PAGE 23 OF 89

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16in	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
14							
13							
94							
95	38402	4		Stiff, dark grayish brown, (2.5% 4/2) clayey silt, low plasticity, wet to U. moist.	ML	1.0 - 1.5	14-10-92 H ₂ O - 0 ppm
96	030	6	12	med dense, grayish brown, (2.5% 4/2) well graded sand, some gravel, wet.	SW	NA	B ₆ - 50 ppm
	1-30-92	15					
97							
98							
99							

NOTES
See page 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 3679	COORDINATES:
ELEVATION:	DATE: 1-30-92
ENGINEER/GEOLOGIST: J. Lear	GWL: Depth Date/Time
	DATE STARTED: 1-30-92
	Depth Date/Time
DRILLING METHODS: Cable Tool	DATE COMPLETED: 2-5-92
	PAGE 34 OF 89

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISPT)	REMARKS
99	38403	10		V. dense (2.54. 4/2) well graded gravelly sand, wet.	SW	NA	H _{nu} - 0 ppm
101	1100	18	10	V. stiff. (2.54. 4/2) silty clay, laminae sand and gravel at 100.80"; low plastic, V. moist to wet	CL	2.5	BB - 50 cpm
	1-30-92	35					
102							
103							
104							
105	39404	.5		V. Dense, (57. 3/2) dark olive gray, clayey silt, some well graded gravel, moist to wet.	ML	NA	H _{nu} - 0 ppm
106	1720	34	8				BB - 30 cpm
	1-30-92	50					
107							

NOTES
See P91

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1.02.3.23	PROJECT NAME: EMP RI/FS	
BORING NUMBER: 3679	COORDINATES:	DATE: 1-30-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 1-30-92
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 2-5-92
DRILLING METHODS: Cable Tool		PAGE 45 OF 89

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16" 1	RECOVERY 1/4 1	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
108							
109							
110	38405	8		m. Dense, dark gray (10y, 4/1) silt, trace clay. moist to wet.	ML NA	NA	W _{nu} - .0 ppm
111	1750	9	9				B ₈ - 40µm
	1-30-92	18					
112							

NOTES
see pg 1

VISUAL CLASSIFICATION OF SOIL ;

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 3679	COORDINATES:
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time
DRILLING METHODS: Cable Tool	

DATE 1-31-92
 DATE STARTED: 1-30-92
 DATE COMPLETED: 2-5-92
 PAGE 56 OF 89

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY	REMARKS
115							
	38406	8		med dense, dark gray, (5% vl) silty clay, wet.			
116	0990	9	13		ML	NA	H ₂ O - 0 ppm
	1-31-92	19					BB - 300 ppm
117							
118							
119							
120	38407	12		stiff, dark gray (5% vl) silty clay, grading to dense dark gray, clayey silt, med plasticity, v. moist to wet.	CL/m	J.L. 21.0 F.O. 1-29-92	H ₂ O - 0 ppm
121	1000	15	18				BB - 400 ppm
	1-31-92	18					
122	38408	5		med dense, dark gray, (5% vl) clayey silt to silt. Some clay. wet.	ML	NA	H ₂ O - 0 ppm
	1015	8	18				
	1-31-92						

NOTES
 see page 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: TEMP. RI/FS
BORING NUMBER: 3679	COORDINATES:
ELEVATION:	DATE: 1-31-92
ENGINEER/GEOLOGIST: J. Lear	GWL: Depth Date/Time
DRILLING METHODS: Cable Tool	DATE STARTED: 1-30-92
	DATE COMPLETED: 2-5-92
	PAGE 67 OF 89

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 1' (in 1')	RECOVERY (in 1')	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USE)	REMARKS
123	38400 cont.	15	see Above	Continued continued from J.L. 1-31-92 Above			J.L. 2-4-92 38 - 30 cpm
124							J.L. 1-31-92
125							
126							
127							
128	38407	8					
129	1100	15	15	S.A.A	ML NA		40 - 0 ppm 38 - 40 cpm
				Bottom of Sampling 129.5 FT			
				Bottom of Drilling 129.5 FT			
				* 1/2" Blue Clay encountered			

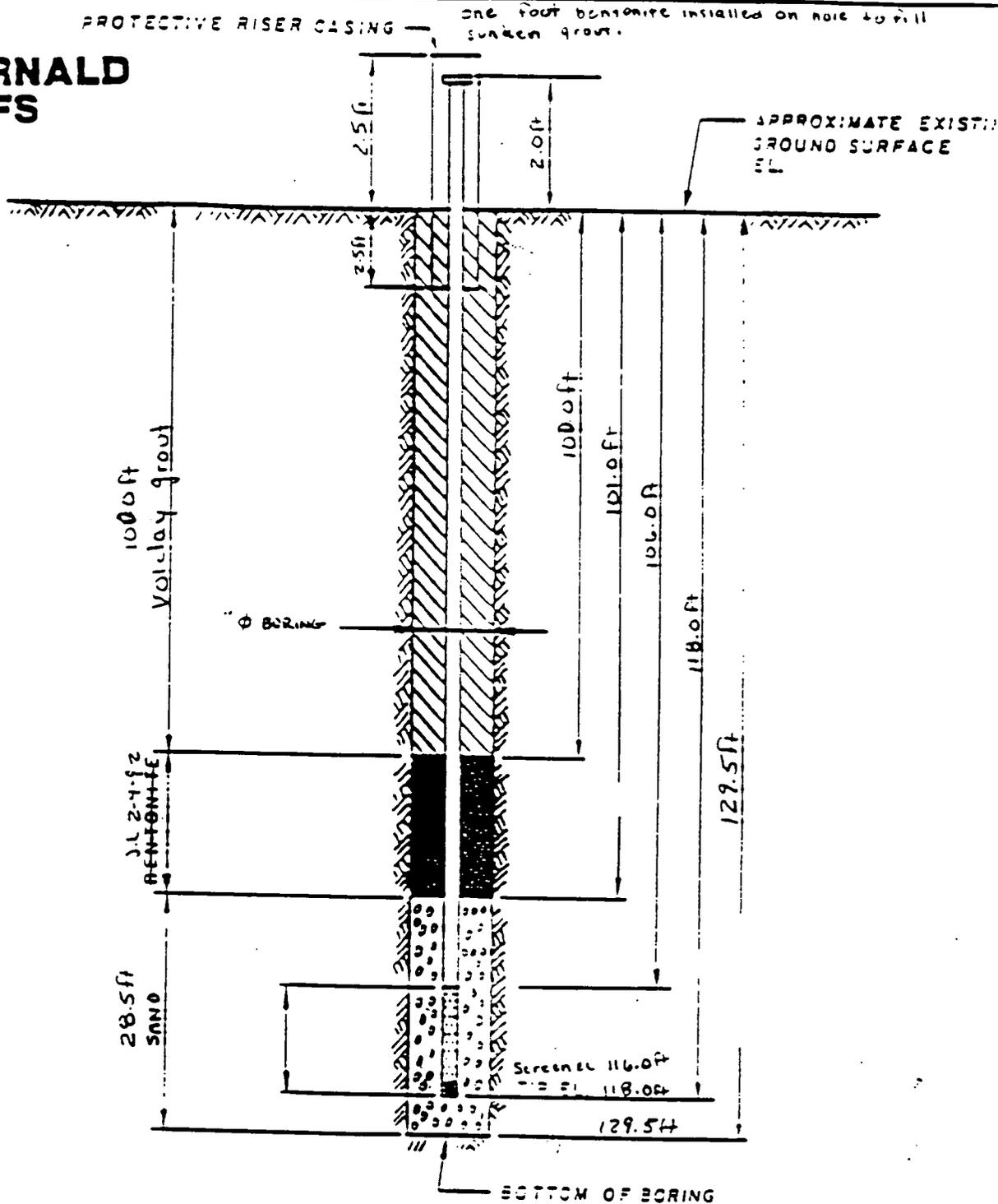
NOTES see page 1

**FERNALD
RI/FS**

PROTECTIVE RISER CASING

ONE FOOT BENTONITE INSTALLED ON HOLE TO FILL
SUNKEN GROUT.

DRAWING NUMBER	
CHECKED BY	
APPROVED BY	
J. L. Car	2-4-72
DRAWN BY	



NOTES:

1. RISER PIPE IS 4.0 IN I.D. ^{316 Stainless Steel} SCHEDULE 11.2-3-12 PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN IS 4.0 IN I.D. SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 66.95 FT
5. WATER LEVEL READING ON 2-5-72

900 gals H₂O used

8 bags 10020 sand

20 bags voidlay grout used

NO bentonite plug installed

2 buckets bentonite used on top of hole

INSTALLATION DETAILS
MONITORING WELL

3679

PREPARED FOR

Fernald RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. J. Lear DATE 2-4-92
 PROJECT NO. 602.3.23 CHECKED BY [Signature] DATE 3/2/92
 BORING NO. 3679
 PIEZOMETER NO. 3679 DATE OF INSTALLATION 2-3/2-5-92

BOREHOLE DRILLING

DRILLING METHOD <u>Cable Tool</u>	TYPE OF BIT <u>Churn bit</u>
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID <u>H₂O</u> FROM <u>0ft</u> TO <u>130ft</u>	SIZE <u>8in</u> FROM <u>0ft</u> TO <u>130ft</u>
FLUID <u>NA</u> FROM <u> </u> TO <u> </u>	SIZE <u>NA</u> FROM <u> </u> TO <u> </u>

PIEZOMETER DESCRIPTION

TYPE <u>Stainless steel</u>	RISER PIPE MATERIAL <u>316 stainless steel</u>
DIAMETER OF PERFORATED SECTION <u>4.0in</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>4 3/8</u> I.D. <u>4.0in</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> <u>slotted</u> SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10ft</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010in</u>	JOINING METHOD <u>Threaded Flush Joined</u>
TOTAL PERFORATED AREA <u>10ft</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft</u>	OTHER PROTECTION <u>Hinged Protective Riser</u>
PROTECTIVE PIPE O.D. <u>10.75in</u>	<u>Locked, vented well cap</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ()		
TOP OF RISER PIPE	2.0				
GROUND SURFACE	0.0				
BOTTOM OF PROTECTIVE PIPE	2.5				
BOREHOLE FILL MATERIALS:	GROUT/SLURRY	TOP <u>121.0</u>	BOTTOM <u>101.0</u>	TCP	BOTTOM
	BENTONITE	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
	SAND	TOP <u>101.0</u>	BOTTOM <u>121.5</u>	TOP	BOTTOM
	GRAVEL	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>106.0</u>	BOTTOM <u>116.0</u>	TOP	BOTTOM	
PIEZOMETER TIP	118.0				
BOTTOM OF BOREHOLE	129.5				
GWL AFTER INSTALLATION	66.95				

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES NO

REMARKS 2ft was cut from the top of the riser pipe
1 bentonite bucket used to fill up fallen grout at 1.0 ft below surface

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 402-3.22	PROJECT NAME: Fernald RI/FS EWMF	
BORING NUMBER: 1728	COORDINATES:	DATE: 2/16/92
ELEVATION:	GWL: Depth 20.3 Date/Time 2/16/92	DATE STARTED: 2/14/92
ENGINEER/GEOLOGIST: O. O'Brum	Depth	Date/Time
DRILLING METHODS: Cable Tool	DATE COMPLETED: 2/16/92	
	PAGE	OF 3

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
1				For soil description refer to boring 2728			

27

NOTES:

