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CONSOLIDATED CONSENT AGREEMENT/ FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT PERIOD ENDING JULY 31, 1991

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CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Introduction

The Consent Agreement (CA) under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Sections 120 and 106(a) and the Federal Facility Compliance Agreement (FFCA) between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (U.S. EPA), signed April 9, 1990 and July 18, 1986, 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 Feed Materials Production Center (FMPC) during the period July 1 through July 31, 1991 and planned actions for the period August 1 through August 31, 1991.

Highlights of work completed in July by the DOE includes the following:

- Test well installation for Part 1 of the South Groundwater Contamination Plume Removal Action was initiated on July 18, 1991.
- A major milestone for Removal Action 1 "Pumping and Treatment of the Plant 6 Perched Groundwater" system became operational on July 23, 1991.
- The draft Treatability Study Work Plan for Operable Unit 4 was submitted to the U.S. EPA on July 23, 1991.
- The draft Treatability Study Work Plan for Operable Unit 1 was submitted to the U.S. EPA on July 26, 1991.

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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 - 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 FMPC during July 1991. Information is presented for each of the removal actions identified in the Consent Agreement and the four recently agreed upon Removal Actions:

- o RA No. 1, Contaminated Water Beneath FMPC Buildings.
- o RA No. 2, Waste Pit Area Runoff Control.
- o RA No. 3, South Groundwater Contamination Plume.
- o RA No. 4, Silos 1 and 2.
- o RA No. 5, K-65 Decant Sump Tank.
- o RA No. 6, Waste Pit 6 Residues.
- o RA No. 7, Outfall Pipeline Replacement (Previously Outfall Pipeline Investigation and Repair).
- o RA No. 8, Plant 1 Pad Continuing Release.

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RA No. 1, Contaminated Water Beneath FMPC Buildings

Plant 6 - Pumping and collection of the perched water from underneath Plant 6 began on May 31, 1991. Consistent with the U.S. EPA modifications to the Plant 6 Perched Groundwater Removal Action Work Plan, the water will be treated prior to mixing it with other waste streams. Through the end of July, a total of 5800 gallons of water was collected, transported to and treated in Plant 8. The milestone for pumping and treatment of the Plant 6 perched water was completed on schedule.

Plants 2/3 and Plant 9 - The design work necessary to locate and design the extraction and treatment systems specified by the approved work scope continued on schedule. Engineering activities associated with the detailed design and procurement of piping and equipment to support the removal and treatment of contaminated perched water beneath Plant 9, Plants 2/3, and Plant 8 are underway. The 90% complete design drawings and specifications for Plants 2/3 and 9 extraction systems arrived from the Architect/Engineer (A/E) in early May. The Certified For Construction (CFC) drawings were completed in mid-June. During July, measurable progress was made with the mechanical and electrical work at Plant 9.

Activities in August will focus on the installation of a new 4 inch extraction well outside the southeast corner of Plant 9. This extraction well, along with the completion of a piping system for the two Plant 9 wells and the start-up of the Plant 9 extraction system, is on schedule. Pumping from Plant 9 will begin on August 20, 1991.

Plant 8 - The startup date for the treatment system was July 24, 1991. The carbon absorption treatment system in Plant 8 will be used to treat the perched groundwater from Plants 2/3, 6, 8, and 9. Through the end of July, two batches (2900 gallons each) were collected, transported, and treated utilizing the Plant 8 facilities. The milestone for startup of the Plant 8 treatment system was completed.

All activities are on schedule to support the deliverables identified in the three U.S. EPA approved Removal Action Work Plans.

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RA No. 1, Contaminated Water Beneath FMPC Buildings (cont'd.)

KEY MILESTONES	STATUS	DUE DATE
Pumping and treatment of the Plant 6 perched groundwater became operational.	Completed July 23, 1991	July 24, 1991
Initiate Pumping in Plant 9.	Open, on schedule.	August 20, 1991
Initiate Pumping in Plants 2/3 and 8.	Open, on schedule.	November 1, 1991

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 and conditional approval was received from the Ohio EPA on April 2, 1991.

A modified Sampling and Analysis Plan and a revised schedule based on the conditions and modifications imposed/made to the project were submitted to the U.S. EPA and the Ohio EPA on May 14, 1991.

In order to satisfy one of the conditions stipulated by the U.S. EPA for the approval of the Waste Pit Area Runoff Control EE/CA, Permeability Studies in the Waste Pit Area were initiated. These tests were to determine if the clays in the detention area could meet the required maximum permeability of 1×10^{-7} cm/sec. Laboratory analysis of the results from the permeability testing in the north and east detention areas indicated permeability in the range of 1×10^{-7} cm/sec. However, field studies showed permeability factors as high as 1×10^{-3} cm/sec. Due to these results, modifications to the design have been initiated in the detention areas.

Construction activities were initiated on June 6, 1991 with the issuance of the construction work order to Rust Engineering. The results of the pre-excavation soil sampling indicated additional sampling and analysis will be required in some areas to further characterize the nature and extent of Hazardous Substance List (HSL) materials contamination.

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

Planned activities in August include continuing the evaluation of the analytical results of the pre-excavation samples and the continuation of excavation activities.

KEY MILESTONES	STATUS	DUE DATE
Initiation of Bid/Award construction activities with issuance of the construction work order.	Completed. June 6, 1991.	June 1991
Completion of construction/ system testing (system operational).	Open, on schedule.	July 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. The Ohio EPA approved the Work Plan for Part 1 provided that two comments were satisfactorily resolved. Responses to these comments are being prepared. The U.S. Army Corps of Engineers (COE) reached an agreement with the owner of the property where the Part 1 test well is to be installed. The Ohio EPA inspected the well field and found the site acceptable.

At the end of June, the COE had obtained Right of Entry from approximately half of the affected property owners where the alternate water supply mains are to be located. The Right of Entry allows surveying, exploration, and construction. The COE archaeologist completed a cultural resource investigation (archaeological/historical survey) of the Part 1 well site area and found no reason to delay the proposed well test activities. This information will be included in a report to be submitted to the Ohio State Historic Preservation Officer for all areas in the Part 1 South Groundwater Contamination Plume Removal Action that are affected by construction activities. Based on the COE findings, approval to proceed on the test well activities was granted by the DOE/FSO.

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

Part 1 (cont'd.)

Procurement of materials and mobilization for installation of the test well began on July 8, 1991 and drilling of the test well began on July 15, 1991. A decision was made to proceed on completing the 100% drawings and specifications for Part 1, assuming the results of the well field testing will be positive.

Part 2

Part 2 (pump from leading edge of South Plume and discharge to Great Miami River) and Part 3 (the installation and operation of an Interim Advanced Wastewater Treatment System [IAWWT] to reduce contaminant loading discharged to the Great Miami River to a level less than 1,700 pounds per year) were prepared as one Work Plan and submitted to the U.S. EPA on December 17, 1990. The Work Plan for Parts 2 and 3 of the South Plume Removal Action was disapproved by the U.S. EPA on January 17, 1991. The Ohio EPA comments were received on January 18, 1991.

The preliminary drawings for Part 2 were issued to the U.S. EPA for informational purposes on February 6, 1991.

A meeting was held on February 8, 1991 at the Ohio EPA Dayton office to discuss key comment items and FMPC's initial responses. The U.S. EPA did not attend the meeting. Several changes resulted from the meeting and were reflected in the revised Work Plan and responses to comments. The Ohio EPA stated that, based on the latest groundwater information discussed at a meeting held on February 1, 1991 at Advanced Sciences, Inc. (ASI) offices, relocation of the well field to the north should be considered.

A second meeting was held February 20, 1991 at the Ohio EPA Dayton office. The U.S. EPA and the Paddy's Run Road Site (PRRS) representatives were in attendance. A discussion on relocating the well field determined that, if possible, the well field should be moved north to minimize the impact on the PRRS plume. The Work Plan was revised to reflect an evaluation of this relocation.

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

Part 2 (cont'd.)

Due to the delay required to evaluate relocating the well field, the project was split into two construction packages. The first package, which is the most time consuming to construct, contains the transfer pump station, groundwater discharge pipeline, outfall pipeline, and associated appurtenances. The second package contains the well field details. Construction will be delayed on the well field package until the issues on the well field relocation are resolved.

A letter was issued to the U.S. EPA on February 15, 1991 entitled "Installation of a New Effluent Line and its Incorporation into the South Plume Removal Action." The letter summarized a recently completed study which indicated that the DOE would not attempt to repair the existing outfall pipeline but would instead replace the existing line with a new pipeline. The DOE also stated that a twenty-day extension was needed to make the necessary changes to the Work Plan to reflect this decision.

A revised work plan for Parts 2 and 3 of the South Plume Removal Action, which addressed the aforementioned items, was submitted to the U.S. EPA on March 11, 1991. The Work Plan was approved by the Ohio EPA on April 12, 1991 and by the U.S. EPA on April 26, 1991, provided that fifteen and two comments, respectively, were satisfactorily resolved.

A meeting was held with the U.S. EPA on May 22, 1991 to discuss the scope of work prepared to determine the location of the South Plume Removal Action Part 2 well field. After much discussion, it was determined that the well field could not be successfully installed near New Haven Road because of the organic contaminants in this area from the PRRS plume. Therefore, it was determined that the proposed well field and transfer pump station would be relocated north of the Albright & Wilson Americas' (AWA) facilities. However, a Part 5, in support of Part 2, would be added to the South Plume Removal Action to determine the exact relocation. Part 5 would include groundwater sampling to determine what portion of the greater-than 30 µg/l of total uranium is downstream of the well field and the boundary of the PRRS. The FSO will determine the impact of these changes on the project schedules and funding.