Drilling Contractor: Ann Drill

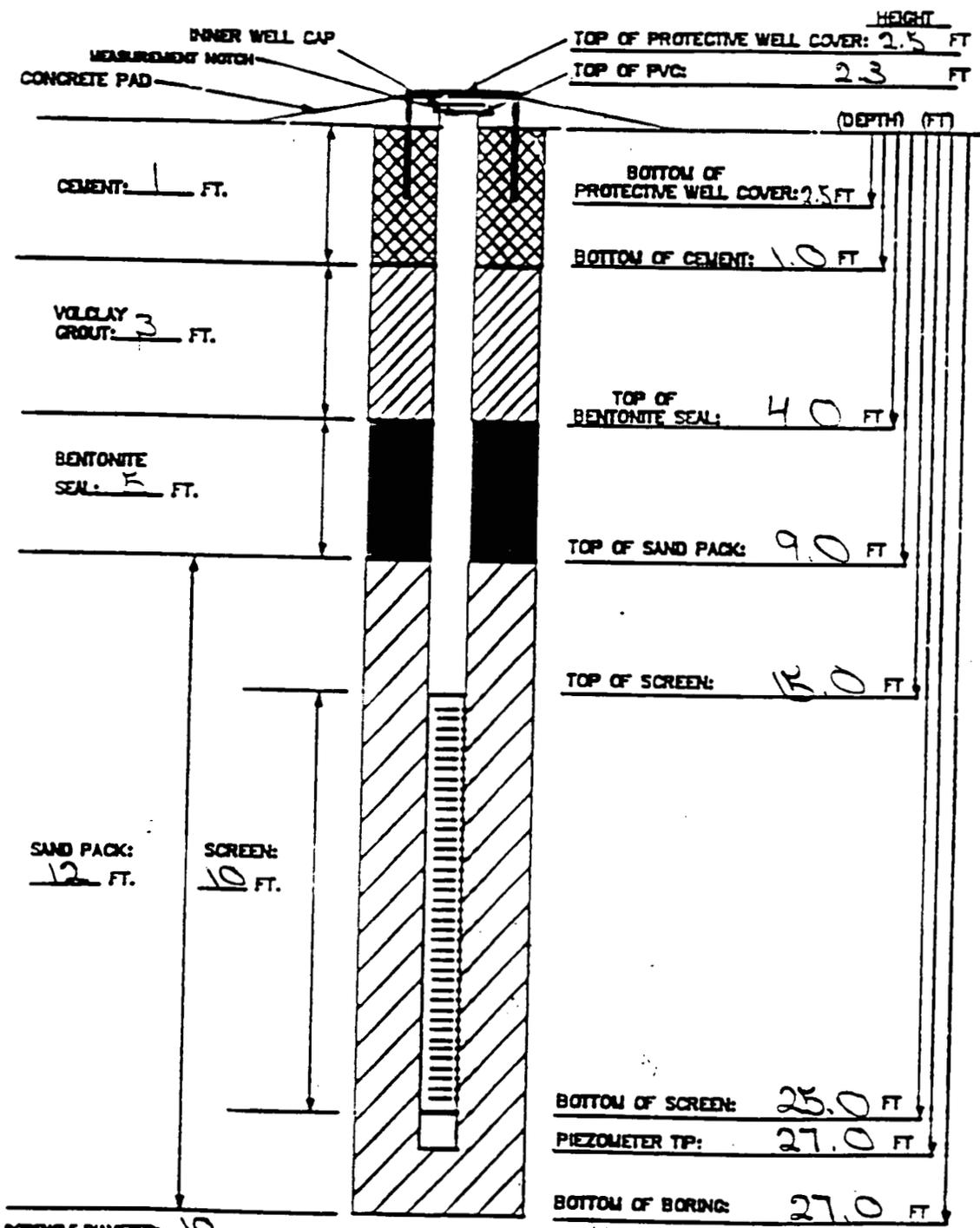
Drilling Equipment: _____

Driller: Joe Bagile
Rick Purcell

HNU = 0 ppm
BX = 40 cpm

FERNALD RI/FS
INSTALLATION DIAGRAM
MONITORING WELL NO.
1728

INSTALLATION DATE: 2/6/92



MATERIALS USED:
 SAND TYPE AND QUANTITY: 10 bag
 BENTONITE PELLETS (5-GALLON BUCKETS): 6
 BAGS OF VOLCLAY GROUT: 1 bag
 AMOUNT OF CEMENT: 1 bag
 AMOUNT OF WATER USED: 130 gal
 OTHER:

- NOTES:**
- 1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINT.
 - 2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
 - 3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED PLUG.
 - 4) WATER DEPTH/DATE:
 - 5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
 - 6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 3.22

GEOLOGIST/ENGINEER: D. O'Brien

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FQMF FIELD ENG./GEO. D.O'Brien DATE 2/6/92
 PROJECT NO. 102.3.22 CHECKED BY _____ DATE _____
 BORING NO. 1728
 PIEZOMETER NO. _____ DATE OF INSTALLATION 2/6/92

BOREHOLE DRILLING

DRILLING METHOD <u>Cable Tool</u>	TYPE OF BIT <u>Churn Bit</u>
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID <u>H₂O</u> FROM <u>0</u> TO <u>27.0</u>	SIZE <u>10 3/4"</u> FROM <u>0</u> TO <u>27.0</u>
FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

PIEZOMETER DESCRIPTION

TYPE <u>Monitoring Well</u>	RISER PIPE MATERIAL <u>316 stainless steel</u>
DIAMETER OF PERFORATED SECTION <u>4.0 ID</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>4</u> O.D. <u>4.0</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10' Screen w/ 2' Sum.</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010</u>	JOINING METHOD <u>Flush joint threads</u>
TOTAL PERFORATED AREA <u>10.0 ft²</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5.0</u>	OTHER PROTECTION <u>hinged locking cap</u>
PROTECTIVE PIPE O.D. _____	

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (ft)		ELEVATION ()			
TOP OF RISER PIPE	<u>2.3 ft</u>					
GROUND SURFACE	0.0					
BOTTOM OF PROTECTIVE PIPE	<u>2.5</u>					
BOREHOLE FILL MATERIALS: <u>Cement</u> GROUT/SLURRY BENTONITE SAND GRAVEL	TOP	<u>0</u>	BOTTOM	<u>4</u>	TCP	BOTTOM
	TOP	<u>4</u>	BOTTOM	<u>9</u>	TOP	BOTTOM
	TOP	<u>9</u>	BOTTOM	<u>27</u>	TOP	BOTTOM
	TOP		BOTTOM		TOP	BOTTOM
PERFORATED SECTION	TOP	<u>15</u>	BOTTOM	<u>25</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>27</u>					
BOTTOM OF BOREHOLE	<u>27</u>					
GWL AFTER INSTALLATION						

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES NO

REMARKS _____

BERNARD
RI/FS

VISUAL CLASSIFICATION OF SOILS

602-20-03-03
 PROJECT NUMBER: ~~602-20-03-03~~ PROJECT NAME: FEMP RI/FS
 BORING NUMBER: 1846 COORDINATES: DATE: 2-22-92
 ELEVATION: GWL: Depth Date/Time DATE STARTED: 2-22-92
 ENGINEER/GEOLOGIST: Ken Marion Depth Date/Time DATE COMPLETED: 2-22-92
 DRILLING METHODS: 8" Hollow Stem Auger PAGE 1 OF 4

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (SI)	REMARKS
0	67701 1050	2 4	16	Loose Black (2.5Y, 2/0) SILT (FLYASH) with slag fragments (The slag fragments range from silt and sand to trace amounts of gravel), slightly moist	ML	N/A	H _{nu} = 0 ppm B _x = 20 cpm c = 0 cpm
1.5	67702 1058	5 7	18	Medium dense Black (2.5Y, 2/0) SILT (FLYASH) with slag fragments (The slag fragments range from silt and sand to trace amounts of gravel), dry	ML	N/A	H _{nu} = 0 ppm B _x = 20 cpm c = 0 cpm
3.0	67703 1110	7 10	7	Medium dense K.M. 2-22-92 Same As Above	ML	N/A	H _{nu} = 0 ppm B _x = 20 cpm c = 0 cpm
4.5	67704 1253	7 7	13	Medium dense K.M. 2-22-92 Same As Above	ML	N/A	H _{nu} = 0 ppm B _x = 20 cpm c = 0 cpm
6.0	67705 67706 1302	5 6	18	Medium dense Black (2.5Y, 2/0) SILT (FLYASH) with slag fragments (The slag fragments range from silt and sand to trace amounts of gravel), one gravel size piece of coal, dry	ML	N/A	H _{nu} = 0 ppm B _x = 20 cpm c = 0 cpm Archive TAL "0"

NOTES
 Drilling Company: Pennsylvania Drilling
 Driller: Dave Newman
 Assistant Driller: Mark Rebold

Samples Collected per ASTM Standard Penetration Test Colors Identified using Munsell color chart

Using 3" split spoons

H_{nu} S/N: 1185 / 0 ppm } Background
 B_x S/N: 50760 / 20 cpm } Levels
 c S/N: 50768 / 0 cpm }

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER	602-22-03-02	PROJECT NAME	FEMPO RI/FS
BORING NUMBER:	1022 1846	COORDINATES:	
ELEVATION:		GWL: Depth Date/Time	DATE 2-22-92
ENGINEER/GEOLOGIST	Ken Marion	Depth Date/Time	DATE STARTED: 2-22-92
DRILLING METHODS:	8" Hollow Stem Auger		DATE COMPLETED: 2-22-92
			PAGE 2 OF 4

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN.	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (psi)	REMARKS
7.5	67707 1325 2-22-92	6 8 8	18	Medium dense Black (2.5%, 2/0) SILT (FLYASH) with slag fragments (The slag fragments range from silt and sand to trace amounts of gravel), dry	ML N/A		H _{nu} = 0 ppm B _r = 20 cpm α = 0 cpm
9.0	67708 1425 2-22-92	26 12 8	18	Same As Above	ML N/A		H _{nu} = 0 ppm B _r = 20 cpm α = 0 cpm Sampled through a limestone cobble
10.5	67709 1035 2-22-92	6 7 12	18	Same As Above	ML N/A		H _{nu} = 0 ppm B _r = 20 cpm α = 0 cpm
12.0	67710 1440 2-22-92	10 12 17	18	Same As Above	ML N/A		H _{nu} = 0 ppm B _r = 20 cpm α = 0 cpm
13.5	67711 1445 2-22-92	10 12 8	18	Medium dense Black (2.5%, 2/0) SILT (FLYASH) with slag fragments (The slag fragments range from silt and sand to trace amounts of gravel), trace brick fragments, dry	ML N/A		H _{nu} = 0 ppm B _r = 20 cpm α = 0 cpm TAL "0"

NOTES

Bottom of Bore Hole at 15.0 ft.