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

Part 2 (cont'd.)

The 100% Design Review drawings and specifications for Part 2 were issued on May 31, 1991. The design package was sent to the Ohio and U.S. EPAs for informational purposes on June 7, 1991. The design package did not reflect the May 22, 1991 decision to relocate the well field and transfer pump station.

The initial computer modeling required to relocate the Part 2 well field was completed in July 1991. A meeting was held with the U.S. EPA and the Ohio EPA on July 23, 1991 to discuss the results of the modeling. Draft findings were presented. High levels of uranium were predicted by the model to be discharged from the relocated well field. This prediction raised concerns that the equivalent mass resolution will be difficult to meet with the currently scheduled associated projects discussed at the meeting. All parties agreed that the well field be installed north of the industrial user, but the issue of equivalent mass will need to be addressed. The FSO will study options and another meeting will be held to discuss the results.

Part 3

The work plan for Part 3 (the installation and operation of an Interim Advanced Wastewater Treatment [IAWWT] System to reduce 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 as described above. The Design Basis Document for the IAWWT was issued to the U.S. EPA for informational purposes on March 19, 1991. Comments were received from the Ohio EPA on the IAWWT design basis document. Responses to the comments were issued on May 30, 1991. The IAWWT System will be handled as a two-part design: the trailer package, which includes the treatment system; and the Utilities Services package, which includes all utilities and support systems. The IAWWT trailer package specifications were finalized and issued for bid on May 16, 1991. The bids were received on June 6, 1991. The contract for the fabrication of the trailer package was awarded on June 21, 1991. The 100% drawings and specifications utility portion of the project were Certified for Construction (CFC) on June 28, 1991.

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

Part 4

Part 4 of the South Groundwater Contamination Plume Removal Action Work Plan involves groundwater monitoring and institutional controls. Homeowner wells continue to be sampled on a monthly basis along Route 128 where previous above-background levels of uranium have been detected. Uranium concentrations in these homes are not increasing. Sampling of other homeowner and RI/FS wells continued.

Part 5

A work plan for Part 5 (Groundwater Modeling and Geochemical Investigation Selected Relocation of the South Plume Well Field) was prepared and submitted to the U.S. EPA for review on June 4, 1991. Comments were received from the Ohio EPA on June 25, 1991 and from the U.S. EPA on July 3, 1991. Per agreement at the July 23 meeting between the DOE, the U.S. EPA, and the Ohio EPA, the scope of the Part 5 field investigation is being expanded to include investigation of the area north and inclusive of the relocated Part 2 extraction well field.

Summary

Work in July included the approval of the Part 1 well field testing scope of work, Cost Account Plan, subsequent mobilization and start of installation of the Part 1 test well, computer modeling to determine the location of the relocated Part 2 well field, meeting with the U.S. and Ohio EPAs to discuss results and concerns raised by the computer modeling of the Part 2 Well Field, preparing the Part 3 Utilities Package for bid, and preparing responses to comments on the Part 5 Work Plan.

Activities in August will focus on completing the installation of the Part 1 test well and performing the testing of the well field, completing the 100% drawing and specifications for the Part 1 water supply, determining the changes required due to the relocation of the Part 2 well field and transfer pump station to the south side of the industrial user, further evaluation of the equivalent mass uranium concern raised by relocation of the Part 2 well field, issuance of the bid package for the Part 3 Utilities Services design package, obtaining National Environmental Policy Act's (NEPA) approval for Parts 2/3, completing and submitting responses to the U.S. and Ohio EPAs' comments on the Part 5 Work Plan, obtaining access to the Part 5 study area, and performing a cultural resource investigation of the Part 5 study area.

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

Summary (cont'd.)

KEY MILESTONES	STATUS	DUE DATE
Complete Part 1 (Alternate Water Supply)	Open	December 1991
Complete Parts 2 and 3 (Extraction wells, force main, effluent pipeline and treatment system).	Open	April 1992
Complete Part 4 (Institutional control and monitoring).	Open	Ongoing
Complete Part 5 (Groundwater, modeling and geochemical investigation).	Open	To be determined after the Work Plan is approved.

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RA No. 4, Silos 1 and 2

The Silos 1 and 2 Removal Action Work Plan was submitted to the U.S. EPA on November 5, 1990. The U.S. EPA approval of the Silos 1 and 2 Removal Action Work Plan was received on November 30, 1990.

The construction and checkout activities associated with modifying the Radon Treatment System (RTS) were completed July 16, 1991. The modifications to the RTS were completed in time to support K-65 Residue Resampling activities. Installation of equipment for the demonstration of the mapping equipment in Silo 4 was initiated on July 26, 1991. The following contracts associated with the procurement of the equipment necessary to complete the installation of the bentonite were awarded: the distributor spray head assembly package and the main basket weldment.

Work in August will center on awarding the remaining contracts associated with the procurement of the equipment necessary to complete the installation of the bentonite. Also, a demonstration of the mapping equipment in Silo 4 is scheduled to take place on August 2, 1991.

KEY MILESTONES	STATUS	DUE DATE
Complete installation of bentonite slurry into Silos 1 and 2.	Open, on schedule.	December 1, 1991

RA No. 5, K-65 Decant Sump Tank

The K-65 Decant Sump Tank Removal Action Work Plan was submitted to the U.S. EPA for approval on December 10, 1990. The U.S. EPA's conditional approval of the K-65 Decant Sump Tank Removal Action Work Plan was received on January 10, 1991. The responses to the issues included in the conditional approval were submitted to the U.S. EPA on February 8, 1991. A revised implementation schedule was included in those responses.

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RA No. 5, K-65 Decant Sump Tank (cont'd.)

Pumping and removal of the decant liquid was initiated on March 26, 1991. 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, HSL volatile organics, HSL semi-volatile organics, and HSL pesticide organics were received. Results obtained from the IT Laboratory from the Decant Sump water samples showed that no HSL chemicals are present, precluding the requirement for the sludge samples to undergo full HSL analyses. Sludge samples were collected from the decant sump in late June 1991. The sludge samples will be shipped to the IT Laboratory in August for full radiological analyses only.

The liquid pumped from the K-65 decant sump tank will be stored in the Plant 2/3 holding tanks until the analytical results are available and a RCRA determination is made. The analytical results and the RCRA determination will define the treatment required for the decant sump liquid.

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

RA No. 6, Waste Pit 6 Residues

This removal action was completed on December 19, 1990.

RA No. 7, Outfall Pipeline Replacement (Previously Outfall Pipeline Investigation and Repair)

A letter was issued to the U.S. EPA on February 15, 1991 entitled "Installation of a New Effluent Line and its Incorporation into the South Plume Removal Action." The letter summarized a recently completed study which indicated that the DOE would not attempt to repair the existing line either by in situ or an equivalent relining alternative. The construction of the new effluent line has been incorporated into RA No. 3, South Groundwater Contamination Plume. Please see that Removal Action for further information.

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RA No. 8, Plant 1 Pad Continuing Release

The revised Plant 1 Pad Continuing Release Removal Action Work Plan was submitted to the U.S. EPA and the Ohio EPA on June 14, 1991. The removal action consists of three phases. Phase I implements the run-on/off control measures. Phase II addresses the installation of 80,000 square feet of a new 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. Upgrading activities include installation of a polymeric vapor barrier over the existing concrete and the installation of concrete above the barrier with epoxy sealant. In addition, 22,000 square feet of the Phase III work area will be enclosed beneath a Sprung structure.

In July, activities included analysis of the additional sampling to characterize potential HSL contaminants for the Phase II work area. Verbal approval of the Work Plan by U.S. EPA was received on July 24, 1991.

Activities in August will include the receipt of analytical results and the mobilization of the construction contractor.

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CA Section X. Remedial Investigation and Feasibility Study (RI/FS)

This section provides an update on RI/FS Operable Units (OUs), RI/FS Community Relations, and Site Characterization for July 1991. Status information is presented for each of the five Operable Units identified in the Consent Agreement. The five Operable Units are described below:

- Operable Unit 1 (OU 1): Waste Pits 1-6, clearwell, burn pit.
- Operable Unit 2 (OU 2): Other Waste Units - fly ash piles, lime sludge, ponds, sanitary landfill and Southfield.
- Operable Unit 3 (OU 3): Production area and suspect areas outside production area (including effluent line to Great Miami River).
- Operable Unit 4 (OU 4): Silos 1, 2, 3, and 4.
- Operable Unit 5 (OU 5): All environmental media (i.e., including groundwater, surface water, soils, air, flora, fauna, etc.).

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Operable Unit 1: Waste Pits 1 - 6, Burn Pit, and Clearwell

1.1 Remedial Investigation

a. Status of Work - Key Milestones

Submittal of the Operable Unit 1 Remedial Investigation (RI) Report has been placed on hold pending the completion of additional waste pit sampling. A revised schedule for completing the RI Report was developed and submitted to the U.S. EPA and the Ohio EPA on June 28, 1991. The waste pit sampling was initiated in May 1991 and is scheduled to be completed in September 1991. A description of completed field activities is presented in Section 7.0, Site Characterization, in this document.

The schedule for all Operable Unit 1 RI/FS activities completed in June to support the Consent Agreement renegotiations was modified in July to evaluate various schedule scenarios proposed during the Consent Agreement negotiations with the U.S. EPA.

The draft Treatability Study Work Plan was revised to incorporate internal review comments. The draft Treatability Study Work Plan was submitted to the U.S. EPA for review on July 26, 1991.

Activity	Comment
Issue draft Treatability Study Work Plan to the U.S. EPA on July 26, 1991.	Completed. Comments expected within 30 days.

b. Issues/Problems

The approved sampling program for Operable Unit 1 does not include sampling of Pits 5, 6, and the Clearwell. Samples from these areas are required to support treatability testing. Sampling plans are being developed separately by WEMCO and will be forwarded by the DOE to the U.S. EPA in mid-August 1991.

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Operable Unit 1: Waste Pits 1 - 6, Burn Pit, and Clearwell

1.1 Remedial Investigation (cont'd.)

c. **Corrective Actions**

A Work Plan Addendum is being prepared for the sampling of Pits 5, 6, and the Clearwell. The plan is being reviewed internally.

d. **Planned Activities for August 1991**

Continue work toward the completion of the Work Plan Addendum for additional pit sampling to support treatability testing, incorporating review comments as appropriate.

Submit the Work Plan Addendum for Pits 5, 6, and the Clearwell to the U.S. EPA.

Receive comments from the U.S. EPA on the draft Treatability Study Work Plan and revise the plan as appropriate.

1.2 Feasibility Study

a. **Status of Work - Key Milestones**

Submittal of the Feasibility Study (FS) Report is on hold pending the completion of the additional waste pit sampling and treatability studies. Revised FS Report schedules were developed that include the additional sampling and treatability studies.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

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Operable Unit 1: Waste Pits 1 - 6, Burn Pit, and Clearwell

1.2 Feasibility Study (cont'd.)

d. **Planned Activities for August 1991**

August activities are reported under the Remedial Investigation, Section 1.1.d.

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SCHEDULES FOR THE SUBMITTAL OF PRIMARY DOCUMENTS UNDER THE TERMS OF THE CONSENT AGREEMENT ARE ON HOLD PENDING THE RENEGOTIATION OF THE REVISED CONSENT AGREEMENT DELIVERY DATES.

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Operable Unit 2: Other Waste Units

2.1 Remedial Investigation

a. **Status of Work - Key Milestones**

Submittal of the Operable Unit 2 RI Report has been delayed pending the completion of additional site characterization and the incorporation of this data into the RI Report.

The schedule for all Operable Unit 2 RI/FS activities completed in June to support the Consent Agreement renegotiations was modified in July to evaluate various schedule scenarios proposed during the renegotiations with the U.S. EPA.

Progress continued on the Operable Unit 2 additional site characterization program with completion scheduled for August. A description of completed field activities is presented in Section 7.0, Site Characterization, in this document.

The draft Treatability Study Work Plan was submitted to the U.S. EPA for review on July 30, 1991. The draft Treatability Study Work Plan was withdrawn to allow revision of the Plan to expedite completion of these activities with respect to the ongoing schedule negotiations. Resubmittal of the revised Work Plan to the U.S. EPA is expected by August 23, 1991.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

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Operable Unit 2: Other Waste Units

2.1 Remedial Investigation (cont'd.)

d. **Planned Activities for August 1991**

Complete work on sampling activities.

Incorporate review comments and complete the Treatability Study Work Plan for internal approval and U.S. EPA review.

2.2 Feasibility Study

a. **Status of Work - Key Milestones**

Submittal of the Operable Unit 2 FS Report has been delayed pending the completion of additional site characterization and incorporation of this information into the report.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

August activities are reported under the Remedial Investigation, Section 2.1.d.

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SCHEDULES FOR THE SUBMITTAL OF PRIMARY DOCUMENTS UNDER THE TERMS OF THE CONSENT AGREEMENT ARE ON HOLD PENDING THE RENEGOTIATION OF THE REVISED CONSENT AGREEMENT DELIVERY DATES.

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Operable Unit 3: Production Area and Suspect Areas

3.1 Remedial Investigation

a. **Status of Work - Key Milestones**

Operable Unit 3 activities in July included planning, scheduling, and budgeting for the revised scope of work derived from the earlier dispute resolution and the ongoing Consent Agreement negotiations. Revised schedule packages were prepared in July to support the Consent Agreement negotiations with the U.S. EPA.

Continuing Remedial Investigation work performed during July included the preparation of a process knowledge interview questionnaire and the review of historical site data/records.

Research of the Atomic Energy Commission/Department of Energy (AEC/DOE) archives on the potential vault in the north flagpole area was completed. No evidence of a vault has been found. A draft report has been prepared and is currently undergoing internal review.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

Continue scoping activities for Operable Unit 3. Scoping includes collection and analysis of existing plant historical data and collection of process knowledge information through personnel interviews.

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Operable Unit 3: Production Area and Suspect Areas

3.2 Feasibility Study

a. **Status of Work - Key Milestones**

Development of detailed scoping logic related to the revised Operable Unit 3 scope of work continued in July. Detailed schedules and logic through draft Record of Decision (ROD) submittal were prepared to support the Consent Agreement negotiations with the U.S. EPA.

The U.S. EPA accepted the comment responses and approved the expanded scope of the revised Initial Screening of Alternatives (ISA) Report outline.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

No work on the FS is planned for August.

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SCHEDULES FOR THE SUBMITTAL OF PRIMARY DOCUMENTS UNDER THE TERMS OF THE CONSENT AGREEMENT ARE ON HOLD PENDING THE RENEGOTIATION OF THE REVISED CONSENT AGREEMENT DELIVERY DATES.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Operable Unit 4: Silos 1, 2, 3, and 4

4.1 Remedial Investigation

a. **Status of Work - Key Milestones**

Work on the RI Report is on hold awaiting the conclusion of the site characterization program for Operable Unit 4.

In July, a schedule for the completion of all Operable Unit 4 RI/FS activities was presented to the U.S. EPA as part of the renegotiations of the Consent Agreement. Comments were received and responses provided relative to schedule durations and purpose of the activities. These comments were evaluated and incorporated into the Operable Unit 4 schedules.

The Treatability Study Work Plan for chemical separation and cement stabilization of Operable Unit 4 materials was submitted to the U.S. EPA on July 23, 1991. A draft treatability study work plan for vitrification was prepared and issued for internal review on July 23, 1991.

The K-65 slant boring activities continued in July. Samples were collected at the three remaining slant boring locations. The K-65 silo content resampling was resumed in July upon the successful restart of the Radon Treatment System (RTS). A detailed description of field activities is presented in Section 7.0, Site Characterization, in this document.

Activity	Comment
Issue the draft Treatability Study Work Plan to the U.S. EPA on July 23, 1991.	Completed. Comments expected in 30 days.

b. **Issues/Problems**

None to report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Operable Unit 4: Silos 1, 2, 3, and 4

4.1 Remedial Investigation (cont'd.)

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

Complete field activities on the slant boring programs.

Complete silo contents resampling using the modified Radon Treatment System.

Revise the Operable Unit 4 Treatability Study Work Plan, as required, to reflect the U.S. EPA review comments.

4.2 Feasibility Study

a. **Status of Work - Key Milestones**

No activities were completed on this task during July pending receipt of site characterization analytical results.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

No activities can be completed until analytical results of the site characterization are received.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

SCHEDULES FOR THE SUBMITTAL OF PRIMARY DOCUMENTS UNDER THE TERMS OF THE CONSENT AGREEMENT ARE ON HOLD PENDING THE RENEGOTIATION OF THE REVISED CONSENT AGREEMENT DELIVERY DATES.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Operable Unit 5: All Environmental Media

5.1 Remedial Investigation

a. **Status of Work - Key Milestones**

The issuance of the RI Report remains on hold pending the completion of additional sampling and the resolution of the revised schedule.

The schedule for Operable Unit 5 RI activities was finalized in June. The schedule was prepared to support the Consent Agreement renegotiations which continued in July. The schedule for all activities was modified to evaluate various scenarios proposed during the negotiations.

A Treatability Study Work Plan is being prepared for Operable Unit 5 soils.

A description of completed Operable Unit 5 field activities is presented in Section 7.0, Site Characterization, in this document.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1991**

Continue site characterization activities.

Continue preparation of the Treatability Study Work Plan.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Operable Unit 5: All Environmental Media

5.2 Feasibility Study

a. **Status of Work - Key Milestones**

The issuance of FS deliverables remains on hold pending resolution of the revised schedules. A schedule for all FS activities was finalized in June in support of Consent Agreement renegotiations currently in progress. During renegotiations, the definition of Operable Unit 5 was changed to include portions of Operable Unit 3 (i.e., all soils and perched groundwater). Based on this revised definition, it was determined that the approved Operable Unit 5 Initial Screening of Alternatives document would require revision. Work to review the approved Operable Unit 5 Initial Screening of Alternatives document was initiated in July.

Activity	Comment
Issue revised Initial Screening of Alternatives to the U.S. EPA.	The U.S. EPA and the DOE have agreed to renegotiate the delivery date.
Issue draft FS Report to the U.S. EPA.	The U.S. EPA and the DOE have agreed to renegotiate the delivery date.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Operable Unit 5: All Environmental Media

5.2 Feasibility Study (cont'd.)

d. **Planned Activities for August 1991**

Continue the revision of the Operable Unit 5 Initial Screening of Alternatives report based upon redefinition of the operable unit developed during Consent Agreement renegotiations.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

SCHEDULES FOR THE SUBMITTAL OF PRIMARY DOCUMENTS UNDER THE TERMS OF THE CONSENT AGREEMENT ARE ON HOLD PENDING THE RENEGOTIATION OF THE REVISED CONSENT AGREEMENT DELIVERY DATES.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

6.0 RI/FS Community Relations

a. Status of Work

The second Community Meeting of 1991 was held July 16 at the Meadowbrook Inn in Ross, Ohio. Roughly 170 persons attended with about 60 considered the "general public." Leo Duffy, Director of DOE's Environmental Restoration and Waste Management Division, was present. Mr. Duffy gave an introductory speech and assisted the other four panelists in answering questions during the question and answer session. Gerald Westerbeck gave the site office overview. Jack Craig gave an update on the RI/FS, and Ray Hansen spoke about "safe shutdown" at the site. Teressa Kwiatkowski was moderator.