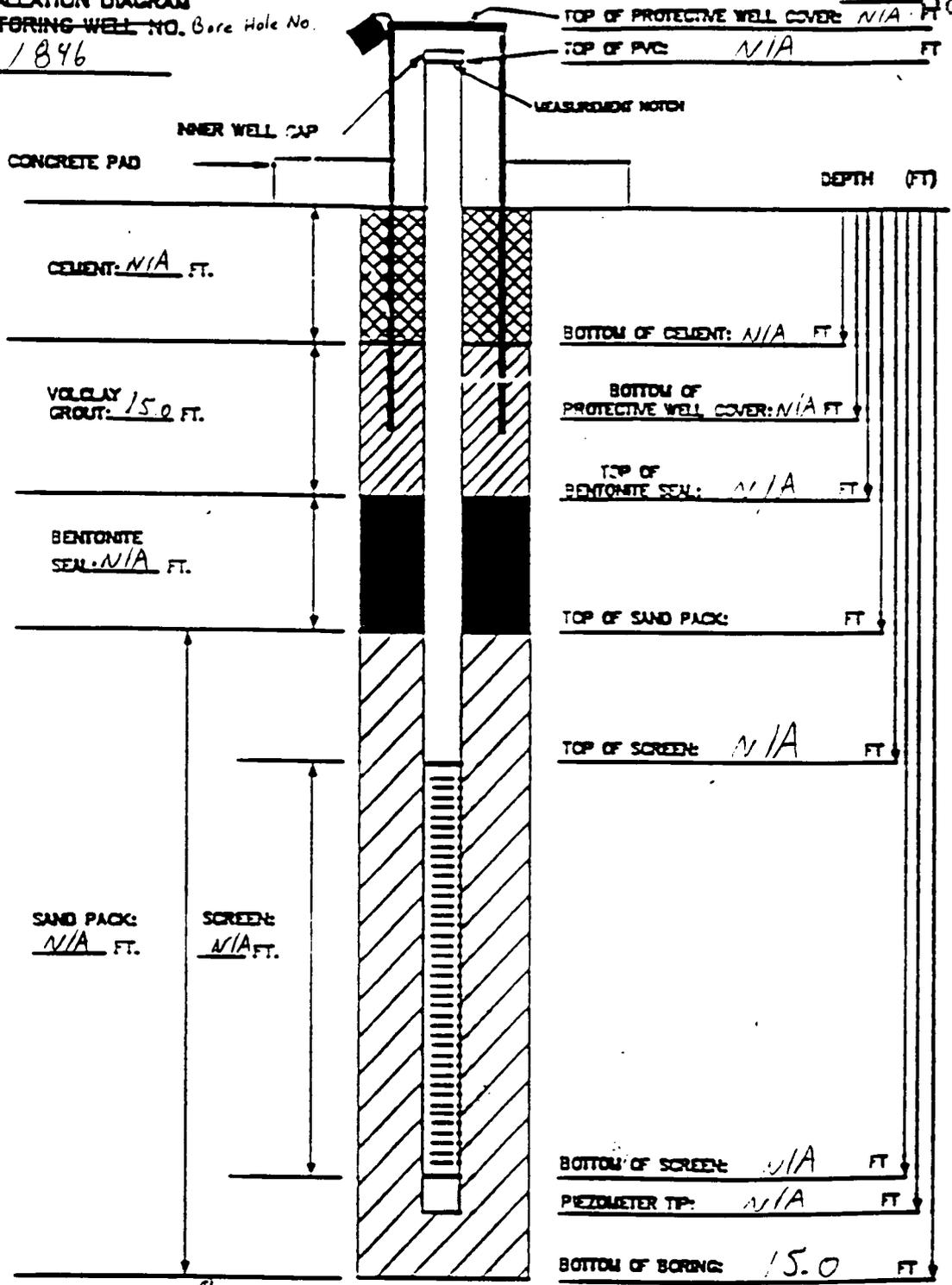
FERNALD RI/FS

Stickups

INSTALLATION DATE: 2-22-92

K.M. INSTALLATION DIAGRAM
 MONITORING WELL NO. Bore Hole No.
 2-22-92 1846

HEIGHT 3840



TOP OF PROTECTIVE WELL COVER: N/A FT
 TOP OF PVC: N/A FT

DEPTH (FT)

CEMENT: N/A FT.

BOTTOM OF CEMENT: N/A FT

VOLCLAY GROUT: 15.0 FT.

BOTTOM OF PROTECTIVE WELL COVER: N/A FT

BENTONITE SEAL: N/A FT.

TOP OF BENTONITE SEAL: N/A FT

TOP OF SAND PACK: FT

SAND PACK: N/A FT.

SCREEN: N/A FT.

TOP OF SCREEN: N/A FT

BOTTOM OF SCREEN: N/A FT

PIEZOMETER TIP: N/A FT

BOTTOM OF BORING: 15.0 FT

BORINGHOLE DIAMETER: 3 INCHES

MATERIALS USED:

- SAND TYPE AND QUANTITY: N/A
- BENTONITE PELLETS (5-GALLON BUCKETS): N/A
- BAGS OF VOLCLAY GROUT: 1 Bag
- AMOUNT OF CEMENT: N/A
- AMOUNT OF WATER USED: 25 Gallons
- OTHER: N/A

NOTES:

- 1) REEL PVC IS NOT SCREENED TO K.M.
- 2) SCREEN IS NOT SCREENED TO 2-22-92.
- 3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED CAP.
- 4) WATER DEPTH/DATE: N/A

TASK: 20.03.02

GEOLOGIST/ENGINEER: Ken Marion

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEMP RT/SS FIELD ENG./GEO. Ken M. Lion DATE 2-23
 PROJECT NO. 602.20.c3.02 CHECKED BY [Signature] DATE 3/1/92
 BORING NO. 1846
 PIEZOMETER NO. N/A DATE OF INSTALLATION 2-22-92

BOREHOLE DRILLING

DRILLING METHOD <u>Hollow Stem Augers</u>	TYPE OF BIT <u>Bull Dog</u>
DRILLING FLUID(S) USED:	CASING SIZE(S) USED:
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

PIEZOMETER DESCRIPTION

TYPE <u>N/A</u>	RISER PIPE MATERIAL <u>N/A</u>
DIAMETER OF PERFORATED SECTION <u>N/A</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>N/A</u> I.D. <u>N/A</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>N/A</u>
AVERAGE SIZE OF PERFORATIONS <u>N/A</u>	JOINING METHOD <u>N/A</u>
TOTAL PERFORATED AREA <u>N/A</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>N/A</u>	OTHER PROTECTION <u>N/A</u>
PROTECTIVE PIPE O.D. <u>N/A</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (ft)		
TOP OF RISER PIPE	<u>N/A</u>		<u>N/A</u>		
GROUND SURFACE	0.0				
BOTTOM OF PROTECTIVE PIPE	<u>N/A</u>		<u>N/A</u>		
BOREHOLE FILL MATERIALS:					
	GROUT/SLURRY	TOP <u>0.0</u>	BOTTOM <u>15.0</u>	TCP	BOTTOM
	BENTONITE	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
	SAND	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
GRAVEL	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	
PERFORATED SECTION	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	
PIEZOMETER TIP	<u>N/A</u>		<u>N/A</u>		
BOTTOM OF BOREHOLE	<u>15.0</u>				
GWL AFTER INSTALLATION	<u>N/A</u>		<u>N/A</u>		

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? N/A YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? N/A YES NO

REMARKS Replacement Boring For 1773

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.20.03.02 PROJECT NAME: BU-2 Red Hill
 BORING NUMBER: 1849 COORDINATES: DATE: 2/22/92
 ELEVATION: GCL: Depth Date/Time DATE STARTED: 2/22/92
 ENGINEER/GEOLOGIST: D. O'Brien Depth Date/Time DATE COMPLETED: 2/22/92
 DRILLING METHODS: Hollow Stem Auger PAGE 1 OF 88

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 150MM	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
1	0902 67601 2/22/92	3	12	Medium stiff, 10YR (5/5) brown. Silty clay w/ sand. No plasticity, slightly moist	CI	.75	HNU = 0 ppm RS = 40 cpm α = 10 cpm
2	0915 67602 2/22/92	10	15	Hard, 10YR (5/4) yellowish brown. Silty clay, no plasticity, slightly moist	CI	1.40	HNU = 3 ppm RS = 80 cpm α = 0 cpm
3	0945 67603 2/22/92	10	9	Stiff, 10YR (5/4) yellowish brown, silty clay with large cobbles, no plasticity, slightly moist	CI	1.5	HNU = 0 ppm RS = 60 cpm α = 10 cpm
4	0950 67604 2/22/92	12	0	NO Recovery	NA	NA	Rock in spoon.

NOTES:
 Drilling Contractor: Ann Drill
 Drilling Equipment: _____
 Driller: Joe Barile
Craig Carter

NA - not applicable
 Skop: HNU = 0 ppm
 RS = 40-60 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 002 20 03 02 PROJECT NAME: OU-2 Redrill
 BORING NUMBER: 1849 COORDINATES: _____ DATE 2/22/92
 ELEVATION: _____ GWL: Depth _____ Date/Time _____ DATE STARTED: 2/22/92
 ENGINEER/GEOLOGIST: D. O'Neil Depth _____ Date/Time _____ DATE COMPLETED: 2/22/92
 DRILLING METHODS: Hollow Stem Auger PAGE 2 OF 2

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 10 IN	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
7	1010 67604	10	100	Soft brown dense black silt some gravel, dry. (Possible fly ash.)	MI	NA	HNU = 0 ppm BS = 60 cpm
8	1030 67605	6	100	Loose black silt dry (Possible fly ash)	MI	NA	HNU = 0 ppm BS = 53 cpm
9	1035 67606	5	100	SAA	MI	NA	HNU = 0 ppm BS = 40 cpm
11	1040 67607	12	100	SAA	MI	NA	HNU = 0 ppm BS = 40 cpm

NOTES:
 Drilling Contractor: Penn Drill
 Drilling Equipment: _____
 Driller: Joe Bonville
Craig Coulter

SAA - SAME AS ABOVE
 NA - NOT APPLICABLE

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102-20-03-02 PROJECT NAME: OU-2 Pcdrill
 BORING NUMBER: 1749 COORDINATES: _____ DATE 2/22/92
 ELEVATION: _____ GWT: Depth _____ Date/Time _____ DATE STARTED: 2/22/92
 ENGINEER/GEOLOGIST: D. O'Brien Depth _____ Date/Time _____ DATE COMPLETED: 2/22/92
 DRILLING METHODS: Hollow Stem Auger PAGE 3 OF 3

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 100mm	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	REMARKS
13	1045 67608 26282	13	13	Loose black silt, dry (possible fly ash)	MI NA	NA	HNU = 0 ppm BS = 40 cpm
14	1050 67609 26283	2	18	SAA	MI NA	NA	HNU = 0 ppm BS = 40 cpm
16	1085 67610 26284	3	18	SAA	MI NA	NA	HNU = 0 ppm BS = 50 cpm
17	1100 67611 26285	19	18	SAA	MI NA	NA	HNU = 0 ppm BS = 40 cpm

NOTES:
 Drilling Contractor: Penn Drill
 Drilling Equipment: _____
 Driller: Joe Barile
Craig Cavities

SAA - same as above
 NA - not applicable

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.20.03.02	PROJECT NAME: OU-2 RCD III	
BORING NUMBER: 1349	COORDINATES:	DATE: 2/22/92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 2/22/92
ENGINEER/GEOLOGIST: D. O'Brien	Depth Date/Time	DATE COMPLETED: 2/22/92
DRILLING METHODS: Hollow Stem Auger	PAGE 4	OF 8

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 15 IN	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%SF)	REMARKS
19	1105 67612	2 2	18	Loose, block silt, dry (possible fly ash)	MI NA	NA	HNO = 0ppm RS = 40cpm
20	1110 67613	2 3	8	SAA	MI NA	NA	HNO = 0ppm RS = 50cpm
21	1310 67614	2 3	8	SAA	MI NA	NA	HNO = 0ppm RS = 40cpm
23	1315 67615	2 3	8	SAA	MI NA	NA	HNO = 0ppm RS = 60cpm

NOTES:

Drilling Contractor: Penn Drill

Drilling Equipment: _____

Driller: Joe Morille
Craig Coulter

SAA - SAME AS ABOVE
NA - NOT APPLICABLE

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.20.03.02 PROJECT NAME: 002 Padmill
 BORING NUMBER: 1849 COORDINATES: _____ DATE 2/22/92
 ELEVATION: _____ GRL: Depth _____ Date/Time _____ DATE STARTED: 2/22/92
 ENGINEER/GEOLOGIST: D. O'BRIEN Depth _____ Date/Time _____ DATE COMPLETED: 2/22/92
 DRILLING METHODS: Hollow Stem Auger PAGE 45 OF 878

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
26	W2 67616 2/22/92	6	8	SAA Loose, black silt dry (possible fly ash)	MI	NA	HNU = 0 ppm BX = 60 cpm
27	W2 67616 2/22/92	12	8	SAA	MI	NA	HNU = 0 ppm BX = 40 cpm
28	W2 67617 2/22/92	2	18	SAA	MI	NA	HNU = 0 ppm BX = 60 cpm
29	W7 67618 2/22/92	18	18	med. stiff clay soft. 2.54 (1/2) Grayish brown silty clay w/ small amount of sand. No plasticity noted.	CI	75	HNU = 0 ppm BX = 60 cpm

NOTES:
 Drilling Contractor: Penon Drill
 Drilling Equipment: _____
 Driller: Jay Parille
Craig Carter

SAA - SAME AS ABOVE
 NA - NOT APPLICABLE

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.20.03.02 PROJECT NAME: 002 PISANALING
 BORING NUMBER: 1849 COORDINATES: _____ DATE: 2/22/92
 ELEVATION: _____ GWL: Depth _____ Date/Time _____ DATE STARTED: 2/22/92
 ENGINEER/GEOLOGIST: D. O'BRIEN Depth _____ Date/Time _____ DATE COMPLETED: 2/22/92
 DRILLING METHODS: Hollow Stem Auger PAGE 86 OF 78

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 100mm	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
29.4			100				030 2/22/92
30.5	1340 67619	10	100	Stiff. 2.5y (5/2) Grayish brown silty clay. No plasticity, moist	cl	1.0	HNu = 0 ppm BB = 30 cpm
31.5		9	100				
32.5	1345 67620	12	100	Stiff. 2.5y (4/3) Olive brown silty clay with gravel. No plasticity, moist	cl	1.0	HNu = 0 ppm BB = 60 cpm
33.5		7	100				
34.5		9	100				
35.5				End of boring 33 ft.			