The third issue of the publication dealing with cleanup at the FMPC was distributed in July. The new name of the publication is *Fernald Site Cleanup Report*, and it replaces *Cleanup Update*. The publication includes a brief description of CERCLA cleanup activities which have occurred since the last community meeting.

The DOE made a presentation to the Fernald Residents for Environment, Safety, and Health's (FRESH) July meeting.

A Community Roundtable on "Radiation" was held on July 29, 1991. Eight community residents were in attendance.

b. Issues/Problems

None to report for July.

c. Corrective Action

The problem identified in the June 1991 CA/FFCA Monthly Progress Report regarding the Meadowbrook Inn as a public meeting place was corrected by adding this location to Appendix F, Locations for Public Meetings, of the Community Relations Plan as part of the revision to be submitted in August for U.S. EPA review and approval. The meeting location was also identified in a letter to the U.S. EPA as reported in June's CA/FFCA Monthly Progress Report.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

6.0 RI/FS Community Relations (cont'd.)

d. Planned Activities for August 1991

Place the transcript of July 16 Community Meeting in the PEIC reading rooms.

Submit revised appendices to the RI/FS Community Relations Plan. Volume III of the Work Plan, to the U.S. EPA.

Hold Community Roundtable on "Fernald Site Cleanup Progress" on August 12, 1991.

Hold a ceremony to rename the Feed Materials Production Center (FMPC) on August 23, 1991.

Make DOE monthly presentation to FRESH on August 29, 1991.

The Community Relations Plan for the K-65 decant sump tank removal action will be submitted for inclusion in the Administrative Record and submitted to the U.S. EPA as an addendum to the RI/FS and Removal Action Community Relations Plan.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

7.0 Site Characterization

Operable Unit 1 Field Sampling: Waste Pits

The Waste Pit 1 sampling activity (three wells) was completed in July with the installation of the last two wells. Borings 1766 and 1765 were completed in Waste Pit 1 and wells were set to depths of 20.7 and 22.4 feet, respectively.

The Burn Pit sampling was completed in July. Water was encountered in Borings 1777 and 1776, and wells were set to depths of 26.0 and 32.5 feet, respectively.

Analyses of the samples taken for Operable Unit 1 are being performed as specified by Appendix IV (40CFR264). Currently, these additional analyses are being completed on one solid sample from each of the 13 locations. If leachate is encountered at any location, it will also be analyzed for Appendix IX constituents.

Operable Unit 2 Field Sampling: Other Waste Units

Boring operations at the Active Fly Ash Pile were completed in July 1991. Borings 1724 and 1723 were completed at the Active Fly Ash Pile. No groundwater was encountered and the borings were grouted closed.

Two borings, 1721 and 1723, were completed at the Sanitary Landfill. No water was encountered. The boreholes were plugged and abandoned. Samples were shipped to the IT laboratory for required analyses.

All borehole cuttings generated from the Operable Unit 2 borings will be drummed and handled as a treatability sample and stored at the Fernald site. Chain-of-custody records and logs were established to track and secure the drummed cuttings.

Analyses specified by Appendix IX are being performed on one sample from each of the Sanitary Landfill borings. Analyses specified by Appendix IX will also be performed on samples from both Lime Sludge Ponds as well as on any standing water on these ponds.

7.0 Site Characterization (cont'd.)

Operable Unit 4 Field Sampling: Silos 1, 2, 3, and 4

Slant Boring

The drilling of Boring 2 (1616) was terminated on July 2, 1991 when the borehole neared the interface between the glacial overburden and the aquifer. Another groundwater sample was taken for a second water zone encountered in the borehole. A total length of 120 feet was drilled. The boring end point is located nine feet below the K-65 silo decant tank and three feet past the western edge of the tank. The boring was plugged and abandoned after collection of the second groundwater sample.

The drilling at Boring 5 (1619) was initiated on July 19, 1991 and was rapidly drilled until a water-bearing zone consisting of clay-like fine sand was encountered. A total length of 110 feet was reached by July 25, 1991. The progress was enhanced by drilling without temporary casing.

Good progress was also made on Boring 4 (1618). As of July 31, 1991, the borehole had been drilled to a length of 85 feet. Starting at a drill angle of approximately 5 degrees, the bore should pass 3.66 feet underneath the Silo 1 footer. The soil encountered primarily ranged between light yellowish brown and light olive brown clays and clay-like silts. No water had been encountered in Boring 1618.

Vertical Borings

The field portion of this task was completed in June 1991. Sampling results are pending.

7.0 Site Characterization (cont'd.)

Operable Unit 4 Field Sampling: Silos 1, 2, 3, and 4

Silo Content Sampling

Mock-up training in support of the K-65 Silo Content Sampling was completed on July 8, 1991. The classroom review of the Operational Safety Requirement (OSR) document. Sampling and Analysis Plan, and Detailed Work Procedures was attended by appropriate project personnel.

Initiation of K-65 Content Sampling was delayed from July 11 to July 18, 1991 due to operational problems with the Radon Treatment System and two rain days. A Zone "C" sample was removed from the southeast manway of Silo 2 on July 18, 1991.

Zones "A," "B," and "C" sampling have been attempted on the northwest manway of Silo 2. The northwest manway was deeply coned and appeared to be a collapsed borehole. Efforts to recover Zones "A" and "B" samples were unsuccessful. The Zone "C" effort resulted in a 54% recovery. All sampling criteria were satisfied and samples forwarded to the laboratory for analysis.

A Zone "A" sample from the northeast manway was retrieved on July 31, 1991. Approximately one foot of the 66 inch attempt was recovered. This attempt appears to have been jeopardized by previous bores. Difficulty should be anticipated when attempting a new boring in previously sampled manways.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

7.0 Site Characterization (cont'd.)

Operable Unit 5 Field Sampling: All Environmental Media

Paddy's Run South

Groundwater sampling for the period of July 6 - August 5 will be completed on August 6, 1991, one day behind schedule.

Installation and surveying of Wells 2552, 3552, 2553, 2557, and 3557 are still required. A rig will be mobilized in August to begin installing these wells.

During July, surface water samples and measurements were collected at five locations along Paddy's Run Creek in support of the Paddy's Run Creek South Seepage Investigation.

8-RCRA Wells

Due to slow recharge rates among the wells installed, Wells 1645 and 1646 require development for first and second rounds water sampling. The other six wells require second round sampling. Upon completion, these wells will be turned over to the site Environmental Monitoring Program.

Water Level Measurements

Water-level measurements at 410 well locations were completed in July 1991.

Maps for piezometer locations are being revised and updated to include all new installations.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY
COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

8.0 Engineered Waste Management Facility (EWMF) RI/FS Site Characterization and Suitability Investigation

a. Status of Work

A Sampling and Analysis Plan (SAP) comment resolution meeting was conducted on June 7, 1991 to address issues of concern and comment incorporation into the SAP. Based upon that meeting, an additional internal review/revision cycle for the SAP was added to the schedule. The draft SAP was revised and issued on July 22, 1991, for final internal review and comment.

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for August 1991

Revise the SAP and incorporate final internal review comments as they become available.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

PERIOD ENDING JULY 31, 1991

ENCLOSURE A

WASTEWATER FLOWS AND RADIONUCLIDE CONCENTRATIONS UNDER CA SECTION XXIII.B

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Introduction

The accompanying Effluent Radiation Reports provide, in accordance with the requirements of Section XXIII.B of the Consent Agreement under CERCLA Section 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 June 1991.

Summary - June 1991

The total quantity of uranium discharged from the FMPC to the Great Miami River via Manhole 175 (Outfall 1I000004001) was 14.91 kilograms. The average uranium concentration for the previous 12 months was 0.86 mg/l. This is 96.6 percent of the Derived Concentration Guide (DOE Order 5400.5) for dischargeable offsite water.