NOTES:
 Drilling Contractor: Ann Drill
 Drilling Equipment: _____
 Driller: The Boss
Craig Carter

3840

7018

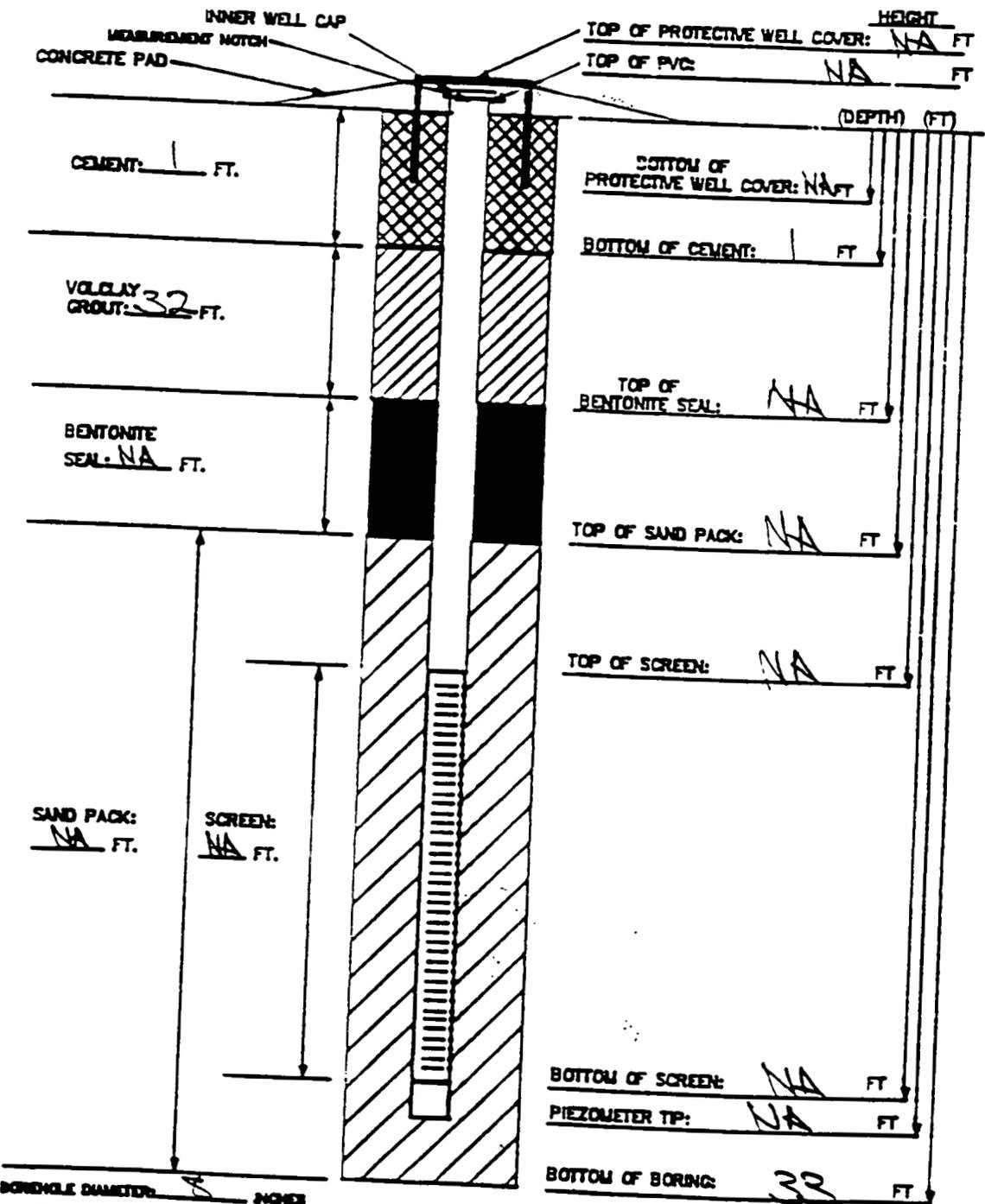
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3/2

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.

1849

INSTALLATION DATE: 2/22/92



MATERIALS USED:

- SAND TYPE AND QUANTITY:
- BENTONITE PELLETS (3-GALLON BUCKETS):
- BAGS OF VOLCLAY GROUT: 3 bags
- AMOUNT OF CEMENT: 1 1/2 bags
- AMOUNT OF WATER USED: 60 gal.
- OTHER:

NOTES:

- 1) RISER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINT.
- 2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 6/32-INCH SLOTS.
- 3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SLAP.
- 4) ENTER DEPTH/DATE:
- 5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER FLUG AND PADLOCK.
- 6) PARALLELS INDICATE DEPTH BELOW GROUND LEVEL.

TASK: W09.20.0302 GEOLOGIST/ENGINEER: D.O'Rourke

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FUMF FIELD ENG./GEO. D. O'Brien DATE 2/22/90
 PROJECT NO. 9102-3.22 CHECKED BY C. Gule DATE 3/17/90
 BORING NO. 1849
 PIEZOMETER NO. NA DATE OF INSTALLATION 2/22/90

BOREHOLE DRILLING

DRILLING METHOD <u>Hollow Stem Auger</u>	TYPE OF BIT <u>NA</u> <u>Auger</u>
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	SIZE <u>NA</u> <u>3.0 in. ID</u> FROM <u>NA</u> TO <u>NA</u>
FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

PIEZOMETER DESCRIPTION

TYPE <u>NA</u>	RISER PIPE MATERIAL <u>NA</u>
DIAMETER OF PERFORATED SECTION <u>NA</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>NA</u> I.D. <u>NA</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>NA</u>
AVERAGE SIZE OF PERFORATIONS <u>NA</u>	JOINING METHOD <u>NA</u>
TOTAL PERFORATED AREA <u>NA</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>NA</u>	OTHER PROTECTION <u>NA</u>
PROTECTIVE PIPE O.D. <u>NA</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ()	
TOP OF RISER PIPE	<u>NA</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>NA</u>			
BOREHOLE FILL MATERIALS: <u>Cement</u> GROUT/SLURRY BENTONITE SAND GRAVEL	Top	0.0	Bottom	1.0
	TOP	1.0	BOTTOM	33.0
	TOP	NA	BOTTOM	NA
	TOP	NA	BOTTOM	NA
	TOP	NA	BOTTOM	NA
PERFORATED SECTION	TOP	NA	BOTTOM	NA
PIEZOMETER TIP	<u>NA</u>			
BOTTOM OF BOREHOLE	<u>33.0 ft</u>			
GWL AFTER INSTALLATION	<u>NA</u>			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES NO

REMARKS 0.0 - 1.0 ft. cement cap

RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>102-23-03-02</u>		PROJECT NAME: <u>Q12 Redrill</u>	
BORING NUMBER: <u>1850</u>		COORDINATES:	
ELEVATION:		DATE: <u>2/23/92</u>	
ENGINEER/GEOLOGIST: <u>D. O'BRIEN</u>		DATE STARTED: <u>2/23/92</u>	
DRILLING METHODS: <u>Hollow Stem Auger</u>		DATE COMPLETED: <u>2/23/92</u>	
		PAGE <u>1</u> OF <u>24</u>	

DEPTH (Feet)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 100mm	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	0985 67623	9	12	Very stiff, 10YR (6/6) Brownish yellow silty clay, no plasticity slightly moist	CI	3.5	H ₂ O = 40 ppm BS = 50 cpm
	0986 67624	6	18	Loose black silt, dry (fly ash)	MI	NA	
2	0987 67624	6	18	Medium dense black silt dry (fly ash)	MI	NA	H ₂ O = 0 ppm BS = 50 cpm
3	0988 67625	6	18	3.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 40 cpm
4	0989 67626	6	18	4.5 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 50 cpm
5	0990 67627	6	18	6.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 50 cpm
6	0991 67628	6	18	7.5 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 40 cpm
7	0992 67629	6	18	9.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 50 cpm
8	0993 67630	6	18	10.5 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 50 cpm
9	0994 67631	6	18	12.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 50 cpm

NOTES:
 Drilling Contractor: Penn Drill
 Drilling Equipment: _____
 Driller: Joe Bonille
Craig Coulter

SAA - same as above
 NA - not applicable

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 102.23.03.02	PROJECT NAME: 7112 KOPILL		
BORING NUMBER: 1850	COORDINATES:	DATE: 2/23/92	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 2/23/92
ENGINEER/GEOLOGIST: D. O'Riain	Depth	Date/Time	DATE COMPLETED: 2/23/92
DRILLING METHODS: Hollow Stem Auger	PAGE 2		OF 24:

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6.00) FT	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
11	0925 67630	9	18	10.5 FT Medium Dense black silty clay (fly ash)	MI	NA	H ₂ O = 0 ppm BS = 60 cpm
12	0926 67631	9	18	11.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 60 cpm
13	0927 67632	9	18	11.5 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 60 cpm
14	0928 67633	9	18	12.0 FT SAA	MI	NA	H ₂ O = 0 ppm BS = 60 cpm
15	0929 67633	7	7	15.0 FT D50 2/23/92 Very stiff, 2.5H (1/2) Light olive gray silty clay low plasticity, slightly moist	CI	275	H ₂ O = 0 ppm BS = 50 cpm
16	0930 67634	4	10	16.5 FT SAA	CI	2.25	H ₂ O = 0 ppm BS = 60 cpm
17	0931 67635	5	10	18.0 FT SAA, med. stiff	CI	.75	H ₂ O = 0 ppm BS = 60 cpm
18	0932 67636	1	10	17.5 FT End boring 19.5 ft			

NOTES:

Drilling Contractor: Denn Drill
 Drilling Equipment: _____
 Driller: Joe Barile
Chris Conner

SAA - same as above
 NA - not applicable
 Ckcd: H₂O = 0 ppm
 BS = 40-60 cpm

30/L

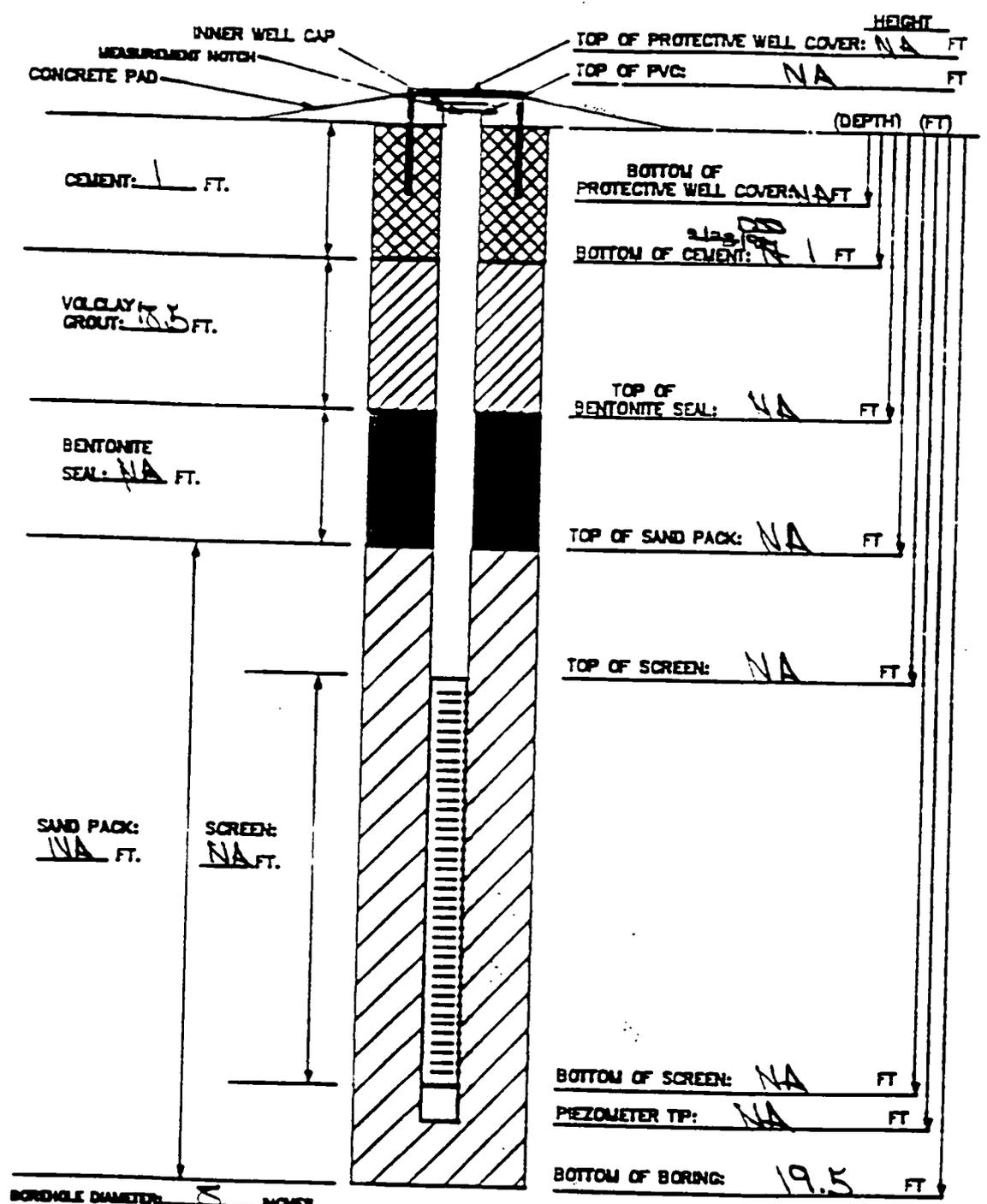
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FERNALD RI/FS

INSTALLATION DATE: 2/23/92

INSTALLATION DIAGRAM
MONITORING WELL NO.

1850



MATERIALS USED:

- SAND TYPE AND QUANTITY:
- BENTONITE PELLETS (5-GALLON BUCKETS):
- BAGS OF VOLCLAY GROUT: 1.5
- AMOUNT OF CEMENT: 3000
- AMOUNT OF WATER USED: 900
- OTHER: 200

NOTES:

- 1) RUBBER PIPE IS 2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.
- 2) SCREEN IS 2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.
- 3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SLIP.
- 4) WATER DEPTH/DATE:
- 5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER FLUG AND PADLOCK.
- 6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

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TASK: 602.20.03.02 GEOLOGIST/ENGINEER: D. O'BRUN

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS FLMP FIELD ENG./GEO. D. O'Neil DATE 2/23/92
 PROJECT NO. 9602-3.22 CHECKED BY C. Gault DATE 2/27/92
 BORING NO. 1850
 PIEZOMETER NO. NA DATE OF INSTALLATION 2/23/92

BOREHOLE DRILLING

DRILLING METHOD <u>Hollow Stem Auger</u>	TYPE OF BIT <u>NA</u> <u>Auger</u>
DRILLING FLUID(S) USED:	CASING SIZE(S) USED:
FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>
FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

PIEZOMETER DESCRIPTION

TYPE <u>NA</u>	RISER PIPE MATERIAL <u>NA</u>
DIAMETER OF PERFORATED SECTION <u>NA</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>NA</u> I.D. <u>NA</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>NA</u>
AVERAGE SIZE OF PERFORATIONS <u>NA</u>	JOINING METHOD <u>NA</u>
TOTAL PERFORATED AREA <u>NA</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>NA</u>	OTHER PROTECTION <u>NA</u>
PROTECTIVE PIPE O.D. <u>NA</u>	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ()	
TOP OF RISER PIPE	<u>NA</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>NA</u>			
BOREHOLE FILL MATERIALS: <u>Cement</u> GROUT/SLURRY BENTONITE SAND GRAVEL	TOP	0.0	Bottom	1.0
	TOP	1.0	BOTTOM	19.5
	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
PERFORATED SECTION	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
PIEZOMETER TIP	<u>NA</u>			
BOTTOM OF BOREHOLE	<u>19.5</u>			
GWL AFTER INSTALLATION	<u>NA</u>			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES NO 119
 REMARKS 0.0 - 1.0 ft. cement cap

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.20.03.02	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1888	COORDINATES:	DATE: 2-23-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 2-23-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 2-23-92
DRILLING METHODS: 8" Hollow Stem Auger	PAGE 1	OF 24

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 in. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	67714	8		Very stiff light olive brown (2.5Y, 5/4) GRAVELLY CLAY with Sand and organic matter (i.e. rat stems), medium plasticity, slightly moist	CL	4.0	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm TAL "B"
	1350	15	14				
	2-23-92	27					
1.5	67715	13		Very stiff light olive brown (2.5Y, 5/3) GRAVELLY CLAY with Sand, a little Yellowish Brown (10YR, 5/6) weathering, and trace organic matter, medium plasticity, slightly moist	CL	4.0	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Archive
	1355	28	15				
	2-23-92	47					
3.0	67716	13		Stiff olive (5Y, 5/3) GRAVELLY CLAY with Sand, medium plasticity, moist	CL	1.5	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Archive
	1402	10	12				
	2-23-92	16					
4.5	67717	8		Medium stiff olive gray (5Y, 5/2) CLAY with sand and gravel, trace organic matter, a piece of string, medium plasticity, Very moist	CL	1.0	H _{nu} = 0 ppm B _r = 400 cpm α = 0 cpm EXT. HSL + APP IX (TAL "C") Samples taken from 5.0 - 6.0 ft.
	1438	5	18				
	2-23-92	8					
6.0	67718	8		Very stiff Very dark brown (5Y, 2.5/1) (10YR, 2/2): k.m. 2-23-92 CLAY, low plasticity, slightly moist	CL	325	H _{nu} = 0 ppm B _r = 300 cpm α = 0 cpm Full RAD + TOC (TAL "C") TCLP: VOC/SVOC (TAL "A")
	67719		18				
	1451	13	19				
7.5	2-23-92	19					

NOTES: Drilling Company: Pennsylvania Drilling
 Driller: Dave Neumann
 Assistant Driller: Mark Rebold

Samples collected Per ASTM Standard Penetration Test
 colors identified using Munsell color chart

USina 3" Split Spoons

H_{nu} S/N: 1185 } 0 ppm } Background Levels
 B_r S/N: 50760 } 100 cpm }
 α S/N: 50768 } 0 cpm }

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VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 60220.03.02	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 1888	COORDINATES:	DATE 2-23-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 2-23-92
ENGINEER/GEOLOGIST: Ken Mavon	Depth Date/Time	DATE COMPLETED: 2-23-92
DRILLING METHODS: 2" Hollow Stem Auger	PAGE 2	OF 24

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN. RECOVERY (N ₆₀)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USC)	REMARKS
7.5	67720 1540 2-23-92	16 18 21	18 Stiff Black (SY, 2.5/1) CLAY with trace sand and organic matter, low plasticity, slightly moist	CL	2.0	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Archive
9.0	67721 1600 2-23-92	14 15 22	18 Very stiff mottled gray (SY, 5/1) and yellowish brown (10YR, 5/8) CLAY, high plasticity, moist	CL	2.5	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Archive
10.5	67722 67723 1630 2-23-92	11 14 18	18 Stiff mottled gray (SY, 5/1) and yellowish brown (10YR, 5/8) CLAY, medium plasticity, moist trace wood fragments, piece of string, medium plasticity, moist	CL	1.75	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Fill/soil interface Archive
11.75	2-23-92		stiff Very dark gray (SY, 3/1) CLAY, high plasticity, slightly moist	CL	1.75	Archive EXT. HSL/Screen (TAL"8")
12.0	67724 67725 1720 2-23-92	9 9 11	18 Stiff light olive brown (2.5Y, 5/4) CLAY with yellowish brown (10YR, 5/8) and olive gray (5Y, 5/2) mottling and trace sand, high plasticity, moist	CL	2.0	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm TOC (TAL"8") Archive
13.5	67726 1730 2-23-92	11 10 17	18 Same As Above	CL	2.0	H _{nu} = 0 ppm B _r = 100 cpm α = 0 cpm Archive
15.0						

NOTES

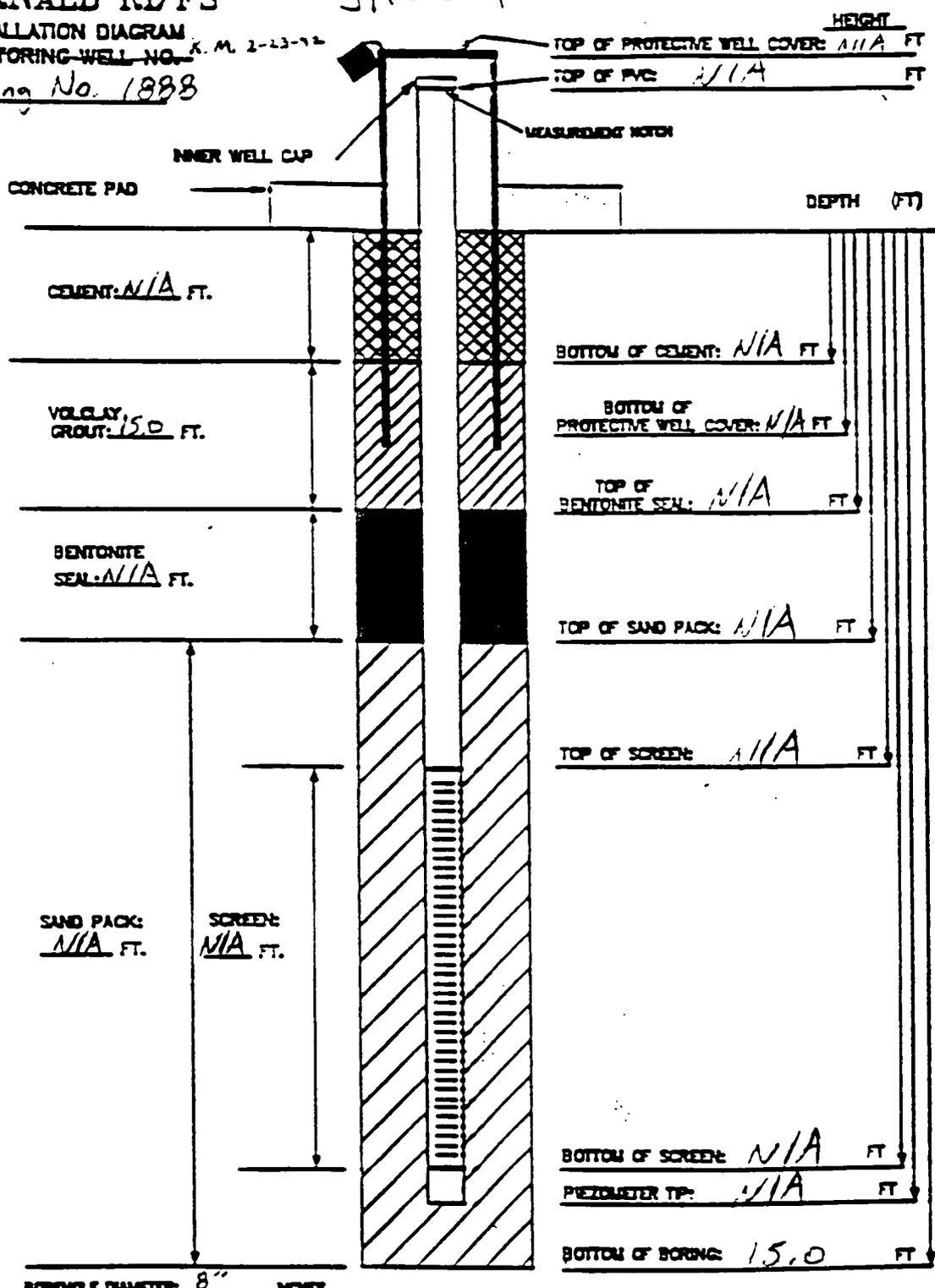
Bottom of Bore Hole at 150 ft.