There was no discharge from the Stormwater Retention Basin (Outfall 1I000004002) to Paddy's Run via the Storm Sewer Outfall Ditch in June 1991. Based on 0.17 inches of rainfall in June 1991, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FMPC is estimated to be 0.76 kilograms.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Wastewater Flows and Radionuclide Concentrations

FACILITY: Feed Materials Production Center, U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton
9002 M 9501 900212

LOCATION: 1I000004001; 001 Total Discharge
Manhole 175 (Effluent to Great Miami River)

MONTH: July 1991

Day	Flow (MGD)	Total Alpha (pCi/l)	Total Beta (pCi/l)	Total U (mg/l)	Total U (kgs)	Calculated Total U-238 (pCi/l) (1)
1	0.346	126	225	0.32	0.42	108
2	0.282	126	99	0.30	0.32	101
3	0.249	113	36	0.22	0.21	74
4	0.228	131	72	0.34	0.29	115
5	0.294	158	77	0.28	0.31	95
6	0.259	167	117	0.36	0.35	122
7	0.293	171	149	0.40	0.44	135
8	0.508	257	117	0.46	0.88	155
9	0.802	176	117	0.40	1.21	135
10	1.293	86	117	0.24	1.17	81
11	0.995	176	153	0.22	0.83	74
12	1.056	239	126	0.26	1.04	88
13	1.015	216	86	0.28	1.08	95
14	0.970	198	68	0.26	0.95	88
15	0.368	221	153	0.32	0.45	108
16	0.871	167	135	0.28	0.92	95
17	1.038	270	90	0.28	1.10	95
18	1.020	270	117	0.26	1.00	88
19	1.100	185	144	0.34	1.41	115
20	0.218	212	207	0.28	0.23	95
21	0.170	279	104	0.46	0.30	155
22	0.343	207	90	0.36	0.47	122
23	0.263	167	158	0.26	0.26	88
24	0.319	198	72	0.22	0.27	74
25	0.278	167	68	0.22	0.23	74
26	0.313	122	72	0.16	0.19	54
27	0.242	194	95	0.28	0.26	95
28	0.269	153	68	0.28	0.28	95
29	0.363	419	248	0.40	0.55	135
30	0.349	252	189	0.30	0.40	101
31	0.317	194	99	0.32	0.38	108
	---				---	
	16.431				18.21	

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Wastewater Flows and Radionuclide Concentrations (cont'd.)

FACILITY: Feed Materials Production Center

LOCATION: 001 Total Discharge

MONTH: July 1991

	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.	0.530	197	118	0.29	0.59	99
Max.	1.293	419	248	0.46	1.41	155
Min.	0.170	86	36	0.16	0.19	54

The average uranium concentration for the previous 12 months was 0.84 mg/l. This is 94.4 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

Comments: (1) The calculated total U-238 is based on a conversion factor of 337.84 pCi U-238/mg Total U applied to the measured value of total uranium.

(2) Average values presented are flow-weighted.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

Wastewater Flows and Radionuclide Concentrations (cont'd.)

FACILITY: Feed Materials Production Center, U.S. Department of Energy
7400 Willey Road, P.O. Box 398704
Cincinnati, Ohio 45239 Hamilton
9002 M 9501 900212

LOCATION: 1I000004002, 002 Discharge (Overflow) to Storm Sewer Outfall Ditch
Stormwater Retention Basin Spillway (Effluent to Paddy's Run)

MONTH: July 1991

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

Based on 2.58 inches of rainfall in July 1991, the uranium discharge to Paddy's run from uncontrolled areas of the FMPC is estimated to be 11.61 kgs.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

PERIOD ENDING JULY 31, 1991

ENCLOSURE B

FFCA: INITIAL REMEDIAL MEASURES AND OTHER OPEN ACTIONS

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

INTRODUCTION

Enclosure B describes actions undertaken at the Fernald site during the period July 1 through July 31, 1991 that are not covered by the reporting requirements of the Consent Agreement 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 brevity's sake. 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 Section 7, Site Characterization, Operable Unit 4 Field Sampling: Silos 1, 2, 3, and 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 under CERCLA Sections 120 and 106(a).

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

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

3. Reports and Record Keeping

Section B

The RI/FS Monthly Technical Progress Report for June 1991 was transmitted to the U.S. EPA on July 19, 1991 as an integral part of the Consolidated Consent Agreement/Federal Facility Compliance Agreement (CA/FFCA) Monthly Progress Report in accordance with requirements of Section X of the Consent Agreement.

CLEAN AIR ACT (CAA)

Section E

The eighteenth Quarterly Particulate Emissions Report for the period January 4, 1991 through April 5, 1991 was submitted to the U.S. EPA on May 24, 1991.

RADIATION DISCHARGE INFORMATION

Section A

The eighteenth Quarterly Liquid Discharge Report for the period January through March 1991 was submitted to the U.S. EPA on May 24, 1991.

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

Period Ending July 31, 1991

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

REPORTING REQUIREMENTS

Section B

The Federal Facility Compliance Agreement Monthly Progress Report for June 1991 was transmitted to the U.S. EPA on July 19, 1991 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 JULY 31, 1991

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY91 STATUS
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 the 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 the Consent Agreement under CERCLA Section 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 the Consent Agreement under CERCLA Section 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 the Consent Agreement under CERCLA Section 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 June 1991 was transmitted to the U.S. EPA on July 19, 1991 (DOE-1877-91).
CLEAN AIR ACT			
B.4	Prepare annual progress report on installation and replacement of emission control devices.	yearly	The Third Annual Progress Report on installation and replacement of emission control devices was transmitted to the U.S. EPA on February 8, 1991 (DOE-708-91).
C.	Provide annual reports to U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY 1990 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 FMPC, the 1989 FFCA Stack Testing Program was being deferred. Notification of future stack testing dates will be provided to the U.S. EPA if and when a decision on the restart of facilities at the FMPC is made.
D.2	Provide U.S. EPA with stack-test results for stacks tested that year.	45 days	Stack testing is currently on hold pending resumption of manufacturing operations. Notification of future stack testing dates will be provided to the U.S. EPA if and when a decision on the restart of production activities at the FMPC is made.

TABLE 1

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

STATUS OF ACTIONS AS OF JULY 31, 1991

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY91 STATUS
E.1	Maintain records of monthly particulate matter emissions.	-------	Continuing.
E.2	Provide quarterly reports to U.S. EPA on these emissions.	quarterly	The eighteenth Quarterly Particulate Emissions Report for the period January 4, 1991 through April 5, 1991 was submitted to the U.S. EPA May 24, 1991 (DOE-1389-91). The seventeenth Quarterly Particulate Emissions Report for the period October 5, 1990 through January 4, 1991 was transmitted to the U.S. EPA on March 8, 1991 (DOE-773-91).
RCRA			
A.1	Conduct a hazardous waste determiniation on all waste streams.	30 days	Pursuant to the amended Consent Decree, a RCRA waste evaluation will be conducted on all site 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 17, 1986. However, further review of both the waste streams and the potential of the units to be hazardous waste management units are being evaluated as actions required by the 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 1 of the RCRA Part B Permit Application submitted to the U.S. EPA on September 22, 1989. 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 JULY 31, 1991

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY91 STATUS
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 eighteenth Quarterly Liquid Discharge Report for the period January through March 1991 was transmitted to the U.S. EPA on May 24, 1991 (DOE-1389-91). The seventeenth Quarterly Liquid Discharge Report for the period October through December 1990 was transmitted to the U.S. EPA on March 8, 1991 (DOE-773-91).
REPORTING REQUIREMENTS			
B.	Issue monthly progress report of actions taken to ensure compliance with FFCA requirements.	monthly	June's FFCA Monthly Progress Report was transmitted to the U.S. EPA on July 19, 1991 (DOE-1877-91).

CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY COMPLIANCE AGREEMENT MONTHLY PROGRESS REPORT

PERIOD ENDING JUNE 30, 1991

ENCLOSURE C

DRILLING AND BORING LOGS

NALD
RI/FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS (OU-1)		
BORING NUMBER: 1766 (WASTE PIT #1)	COORDINATES:		DATE: 7-13-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7/13/91
ENGINEER/GEOLOGIST: GARMAN / HARRIS	Depth	Date/Time	DATE COMPLETED: 7-16-91
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 1 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN.)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	63041 7-13 0955	8	6	MEDIUM DENSE (2.5Y, 4/3) OLIVE BROWN CLAYEY SILT. ROOTLETS. SLIGHTLY MOIST.	ML	NA	NA	HNU 0; α 0; BZ 2000
1	63042 7-13 0955	13	6	MEDIUM DENSE (2.5Y, N4/) DARK GRAY CLAY-SIZED POWDER. COHESION DUE TO MOISTURE-NO MEASURABLE PLASTICITY. TRACE YELLOW PRECIPITANT. SLIGHTLY MOIST.	NA	NA	NA	HNU 0; α 0; BZ 14,000
	63043 7-13 0955	16	4	MEDIUM DENSE (2.5Y, N5/) GRAY CLAY-SIZED POWDER WITH WAXY/FILMY APPEARANCE. NO MEASURABLE PLASTICITY. SLIGHTLY MOIST.	NA	NA	NA	HNU 0; α 0; BZ 1500
2	63044 7-13 1005	12	6	MEDIUM DENSE (2.5Y, N4/) GRAY CLAY-SIZED POWDERY PARTICLES. NO PLASTICITY. SLIGHTLY MOIST.	NA	NA	NA	HNU 0; α 0; BZ 1500
	63045 7-13 1005	13	6	SAA	NA	NA	NA	HNU 0; α 0; BZ 2000
3	63046 7-13 1005	13	0	NR	NA	NA	NA	HNU NA; α NA; BZ NA
	63047 7-13 1010	17	6	MEDIUM DENSE (2.5Y, N4/) GRAY CLAY-SIZED POWDER. NO PLASTICITY. LITTLE OR NO COHESION WHEN DRIED. SLIGHTLY MOIST.	NA	NA	NA	HNU 0; α 0; BZ 1500
HSL VOA 4	63048 7-13 1010	11	6	SAA	NA	NA	NA	HNU 0; α 0; BZ 1800
	63049 7-13 1010	10	6	SAA	NA	NA	NA	HNU 0; α 0; BZ 1800
5 6	63050 7-13 1040	SHELBY TUBE PUSHED BLOW COUNTS NOT APPLICABLE	22	SHELBY TUBE PUSHED FROM 4.5 TO 7.0 FT. ~22 INCHES RECOVERY. MATERIAL SAA.	NA	NA	NA	HNU 0; α 0; BZ 1000
7	63051 7-13 1500	24	6	MEDIUM DENSE (2.5Y, N4/) GRAY CLAYLIKE MATERIAL. LOW PLASTICITY - SLIGHT COHESION MODERATELY MOIST.	NA	NA	NA	HNU 0; α 0; BZ 1500

NOTES.