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO. K.M. 2-23-92
Boring No. 1888

Stickups

INSTALLATION DATE: 2-23-92



MATERIALS USED:
 SAND TYPE AND QUANTITY: N/A
 BENTONITE PELLETS (5-GALLON BUCKETS): N/A
 BAGS OF VOLCLAY GROUT: 1 Bag
 AMOUNT OF CEMENT: N/A
 AMOUNT OF WATER USED: 25 gallons
 OTHER: N/A

- NOTES:**
- 1) BOREHOLE IS 2-INCH DIAMETER W/ PVC-PVC TUBING-DRILLED HORIZ.
 - 2) SCREEN IS 2-INCH I.D. SCREENED W/ PVC-PVC TUBING-DRILLED HORIZ.
 - 3) LOWER END OF SCREEN IS CAPED WITH 1/2-INCH O.D. OR THERMO-SEAL.
 - 4) BORE DEPTH/DATE: N/A

TASK: 602.200302

GEOLOGIST/ENGINEER: Ken Maries

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEAMP RI/FS FIELD ENG./GEO. Ken Marion DATE 2-23-92
 PROJECT NO. 002, 20, 03, 02 CHECKED BY [Signature] DATE 3/2/92
 BORING NO. 1888
 PIEZOMETER NO. _____ DATE OF INSTALLATION 2-23-92
K.M. 2-23-92
BOREHOLE DRILLING

DRILLING METHOD <u>2" Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog</u>
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

PIEZOMETER DESCRIPTION

TYPE <u>N/A</u>	RISER PIPE MATERIAL <u>N/A</u>
DIAMETER OF PERFORATED SECTION <u>N/A</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>N/A</u> = <u>N/A</u>
SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>N/A</u>
AVERAGE SIZE OF PERFORATIONS <u>N/A</u>	JOINING METHOD <u>N/A</u>
TOTAL PERFORATED AREA <u>N/A</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>N/A</u>	OTHER PROTECTION <u>N/A</u>
PROTECTIVE PIPE O.D. <u>N/A</u>	

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (ft)		ELEVATION (ft)	
TOP OF RISER PIPE	<u>N/A</u>		<u>N/A</u>	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>N/A</u>		<u>N/A</u>	
BOREHOLE FILL MATERIALS:				
GROUT / SLURRY	TOP <u>0.0</u>	BOTTOM <u>15.0</u>	TCP	BOTTOM
BENTONITE	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
SAND	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
GRAVEL	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
PERFORATED SECTION	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
PIEZOMETER TIP	<u>N/A</u>		<u>N/A</u>	
BOTTOM OF BOREHOLE	<u>15.0</u>			
GWL AFTER INSTALLATION	<u>N/A</u>		<u>N/A</u>	

IS THE PIEZOMETER FLUSHED AFTER INSTALLATION? N/A YES NO
 IS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? N/A YES NO

REMARKS Replacemg Km. 2-23-92

Replacement Boring for 1721 & 1722 123

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER 62.20.03.02	PROJECT NAME FEMP RT/FS	
BORING NUMBER: 1989	COORDINATES:	DATE 2-25-92
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 2-25-92
ENGINEER/GEOLOGIST: Ken Marino	Depth Date/Time	DATE COMPLETED: 2-25-92
DRILLING METHODS: 2" Hollow Stem Auger	PAGE 1	OF 85

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN RECOVERY (10)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (15)	REMARKS
0	67730 5 13 02/25/92	15	very stiff (10 yr old) yellowish brown silty clay, some sand & fine to coarse gravel, low plasticity, slightly moist root stems	CL	2.5	H ₂₅ = 0 ppm B ₂₅ = 100 cpm α = 0 cpm
1.5	67731 16 1357 19 02/25/92	15	Very stiff (10 yr, s/b) yellowish brown silty clay, some sand and gravel, trace organic matter (wood & root stems) piece of gravel size black (5, 25/1)	CL	3.5	H ₂₅ = 0 ppm B ₂₅ = 100 cpm α = 0 cpm
3.0	67732 10 1404 ? 2-25-92	10	Stiff (2.5 x 4/4) olive brown sandy clay, some fine to coarse gravel, trace silt, some orange weathering, medium plasticity, moist (wood)	CL	1.25	H ₂₅ = 0 ppm B ₂₅ = 120 cpm α = 0 cpm
4.5	67733 8 1430 6 2-25-92	18	medium stiff (5 x 4/2) olive gray gravelly clay, some sand, trace grayish brown matter, trace organics (ie roots & wood) medium plasticity, moist	CL	.75	H ₂₅ = 0 ppm B ₂₅ = 100 cpm α = 5 cpm
6.0	67734 8 1450 11 2-25-92	18	Soft (2.5 x 4/3) olive silty clay, some sand and fine to coarse gravel, trace grass and roots medium plasticity, moist	CL	.5	H ₂₅ = 0 ppm B ₂₅ = 90-100 cpm α = 0 cpm
7.5			Very stiff (5 x 3/1) very dark gray silty clay trace of organic matter, low plasticity, to name	CL	3.5	

NOTES: Drilling Company: Pennsylvania Drilling
 Driller: Dave Newman
 Assistant Driller: Mark Rebold
 Help/SSC: Sunde, D. Smith

Samples collected for ASTM Standard Penetration Test
 Colors Identified using Munsell Color Chart

71111 H₂₅ = 0 ppm } Background
 50760 B₂₅ = 100 cpm } Levels
 50768 α = 0 cpm } 124

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER	602-20.03.02	PROJECT NAME	FE MP RI/FS
BORING NUMBER:	1889	COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST	Ken MacLennan	Depth	Date/Time
DRILLING METHODS:	9" Hollow Stem Auger		
		PAGE	2 OF 85

DEPTH FT	SAMPLE TYPE & NO	BLOWNS ON SAMPLER 16 IN 1	RECOVERY IN 1	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (115%)	REMARKS
7.5	67735	19		Very stiff (5Y 3/1) very dark gray silty clay, trace organic matter, medium plasticity, moist	CL	2.5	H _N U = 0 ppm β _S = 100 cpm α = 0 cpm
	1513	22	18				
	2-25-92	26					
9.0	67736	16		Stiff (5Y 4/2) olive gray silty clay with (2.5Y 5/4) yellowish brown mottling medium to high plasticity, moist	CL	3.0	
	1526	18	18	Stiff mottled (5Y 5/1) gray to (10YR 5/6) yellowish brown very silty clay, trace organic matter, low to medium plasticity, moist	CL	2.0	H _N U = 0 ppm β _S = 80-100 cpm α = 0 cpm
	1546	15	18				
	2-25-92	21					
10.5	67737	10		Stiff mottled (5Y 6/1) gray to (10YR 5/6) yellowish brown very silty clay, trace organic matter, low plasticity, moist	CL	2.0	H _N U = 0 ppm β _S = 80-100 cpm α = 0 cpm
	1546	15	18				
	2-25-92	17					
12.0	67738	17		Very stiff SAA	CL	2.25	H _N U = 0 ppm β _S = 100 cpm α = 0 cpm
	1607	15	18				
	2-25-92	14					
				medium stiff, 10YR 5/6 yellowish brown to (2.5Y 5/4) reddish brown silty clay to silty clay with trace organic matter	CL	1.0	
13.5	67739	8		Very stiff light olive brown (2.5Y, 5/6) silty clay and light gray (5Y, 6/1) silty clay with sand and trace organic matter, low plasticity, moist	CL	2.5	H _N U = 0 ppm β _S = 100 cpm α = 0 cpm
	1620	14	18				
	2-25-92	27	14.5				
15.0				Dense light olive brown (2.5Y 5/6) and light gray (5Y, 6/1) clayey silt with trace sand and fine gravel, moist	ML	N/A	14.5 ft. is the fill/till interface
NOTES ↓ 15.5							

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER	602.20.03.02	PROJECT NAME	FE.MP RE/FS
BORING NUMBER:	1889	COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST:	Ken Maclean/K. Maclean	Depth	Date/Time
DRILLING METHODS:	8" Hollow Stem Auger	PAGE	3 OF 85

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. (1)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (lb/in ²)	REMARKS
15.5	67740	32		Soft olive yellow (2.5Y, 6/6) SILTY CLAY with some sand, low plasticity, wet	CL	5	H ₂₅ = 0 ppm B ₂₅ = 100 cpm α = 0 cpm
16.0	78	24		Very stiff olive yellow (2.5Y, 6.8)			
16.5	1650	53		SILTY CLAY with some sand and a couple pieces of limestone cobbles, slightly moist, low plasticity	CL	4.0	RAD SCREEN TAL 20.03.02 B
17.5	2-2542	68					
				Bottom of Bore Hole			

NOTES

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FERNALD RI/FS

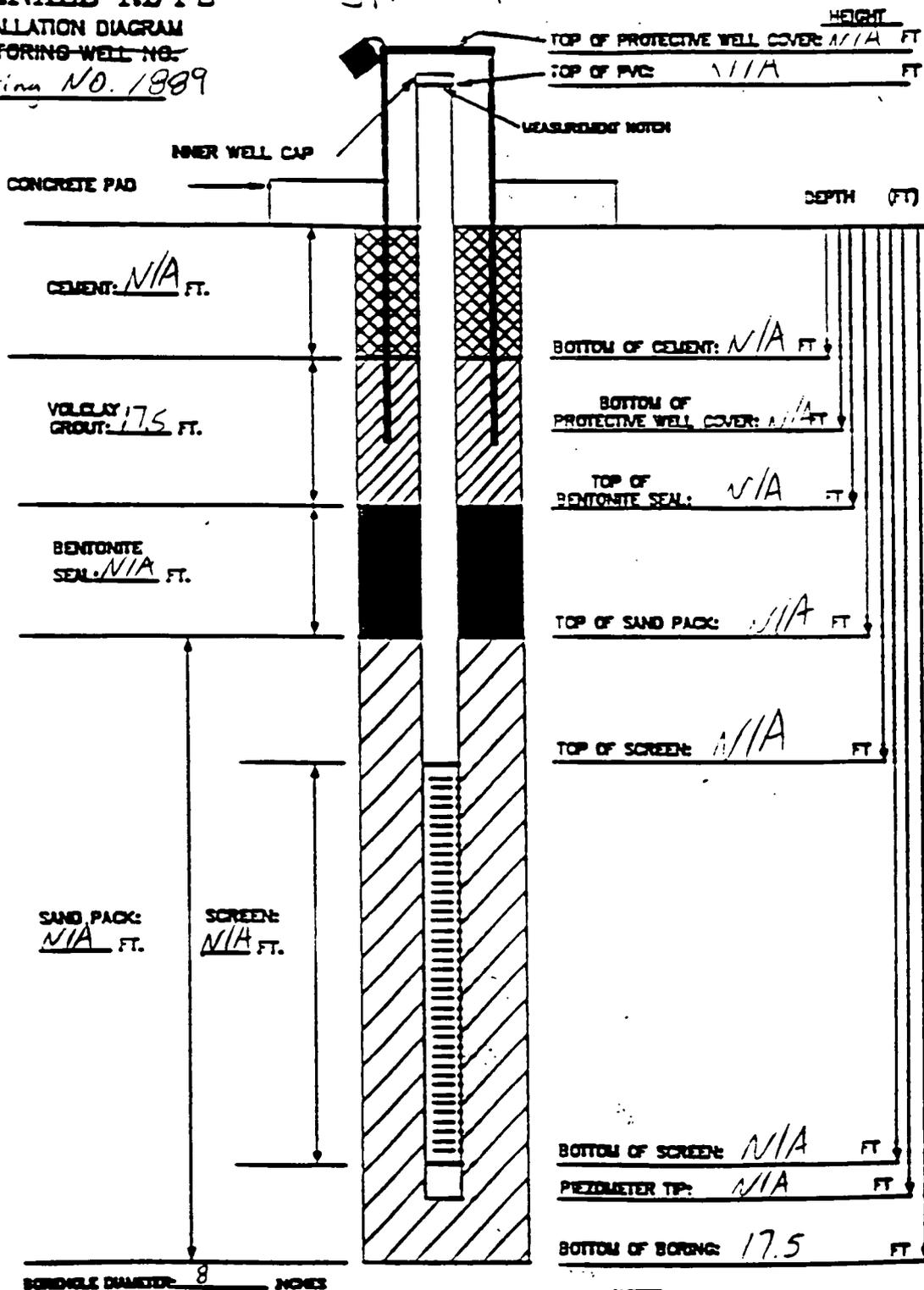
INSTALLATION DIAGRAM

MONITORING WELL NO. _____

Boring NO. 1989

Stick ups

INSTALLATION DATE: 2-25-92



MATERIALS USED:

SAND TYPE AND QUANTITY: N/A
 BENTONITE PELLETS (5-GALLON BUCKETS): N/A
 BAGS OF VOLCLAY GROUT: 1 Bag
 AMOUNT OF CEMENT: N/A
 AMOUNT OF WATER USED: 20 gallon
 OTHER: N/A

NOTES:

- 1) INNER PIPE IS 3" NON-SCHEDULE 40 K.M.
- 2) SCREEN IS 3" NON-SCHEDULE 40 2-25-92
- 3) LOWER END OF SCREEN IS OFFSET WITH
- 4) WATER DEPTH/DATE: N/A

TASK: 602.20.03.02 GEOLOGIST/ENGINEER: Ken

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. Ken Marston DATE 2-25-92
 PROJECT NO. 602.70.03.02 CHECKED BY P. ... DATE 2/25/92
 BORING NO. 1889
 PIEZOMETER NO. N/A DATE OF INSTALLATION 2-25-92

BOREHOLE DRILLING

DRILLING METHOD <u>8" Hollow Stem Auger</u>	TYPE OF BIT <u>Bull Dog</u>
DRILLING FLUID(S) USED: FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	CASING SIZE(S) USED: SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u> SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

PIEZOMETER DESCRIPTION

TYPE <u>N/A</u>	RISER PIPE MATERIAL <u>N/A</u>
DIAMETER OF PERFORATED SECTION <u>N/A</u>	RISER PIPE DIAMETERS: O.D. <u>N/A</u> I.D. <u>N/A</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>N/A</u>
AVERAGE SIZE OF PERFORATIONS <u>N/A</u>	JOINING METHOD <u>N/A</u>
TOTAL PERFORATED AREA <u>N/A</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>N/A</u>	OTHER PROTECTION <u>N/A</u>
PROTECTIVE PIPE O.D. <u>N/A</u>	<u>N/A</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT.)		ELEVATION (FT.)	
TOP OF RISER PIPE	<u>N/A</u>		<u>N/A</u>	
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>N/A</u>		<u>N/A</u>	
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP <u>0.0</u>	BOTTOM <u>17.5</u>	TOP	BOTTOM
BENTONITE	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
SAND	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
GRAVEL	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
PERFORATED SECTION	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP <u>N/A</u>	BOTTOM <u>N/A</u>
PIEZOMETER TIP	<u>N/A</u>		<u>N/A</u>	
BOTTOM OF BOREHOLE	<u>17.5</u>			
GWL AFTER INSTALLATION	<u>N/A</u>		<u>N/A</u>	

IS THE PIEZOMETER FLUSHED AFTER INSTALLATION? N/A YES NO
 IS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? N/A YES NO

REMARKS Reboring for 1888

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER <u>602.3 23</u>	PROJECT NAME <u>FEMP RI/FS</u>	DATE <u>1-28-92</u>
BORING NUMBER: <u>3678</u>	COORDINATES:	DATE <u>2-8-92 L.M.</u>
ELEVATION:	GWL: Depth <u>See p. 1</u> Date/Time	DATE STARTED: <u>1-27-92</u>
ENGINEER/GEOLOGIST: <u>Ken Marion</u>	Depth Date/Time	DATE COMPLETED: <u>1-19-92</u>
DRILLING METHODS: <u>Cable Tool 10" drill bit</u>		PAGE <u>4</u> OF <u>15</u>

DEPTH (ft.)	SAMPLE TYPE & NO	B. OWS ON SAMPLER PER '6 in.	RECOVERY (in.	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USCS)	REMARKS
22.5	38045 0130 1-28-92	5	6	Medium dense light gray (SY, 6/1) fine SAND with silt and clay, moist	SM	N/A	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm
23.0		7					
24.0		9					
24.8	38046 0940 1-28-92	8	10	Very stiff olive gray (SY, 5/2) SILTY CLAY with sand and fine gravel, moist, low plasticity	CL	3.0	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm
25.5		9					
26.6	38047 0950 1-28-92	5	13	Very stiff olive gray (SY, 5/2) CLAYEY SILT with sand and gravel, moist, low plasticity	ML	3.0	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm
27.0		11					
27.9	38048 1030 1-28-92	10	10	Medium dense light gray (SY, 6/1) CLAYEY SILT with fine sand, moist	ML	N/A	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm
28.5		9					
30.0	1044 1-28-92	1	0	No Recovery	N/A	N/A	N/A
		5					
		3					

NOTES

See p. 1

VISUAL CLASSIFICATION OF SOILS

3840

PROJECT NUMBER: 602.7.23	PROJECT NAME: FEMO PROJECT	
BORING NUMBER: 3678	COORDINATES:	DATE: 1-28-92
ELEVATION:	GWL: Depth sec. p. 1 Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Macion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit	PAGE 5 OF 15	

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISF)	REMARKS
30.0	1052 1-28-92	11 9 11	0	No Recovery	N/A	N/A	N/A
31.5	38049 1107 1-28-92	6 9 11	16	Very stiff olive (SY, 5/2) SILTY CLAY with sand and gravel, low plasticity, moist	CL 2.0		H _{nu} = 0.3 ppm Br = 15 cpm α = 0 cpm
32.8 33.0	38050 1324 1-28-92	3 5 5	13	Stiff olive (SY, 5/2) SILTY CLAY with sand and gravel, low plasticity, moist	CL 1.0		H _{nu} = 0.3 ppm Br = 15 cpm α = 0 cpm
34.1 34.5	38051 1336 1-28-92	38 28 16	10	Medium stiff olive gray (SY, 5/2) SILTY CLAY with sand and gravel, low plasticity, moist	CL 1.0		H _{nu} = 0.3 Br = 15 cpm α = 0 cpm
35.3 36	38052 1350 1-28-92	8 13 31	14	Very stiff olive gray (SY, 5/2) SILTY CLAY with sand and gravel, low plasticity, slightly moist	CL 3.0		H _{nu} = 0.3 ppm Br = 15 cpm α = 0 cpm
37.2 37.6	NOTES						

Sec. p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-3-23	PROJECT NAME: FEMP RT/FS	
RING NUMBER: 3678	COORDINATES:	DATE: 1-28-92
ELEVATION:	GWL: Depth: 22.0' Date/Time:	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marion	Depth: Date/Time:	DATE COMPLETED: 2-19-92
DILLING METHODS: Cable Tool 10" drill bit	PAGE 6 OF 15	

DEPTH (ft.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISI)	REMARKS
2.5	38053	13		Hard olive gray (5Y, 5/2) SILTY CLAY with sand and gravel, trace wood fragments, non plastic, slightly moist	CL	>4.5	H _{nu} = 0.3 ppm D _f = 15 cpm α = 0 cpm
3	1440	25	10				
3	1-28-92	31					
4.0	38054	13		Hard olive gray (5Y, 5/2) SILTY CLAY with sand and gravel, non plastic, slightly moist	CL	4.25	H _{nu} = 0.3 ppm D _f = 15 cpm α = 0 cpm
4	1456	11	11				
4	1-28-92	15					
5.0	38055	9		Very stiff olive gray (5Y, 4/2) SILTY CLAY with sand and gravel, low plasticity, slightly moist mixed with some dark brown (10YR, 3/3) CLAYEY SILT	CL/ML	2.0	H _{nu} = 0.3 ppm D _f = 15 cpm α = 0 cpm
5	1525	11	15				
5	1-28-92	13					
6.5	38056	9		Very stiff olive gray (5Y, 4/2) ^{dark brown (10YR, 3/3)} CLAYEY SILT with sand and gravel mixed with some olive gray (5Y, 4/2) SILTY CLAY, low plasticity, slightly moist	ML/CL	2.0	H _{nu} = 0.3 ppm D _f = 15 cpm α = 0 cpm
6.5	1530	15	9				
6.5	1-28-92	21					
7.5	38057	10		Very stiff olive gray (5Y, 5/2) SILTY CLAY with sand and gravel, trace wood fragments and fossils, low plasticity, slightly moist	CL	2.25	H _{nu} = 0.3 ppm D _f = 15 cpm α = 0 cpm
7.5	1543	11	18				
7.5	1-28-92	15					

See p. 1

VISUAL CLASSIFICATION OF SOILS

OBJECT NUMBER: 2.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE: 1-28-92
ELEVATION:	GWL: Depth See p. 1 Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marioni	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 7 OF 15

ft.	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
5.0	38058 1617 1-28-92	5 9 12	18	Very stiff olive gray (SY, 5/2) SILTY CLAY with sand and gravel, low plasticity, slightly moist	CL	2.0	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm *Bottom of glacial till at 46.5 FT
5.0	38059 1630 1-28-92	15 33 19	13	Very dense grayish brown (2.5Y, 5/2) GRAVELLY SAND, dry	SW	N/A	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm Aquifer
6.0	38060 1642 1-28-92	13 18 18	11	Dense grayish brown (2.5Y, 5/2) SAND with trace gravel, dry	SW	N/A	H _{nu} = 0.3 ppm B _r = 15 cpm α = 0 cpm
7.0				Split Spoon samples will be taken at 5ft. intervals			

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FERNALD RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE: 1-29-92
ELEVATION:	GWL: Depth sec 0.1 Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 1 1/2" drill bit		PAGE 8 OF 15

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
55.0	38061	48	11	Very dense grayish brown (2.5Y, 5/2) poorly graded Gravelly SAND, dry	GP	N/A	H _{max} = 0 ppm B _x = 15 cpm α = 0 cpm
55.9	0920	50					
56.5	1-29-92						
60.0	38062	10	12	Same As Above	GP	N/A	H _{max} = 0 ppm B _x = 15 cpm α = 0 cpm
61.0	1040	50					
61.5	1-29-92						
65.0	38063	31	12	Very dense grayish brown (2.5Y, 5/2) poorly graded medium SAND, dry	SW	N/A	H _{max} = 0 ppm B _x = 15 cpm α = 0 cpm
66.0	1340	50					
66.5	1-29-92						
70.0							

NOTES:

See p. 1

H_{max} S/N: A11336 } 0 ppm } Background Level
 B_x S/N: 50760 } 15 cpm }
 α S/N: 50764 } 0 cpm }

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE: 1-29-92
ELEVATION:	GWL: Depth see p. 1 Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit	PAGE 9 OF 15	

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
70.0	38064 1415 1-29-92	5 11 32	18	Dense grayish brown (2.5Y, 5/2) poorly graded medium SAND, dry	SP	N/A	H ₂ O = 0 ppm BT = 15 cpm α = 0 cpm
71.5							
75.0	38065 1532 1-29-92	32 50	12	Very Dense grayish brown (2.5Y, 5/2) poorly graded medium SAND with a little coarse sand and gravel, wet	SP	N/A	H ₂ O = 0 ppm BT = 15 cpm α = 0 cpm
76.0							
76.5							
80.0	38066 1640 1-29-92	8 15 13	18	Medium dense olive gray (5Y, 5/2) well graded SANDY GRAVEL, wet	GW	N/A	H ₂ O = 0 ppm BT = 15 cpm α = 0 cpm
84.5							W.L. = 80.85 ft. 02/20/92 ↑
95.0							