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: SIMCO

Driller: E.W. GARDNER

ASST: K. MYERS

NR = NO RECOVERY
SAA = SAME AS ABOVE
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0
α = 0
BZ = 60

INALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS (OU-1)		
BORING NUMBER: 1766 (WASTE PIT #1)	COORDINATES:		DATE: 7-13-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-13-91
ENGINEER/GEOLOGIST: HARRIS\GARMAN	Depth	Date/Time	DATE COMPLETED: 7-16-91
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 2 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6/N)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	NA WELL CONSTRUCTION	REMARKS
8	63052 7-13 1500	3	6	FIRM (10YR, 4/2) DARK GRAYISH BROWN SILTY CLAY-LIKE MATERIAL. MODERATE COHESION. MOIST.	CL	1.0		HNU 0; α 0; BY 2000
	63053 7-13 1500	2	6	FIRM (10YR, 4/2) DARK GRAYISH BROWN, MOTTLED WITH (10YR, 4/6) RED SILTY CLAY-LIKE MATERIAL. MODERATE COHESION. MOIST.	CL	1.0		HNU 0; α 0; BY 2500
9, 10	63054 7-13 1520	SHELBY TUBE PUSHED BLOW COUNTS NOT APPLICABLE	24	SHELBY TUBE PUSHED FROM 8.5 TO 11.0 FT. - 24 INCHES RECOVERY. DESCRIPTION NOT AVAILABLE - BOTTOM CAPPED IMMEDIATELY TO PREVENT SPILLAGE.	NA	NA		HNU 0; α 0; BY 2000
11	63055 7-13 1530	1	6	FIRM (2.5Y, N3/) VERY DARK GRAY SILTY CLAY-LIKE. MODERATE COHESION. MODERATE PLASTICITY. MOIST.	CL	1.0		HNU 0; α 0; BY 1500
12	63056 7-13 1530	1	6	SAA	CL	1.0		HNU 0; α 0; BY 2000
	63057 7-13 1530	1	6	SAA	CL	1.0		HNU 0; α 0; BY 2000
13	63058 7-13 1540	1	6	FIRM (2.5Y, N3/) VERY DARK GRAY SILTY CLAY-LIKE MATERIAL. MODERATE COHESION. MODERATE PLASTICITY. MOIST.	CL	0.75		HNU 0; α 0; BY 1700
	63059 7-13 1540	4	6	SAA	CL	0.75		HNU 0; α 0; BY 1700
HSL VOA 14	63060 7-13 1540	3	6	SAA	CL	0.75		HNU 0; α 0; BY 1700
15	63062 7-14 0940	SHELBY TUBE		SHELBY TUBE PUSHED FROM 14.0 TO 16.5 FT.				

NOTES.

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: SIMCO

Driller: E.W. GARDNER

ASST: K. MYERS

SAA = SAME AS ABOVE
NR = NO RECOVERY
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0 ppm
α = 0 cpm
BY = 100 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI\FS (OU-1)		
BORING NUMBER: 1766 (WASTE PIT #1)	COORDINATES:		DATE: 7-14-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-13-91
ENGINEER/GEOLOGIST: HARRIS \ GARMAN	Depth	Date/Time	DATE COMPLETED: 7-16-91
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 3 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	NA WELL CONSTRUCTION	REMARKS
15		PUSHED BLOW COUNTS NOT APPLICABLE	26	26 INCHES RECOVERY. DESCRIPTION NOT AVAILABLE - BOTTOM CAPPED IMMEDIATELY TO PREVENT SPILLAGE.	NA	NA		HNU 0; α 0; BY 1000
16								
17	63063 7-14 0950	4	6	SOFT (2.5Y, N3/) VERY DARK GRAY CLAY-SIZED PARTICLES, CONSISTENCY SIMILAR TO GELATIN. LOW PLASTICITY. VERY MOIST.	CL	0.5		HNU 0; α 0; BY 1500
HSL VOA	63064 7-14 0950	2	6	SAA	CL	0.5		HNU 0.5; α 0; BY 1700
CLP VOA	63065 7-14 0950	2	6	SAA	CL	0.5		HNU 0.5; α 0; BY 2000
18	63066 7-14 1000	3	6	SOFT (2.5Y, N3/) VERY DARK GRAY - GRADING INTO (2.5Y, N7/) LIGHT GRAY CLAY-LIKE MATERIAL. GELATIN-LIKE CONSISTENCY. LOW PLASTICITY. VERY MOIST.	CL	0.5		HNU 0.1; α 0; BY 1500
	63067 7-14 1345	3	6	SOFT (2.5Y, N3/) VERY DARK GRAY SILTY CLAY-LIKE MATERIAL. LOW PLASTICITY - VERY MOIST.	CL	0.5		HNU 0.1; α 0; BY 1700
19	63068 7-14 1350	3	6	SAA	CL	0.5		HNU 0.1; α 0; BY 1700
	63069 7-14 1400	3	6	SOFT (10YR, 4/2) DARK GRAYISH BROWN CLAY-LIKE MATERIAL MOTTLED WITH (10YR, 4/8) RED. SOME (2.5Y, 6/4) LIGHT YELLOW BROWN GRANULAR MATERIAL. LOW PLASTICITY. VERY MOIST.	CL	0.5		HNU 0.5; α 0; BY 2000
20	63070 7-14 1420	4	6	(20.0'-20.4') FIRM (10YR, 4/2) DARK GRAYISH BROWN SILTY CLAY-LIKE MATERIAL. MODERATE COHESION. MODERATE PLASTICITY. VERY MOIST.	CL	1.0		HNU 0; α 0; BY 1700
LINER C				(20.4'-20.5') CLAY LINER: VERY HARD (10YR, 5/4) CLAY. HIGH PLASTICITY. LOW MOISTURE.	CL	>4.0		
				BOTTOM OF BORING AT 20.5 FT. PIEZOMETER INSTALLED PIEZOMETER TIP AT 20.5 FT.				

NOTES.

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: SIMCO

Driller: E.W. GARDNER

ASST: K. MYERS

SAA = SAME AS ABOVE
NR = NO RECOVERY
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0 ppm
α = 0 cpm
BY = 80 cpm

FERNALD RI/FS

COMPOSITE SAMPLING DIAGRAM

3 INTERVAL BOREHOLE

PROJECT NAME	FMPC RI/FS(OU-1)	BORING NUMBER	1766
PROJECT NUMBER	602.25.91	BORING LOCATION	WASTE PIT #1
DATE COLLECTED	7-13, 7-14, 7-15, 7-16-91		