95 FT. interval

NOTES: See p. 1

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W.L. = Water Level.
Below Ground
Surface 3/21/92
at top of casing

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS
BORING NUMBER: 3678	COORDINATES: DATE: 1-30-92
ELEVATION:	GWL: Depth see p. (Date/Time) DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marins	Depth Date/Time DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit	PAGE 10 OF 15

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 in. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (11%)	REMARKS
85.0	38067 0940 1-30-92	8 33 36	13	Very dense olive gray (SY, 5/2) well graded SANDY GRAVEL	GW SW N/A	H _{nu} = .3 ppm B _r = 15 cpm c = 0 cpm	
90.0	38068 1000 1-30-92	8 12 16	18	Medium dense olive gray (SY, 5/2) medium SAND, trace fine gravel, wet	SP N/A	H _{nu} = .3 ppm B _r = 15 cpm c = 0 cpm	
95.0	38067 1105 1-30-92	21 33 39	18	Very dense olive gray (SY, 5/2) well graded SAND, trace gravel, wet	SW N/A	H _{nu} = .3 ppm B _r = 15 cpm c = 0 cpm	

NOTES

See. p. 1

1-30-92

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H_{nu} SN: Ad336 | 0.3 ppm } Background Level
 B_r SN: 50760 | 15 cpm }
 c SN: 50768 | 0 cpm }

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE: 1-30-92
ELEVATION:	GWL: Depth <u>see p. 1</u> Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit	PAGE 11	OF 15

DEPTH ft.	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6 IN. 1	RECOVERY (in. 1)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY II SF1	REMARKS
100.0	38070 1400 1-30-92	7 13 23	11	Dense olive gray (SY, 5/2) poorly graded coarse SAND with a little fine gravel, wet	SP	N/A	H ₂ O = .3 ppm Br = 15 cpm α = 0 cpm
101.5							
105							
105.5	38071 1640 1-30-92	8 22 33	15	Medium dense olive gray (SY, 5/2) well graded SAND, wet Very stiff olive (SY, 4/3) and Gray (2, SY, 5/0) clay, low plasticity, slightly moist	SW CL	N/A N/A	H ₂ O = .3 ppm Br = 15 cpm α = 0 cpm
106.5							
110.0	38072 1040 1-31-92	5 5	18	Very stiff gray (2, SY, 5/0) SANDY CLAY with gravel, high plasticity, moist	CL	2.25	H ₂ O = .2 ppm Br = 15 cpm α = 0 cpm
111.5							
115.0							

NOTES

See p. 1

1-31-92

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H₂O = .2 ppm } Background
Br = 15 cpm } Levels
α = 0 cpm }

**FERNALD
RI/FS**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-3-23	PROJECT NAME: FEMP RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE: 2-3-92
ELEVATION:	GWL: Depth ^{see} p. 1 Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Merion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit	PAGE 12 OF 15	

DEPTH ft.	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 6" (1)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
115.0	38073 1044	12 33	10	Hard olive (5Y, 5/4) CLAY with trace fossils including bryozoans, non plastic, slightly moist	CL	>4.5	H _{nu} = .2 ppm B _r = 15 cpm α = 0 cpm
116.5	2-3-92	50					
120.0	38074 1415	5 7	5	Medium dense light yellowish brown (2.5Y, 6/4) CLAYEY SAND with gravel, slightly moist	SC	N/A	H _{nu} = .2 ppm B _r = 15 cpm α = 0 cpm
121.5	2-3-92	9					
125.0	38075 1715	10 5	0	No Recovery	N/A	N/A	N/A
126.5	2-3-92	3					
130.0							

NOTES:

See p. 1

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-3-23	PROJECT NAME: FERNALD RI/FS	
BORING NUMBER: 3678	COORDINATES:	DATE 2-4-92
ELEVATION:	GWL: Depth <small>See p.1</small> Date/Time	DATE STARTED: 1-27-92
ENGINEER/GEOLOGIST: Ken Marion	Depth Date/Time	DATE COMPLETED: 2-19-92
DRILLING METHODS: Cable Tool 10" drill bit		PAGE 13 OF 15

DEPTH (ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN. 1	RECOVERY (in.)	DESCRIPTION	USGS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
130.0	38076 0915 2-4-92	33 50/2	5	Very dense light yellowish brown (2.5Y, 6/4) Fine gravel, slightly moist Gray (2.5Y, 5/0) Shale	GP SH	N/A N/A	H _{nu} = 0.2 ppm BT = 15 cpm α = 0 cpm
131.5				Drilled through this zone			
132.0	38077 1040 2-4-92	50/3	4	Gray (2.5Y, 5/0) Shale (Bedrock)	SH	N/A	H _{nu} = 0.2 ppm BT = 15 cpm α = 0 cpm
133.5				Bottom of Bore Hole = 132 ft. Bottom of split spoon sampling = 132.3 ft.			

NOTES

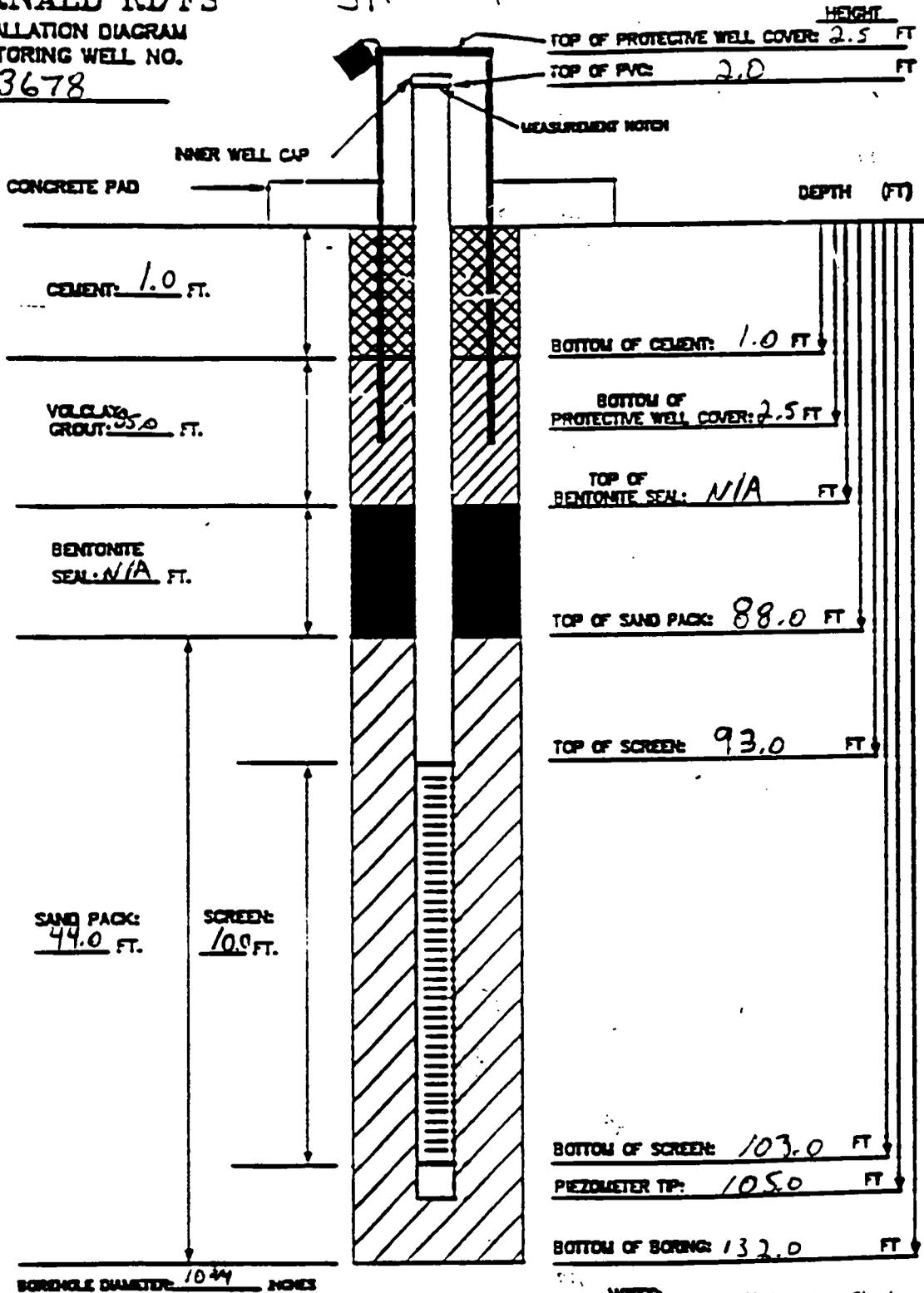
See p. 1

SH (USGS SYMBOL) = Shale Bedrock

INSTALLATION DATE: 2-19-92

FERNALD RI/FS
INSTALLATION DIAGRAM
MONITORING WELL NO.
3678

Stickups



MATERIALS USED:

- SAND TYPE AND QUANTITY: 430 SAND, 26 Bags
- BENTONITE PELLETS (5-GALLON BUCKETS): 5
- BAGS OF VOLCLAY GROUT: 19
- AMOUNT OF CEMENT: 1/2 bag
- AMOUNT OF WATER USED: 800 gallons
- OTHER:

NOTES:

- 1) INNER PIPE IS 4" Stainless Steel
- 2) SCREEN IS 2" DIA. 10-20 MESH
- 3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SLIP.
- 4) WATER DEPTH/DATE: 80.85/2-20-92

TASK: 602.3.23

GEOLOGIST/ENGINEER: Ken Marston

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEMP RI/FS FIELD ENG./GEO. Ken Marion DATE 2-20-
 PROJECT NO. 802-3-23 CHECKED BY C. Hanks DATE 3/2/92
 BORING NO. 3678
 PIEZOMETER NO. N/A DATE OF INSTALLATION 2-19-92

BOREHOLE DRILLING

DRILLING METHOD <u>Cable Tool</u>	TYPE OF BIT <u>10" Churn Bit</u>
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID <u>Water</u> FROM <u>0</u> TO <u>132.0</u>	SIZE <u>10 3/4</u> FROM <u>0</u> TO <u>132.0</u>
FLUID <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>	SIZE <u>N/A</u> FROM <u>N/A</u> TO <u>N/A</u>

PIEZOMETER DESCRIPTION

TYPE <u>Stainless Steel</u>	RISER PIPE MATERIAL <u>3/16 Stainless Steel</u>
DIAMETER OF PERFORATED SECTION <u>4.0 in. T.D.</u>	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. <u>4 3/8 in.</u> I.D. <u>4.0 in.</u>
SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>12.0 FT. 5.0 FT.</u>
AVERAGE SIZE OF PERFORATIONS <u>.010 in.</u>	JOINING METHOD <u>flush Joint Threaded</u>
TOTAL PERFORATED AREA <u>10 sq. ft.</u>	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 ft.</u>	OTHER PROTECTION <u>Steel Well</u>
PROTECTIVE PIPE O.D. <u>10 3/4 in.</u>	<u>Cover with lock</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft.)		ELEVATION (ft.)	
TOP OF RISER PIPE	2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS: <u>CEMENT GROUT/SLURRY</u> <u>BENTONITE pellets (Hydrostat)</u> <u>SAND</u> <u>GRAVEL</u>	TOP 0.0	BOTTOM 1.0		
	TOP 3.0	BOTTOM 88.0	TCP	BOTTOM
	TOP 10	BOTTOM 30	TCP	BOTTOM
	TOP 88.0	BOTTOM 132.0	TOP	BOTTOM
	TOP N/A	BOTTOM N/A	TOP N/A	BOTTOM N/A
PERFORATED SECTION	TOP 93.0	BOTTOM 103.0	TOP	BOTTOM
PIEZOMETER TIP	105.0			
BOTTOM OF BOREHOLE	132.0			
GWL AFTER INSTALLATION	80.85 to top of casing 2/20/92			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES NO
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES NO

REMARKS The temporary casing was removed during the installation of the well