INTERVAL 1

COMPOSITE SAMPLES

SAMPLE NUMBER	ANALYSES
63073	TREATABILITY

INTERVAL 2

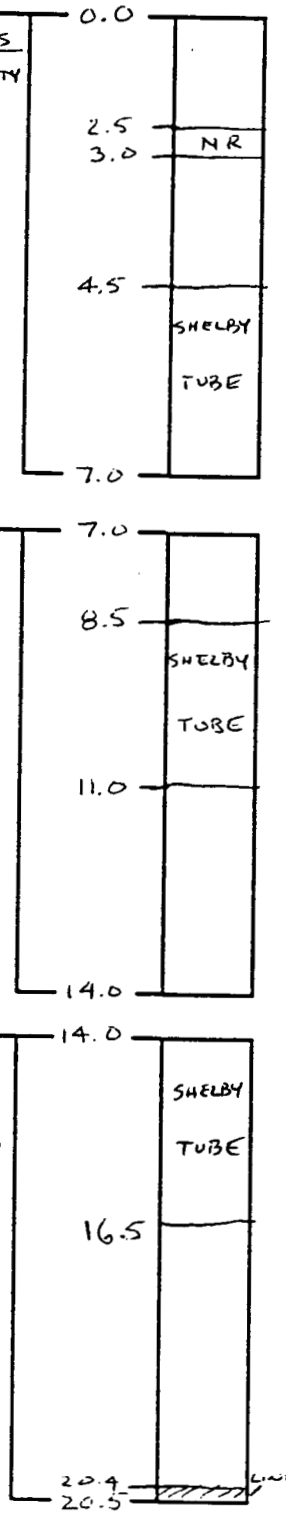
COMPOSITE SAMPLES

SAMPLE NUMBER	ANALYSES
63061	SCREEN; FULL HSL (LESS VOA) + DIOXINS, FURANS, TBP; FULL RAD
63074	TREATABILITY

INTERVAL 3

COMPOSITE SAMPLES

SAMPLE NUMBER	ANALYSES
63071	SCREEN; FULL HSL (LESS VOA) + DIOXINS, FURANS, TBP; FULL RAD
63075	TREATABILITY



ENTIRE BOREHOLE

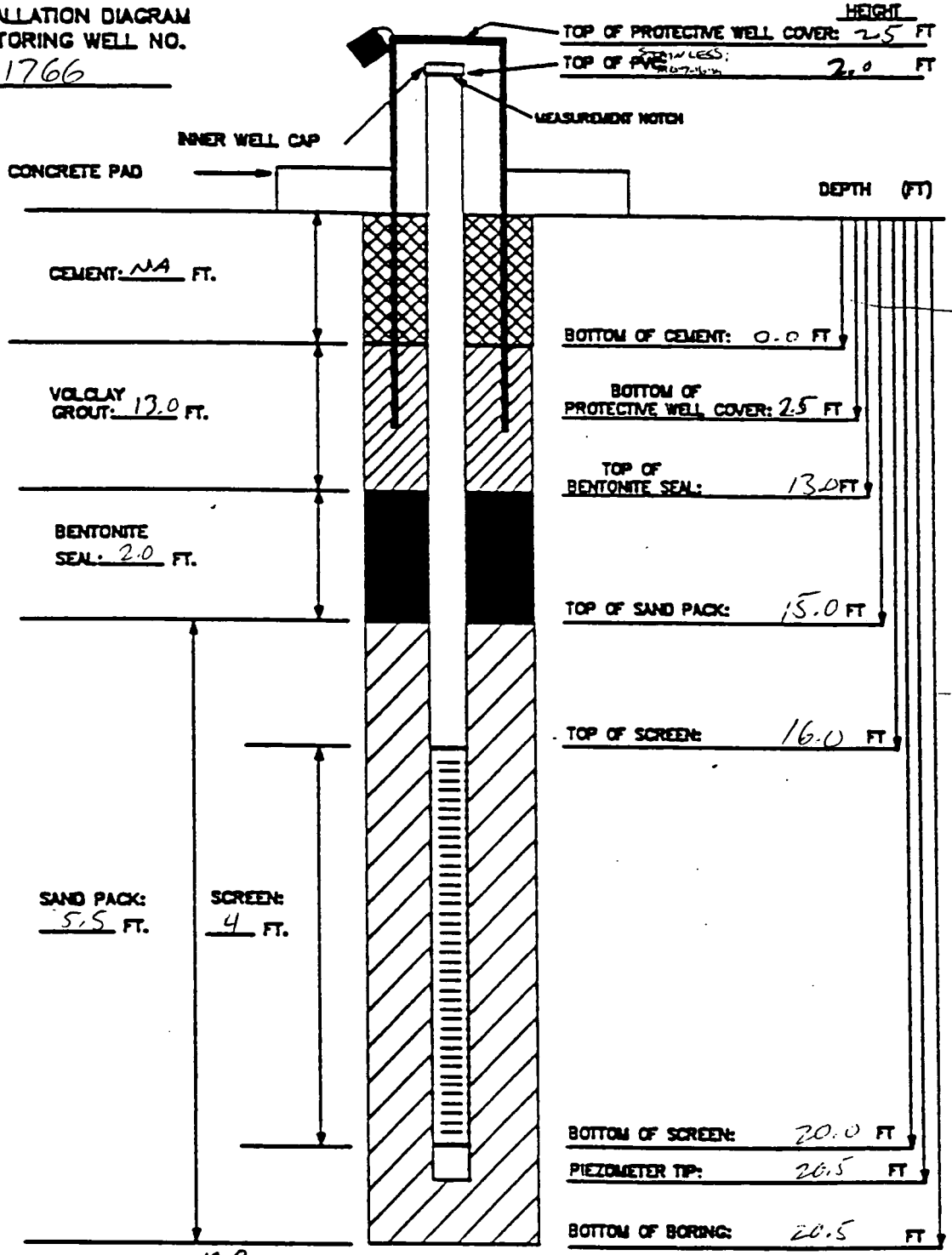
COMPOSITE SAMPLES

SAMPLE NUMBER	ANALYSES
63072	SCREEN; TCLP (LESS VOA); FULL RAD; GSA; UDL; TOC
63076	TREATABILITY
B-1766 (DRUMS #1-4)	TREATABILITY/ ARCHIVE

INSTALLATION DATE: 7/16/91 2126

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1766



BOREHOLE DIAMETER: 10.0 INCHES

MATERIALS USED:
SAND TYPE AND QUANTITY: 1 80 lb BAG 10/20 SAND
BENTONITE PELLETS (5-GALLON BUCKETS): 0.5
BAGS OF VOLCLAY GROUT: 2.5 50 lb BAGS
AMOUNT OF CEMENT: NA
AMOUNT OF WATER USED: 2 GALLONS
OTHER: 3'x3' CONCRETE PAD
DIGL AS INSTALLED

NOTES: 4" NO STAINLESS STEEL
1) RISER PIPE IS 2-INCH-SCHEDULE-40 PVC 7/10/91 PVC PIPE, FLUSH-THREADED JOINTS.
2) SCREEN IS 2-INCH-I.D.-SCHEDULE-40 4" NO STAINLESS PVC PIPE WITH 0.020-INCH SLOTS.
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: 7.4 VOTOL 7-17-91

TASK: (0.1-1) 602.25.91 GEOLOGIST/ENGINEER: Harris / Garman

2126

NALD
AI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI\FS FIELD ENG./GEO. Marc Harris DATE 7/16/91
PROJECT NO. 1007.25.91 CHECKED BY DATE
BORING NO. 1766
PIEZOMETER NO. 1766 DATE OF INSTALLATION 7/16/91

BOREHOLE DRILLING

DRILLING METHOD Hollow Stem Auger	TYPE OF BIT Auger
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID None FROM ~~TO~~	SIZE None FROM ~~TO~~
FLUID None FROM ~~TO~~	SIZE None FROM ~~TO~~

PIEZOMETER DESCRIPTION

TYPE Monitor Well	RISER PIPE MATERIAL 316 Stainless Steel
DIAMETER OF PERFORATED SECTION 4.0" I.D.	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. 4 3/8 in. I.D. 4.0 in.
SLOTS ☒ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS 10.0', 5.0', 2.0', 1.0'
AVERAGE SIZE OF PERFORATIONS 0.01 in.	JOINING METHOD Flush Joint Threaded
TOTAL PERFORATED AREA 4.0 ft.	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 ft	OTHER PROTECTION Hinged Locking
PROTECTIVE PIPE O.D. 10 3/4 in.	Cover w/ Padlock

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 0.0	BOTTOM 13.0	TOP	BOTTOM
BENTONITE	TOP 13.0	BOTTOM 15.0	TOP	BOTTOM
SAND	TOP 15.0	BOTTOM 20.5	TOP	BOTTOM
GRAVEL NONE USED	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 16.0	BOTTOM 20.0	TOP	BOTTOM
PIEZOMETER TIP	20.5			
BOTTOM OF BOREHOLE	20.5			
GWL AFTER INSTALLATION	7.41 @ TOC			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS Wood plug used in auger bit during well installation

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS (OU-1)		
BORING NUMBER: 1767 (PIT 1)	COORDINATES:		DATE: 6-25-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6-25-91
ENGINEER/GEOLOGIST: HARRIS/GARMAN	Depth	Date/Time	DATE COMPLETED: 7-2-91
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 1 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN.)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
1	63001 6-25 1445	7	6	DENSE (2.5Y, 5/4) LIGHT OLIVE BROWN CLAYEY SILT. TRACE FINE GRAVEL. ROOTLETS. DRY.	ML	NA	NA	HNU 0; α 0; BΥ 5000
	63002 6-25 1445	20	6	DENSE (2.5Y, N5/) GRAY ASH-LIKE MATERIAL WITH A WAXY CONSISTENCY. CLAY-SIZED PARTICLES. NO MEASURABLE PLASTICITY. (TRACES OF GREEN SALT). MOIST.	NA	NA	NA	HNU 0; α 0; BΥ 2600
	63003 6-25 1445	14	0	NR	NA	NA	NA	HNU NA; α NA; BΥ NA
HSL VOA 2	63004 6-25 1500	11	6	MEDIUM DENSE (7.5YR, N6/) GRAY AND REDDISH PURPLE MOTTLED ASH-LIKE POWDERY MATERIAL WITH A WAXY CONSISTENCY. CLAY-SIZED PARTICLES. NO MEASURABLE PLASTICITY. MOIST.	NA	NA	NA	HNU 0; α 0; BΥ 1200
	63005 6-25 1500	15	6	SAA	NA	NA	NA	HNU 0; α 0; BΥ 1200
3	63006 6-25 1500	9	6	SAA	NA	NA	NA	HNU 0; α 0; BΥ 1200
	63007 6-25 1500	14	3	SAA	NA	NA	NA	HNU 0; α 0; BΥ 1800
4 5	63008 6-25 1510	SHELBY TUBE SAMPLE WAS PUSHED - NO BLOW COUNTS AVAILABLE	27	SHELBY TUBE PUSHED FROM 3.5 TO 6.0 FT. 27 INCHES RECOVERED. THE MATERIAL AT THE BOTTOM WAS AN ASH-LIKE POWDERY MATERIAL WITH A WAXY CONSISTENCY. COLOR WAS ~~AL~~ MU 6-25-91 MOTTLED GRAY, WHITE, BLACK, AND YELLOW. MOIST.	NA	NA	NA	HNU 0; α 0; BΥ 2000
6	63009 6-27 0840	2	6	VERY LOOSE WHITE CLAY-LIKE MATERIAL, TRACE BLACK GRANULES. NO MEASURABLE PLASTICITY. VERY MOIST.	NA	NA	NA	HNU 0; α 0; BΥ 10,000
7	63010 6-27 0840	1	0	NR				HNU NA; α NA; BΥ NA
	63011 6-27 0840	2	0	NR				HNU NA; α NA; BΥ NA

NOTES.

Drilling Contractor PENNSYLVANIA DRILLING CO.

Drilling Equipment SIMCO

Driller: E.W. GARDNER

ASST: K. MYERS

SAA = SAME AS ABOVE
NR = NO RECOVERY
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0 ppm
α = 0 cpm
BΥ = 140 cpm

NALD
A1/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER 602.25.91	PROJECT NAME. FMPC RI/FS (OU-1)		
BORING NUMBER 1767 (PIT 1)	COORDINATES.		DATE. 6-27-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6-25-91
ENGINEER/GEOLOGIST HARRIS / GARMAN	Depth	Date/Time	DATE COMPLETED 7-2-91
DRILLING METHODS. HOLLOW STEM AUGER			PAGE 2 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	NA WELL CONSTRUCTION	REMARKS
8, 9	63012 6-27 0855	SHELBY TUBE WAS PUSHED BLOW COUNTS NOT APPLICABLE	0	SHELBY TUBE PUSHED FROM 7.5 TO 10.0 FT. NO RECOVERY AFTER 2 ATTEMPTS	NA	NA		HNU NA, α NA, BY NA
10	63013 6-27 0905	1	6	VERY LOOSE (2.5Y, N6/) GRAY CLAY-SIZED MATERIAL. SOME WHITE POWDERY MATERIAL. NO MEASURABLE PLASTICITY. ~~WET~~ VERY MOIST. NG 6-27-91	NA	NA		HNU 0, α 0, BY 15,000
11	63014 6-27 0905	1	6	VERY LOOSE (2.5Y, N6/) GRAY SOUPY SLUDGE. (SIMILAR CONSISTENCY TO WILLIAM GIRDIN). SOME COARSE GRAVEL. WET.	NA	NA		HNU 0, α 0, BY 26,000
HSL VOA	63015 6-27 0905	1	6	SAA	NA	NA		HNU 0, α 0, BY 30,000
12	63016 6-27 0905	1	3	SAA	NA	NA		HNU 0, α 0, BY 28,000
13, 14	63018 6-28 0900	SHELBY TUBE WAS PUSHED BLOW COUNTS NOT APPLICABLE	0	SHELBY TUBE PUSHED FROM 12.0 TO 14.5 FT. NO RECOVERY AFTER 2 ATTEMPTS.	NA	NA		HNU NA, α NA, BY NA
15	63019 6-28 0920	2	6	VERY LOOSE (2.5Y, N7/) LIGHT GRAY CLAY-SIZED SOUPY MATERIAL, SOME SILT AND SAND, SOME FINE GRAVEL. NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0, α 0, BY 22,000

NOTES.

Drilling Contractor PENNSYLVANIA DRILLING CO.

Drilling Equipment SIMCO

Driller: E.W. GARDNER

ASST: K. MYERS

SAA = SAME AS ABOVE
NR = NO RECOVERY
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0 PPM
α = 0 cpm
BY = 80-140 cpm

NALD
RI/FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS (OU-1)		
BORING NUMBER: 1767 (PIT 1)	COORDINATES:		DATE: 6-28-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6-25-91
ENGINEER/GEOLOGIST: GARMAN/HARRIS	Depth	Date/Time	DATE COMPLETED: 7-2-91
DRILLING METHODS: HOLLOW STEM AUGER			PAGE 3 OF 6

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6/N)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	NA WELL CONSTRUCTION	REMARKS		
15	63020 6-28 0920	2	6	SAA	NA	NA		HNU 0	α 0	BY 22,000
HSL VOA	63021 6-28 0920	0	3	VERY LOOSE (2.5Y, N7/) LIGHT GRAY SOUPY CLAY-SIZED MATERIAL WITH NEARLY 50% SILT, SAND AND GRAVEL. NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0	α 0	BY 22,000
16	63022 6-28 0930	1	6	VERY LOOSE LIGHT GREENISH GRAY SOUPY CLAY-SIZED MATERIAL. (HAS FOAMY, MERENGUE-LIKE APPEARANCE). ~40% SILT, SAND AND GRAVEL. NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0	α 0	BY 25,000
	63023 6-28 0930	2	6	SAA	NA	NA		HNU 0	α 0	BY 25,000
17 CLP VOA	63024 6-28 0930	2	6	SAA	NA	NA		HNU 0	α 0	BY 24,000
	63025 6-28 0940	2	6	VERY LOOSE (2.5Y, N8/) MOTTLED WHITE, GRAY, AND BLACK SOUPY CLAY-SIZED MATERIAL, SOME COARSE SAND AND GRAVEL (BLACK). NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0	α 0	BY 24,000
18	63026 6-29 0925	1	6	VERY LOOSE (5Y, 6/1) GRAY SILTY MATERIAL. SOME CLAY. TRACE BLACK GRAVEL. SOME WOOD CHIPS. NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0	α 0	BY 15,000
	63027 6-29 0940	4	5	VERY LOOSE (2.5Y, N6/) GRAY CLAYEY, SANDY SILT. TRACE FINE GRAVEL. NO MEASURABLE PLASTICITY. WET.	NA	NA		HNU 0	α 0	BY 22,000
19	63028 6-29 0950	3	6	VERY LOOSE (2.5Y, N6/) GRAY SANDY SILT. SOME FINE TO COARSE GRAVEL. TRACE CLAY. WET.	NA	NA		HNU 0	α 0	BY 33,000
	63029 6-29 1520	2	6	VERY LOOSE (2.5Y, N5/) GRAY CLAYEY SILT. SOME FINE TO COARSE BLACK GRAVEL. TRACE GREEN MATERIAL. PIECES OF STRING. VERY MOIST.	NA	NA		HNU 0	α 0	BY 23,000
20	63030 6-29 1530	3	5	VERY LOOSE (2.5Y, N5/) GRAY COARSE GRAVEL SOME SANDY SILT. TRACE CLAY. VERY MOIST.	GM	NA		HNU 0	α 0	BY 22,000
VER 21	63031 6-29 1540	20	6	(20.5 TO 20.7 FT - SAA) 20.7 TO 21.0 FT - VERY HARD (2.5Y, 5/2) GRAYISH BROWN CLAY, SOME SILT. TRACE FINE GRAVEL. LOW PLASTICITY. LOW MOISTURE.	GM CL	NA >4.0		HNU 0	α 0	BY 20,000
				BOTTOM OF BORING AT 21.0 FT. PIEZOMETER INSTALLED						

NOTES.

Drilling Contractor: PENNSYLVANIA DRILLING CO.

Drilling Equipment: SIMCO

Driller: E. W. GARDNER

Asst: K. MYERS

SAA = SAME AS ABOVE
NR = NO RECOVERY
NA = NOT APPLICABLE

BACKGROUND READINGS:
HNU = 0 ppm
α = 0 cpm
BY = 80-140 cpm

FERNALD RI/FS

COMPOSITE SAMPLING DIAGRAM

3 INTERVAL BOREHOLE

PROJECT NAME	FMPC RI/FS OU-1	BORING NUMBER	1767
PROJECT NUMBER	602.25.91	BORING LOCATION	PIT NO. 1
DATE COLLECTED	6-25, 6-27, 6-28, 6-29, 6-30, 7-2-91		

INTERVAL 1

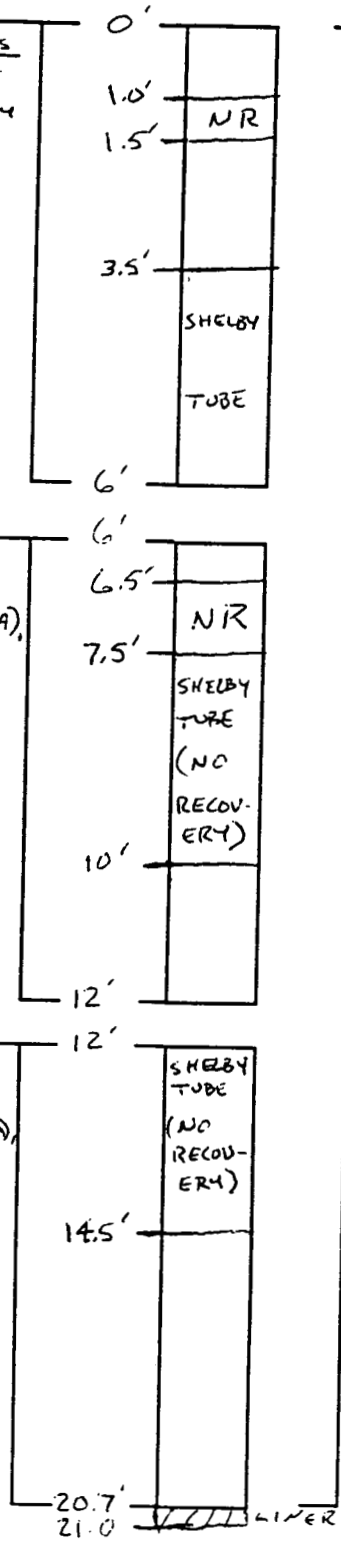
COMPOSITE SAMPLES SAMPLE NUMBER	ANALYSES
63034	ARCHIVE
63038	TREATABILITY

INTERVAL 2

COMPOSITE SAMPLES SAMPLE NUMBER	ANALYSES
63017	FULL RAD, FULL MSL (LESS VOA), SCREEN
63035	ARCHIVE
63039	TREATABILITY

INTERVAL 3

COMPOSITE SAMPLES SAMPLE NUMBER	ANALYSES
63032	FULL RAD, FULL MSL (LESS VOA), SCREEN
63036	ARCHIVE
63040	TREATABILITY



ENTIRE BOREHOLE

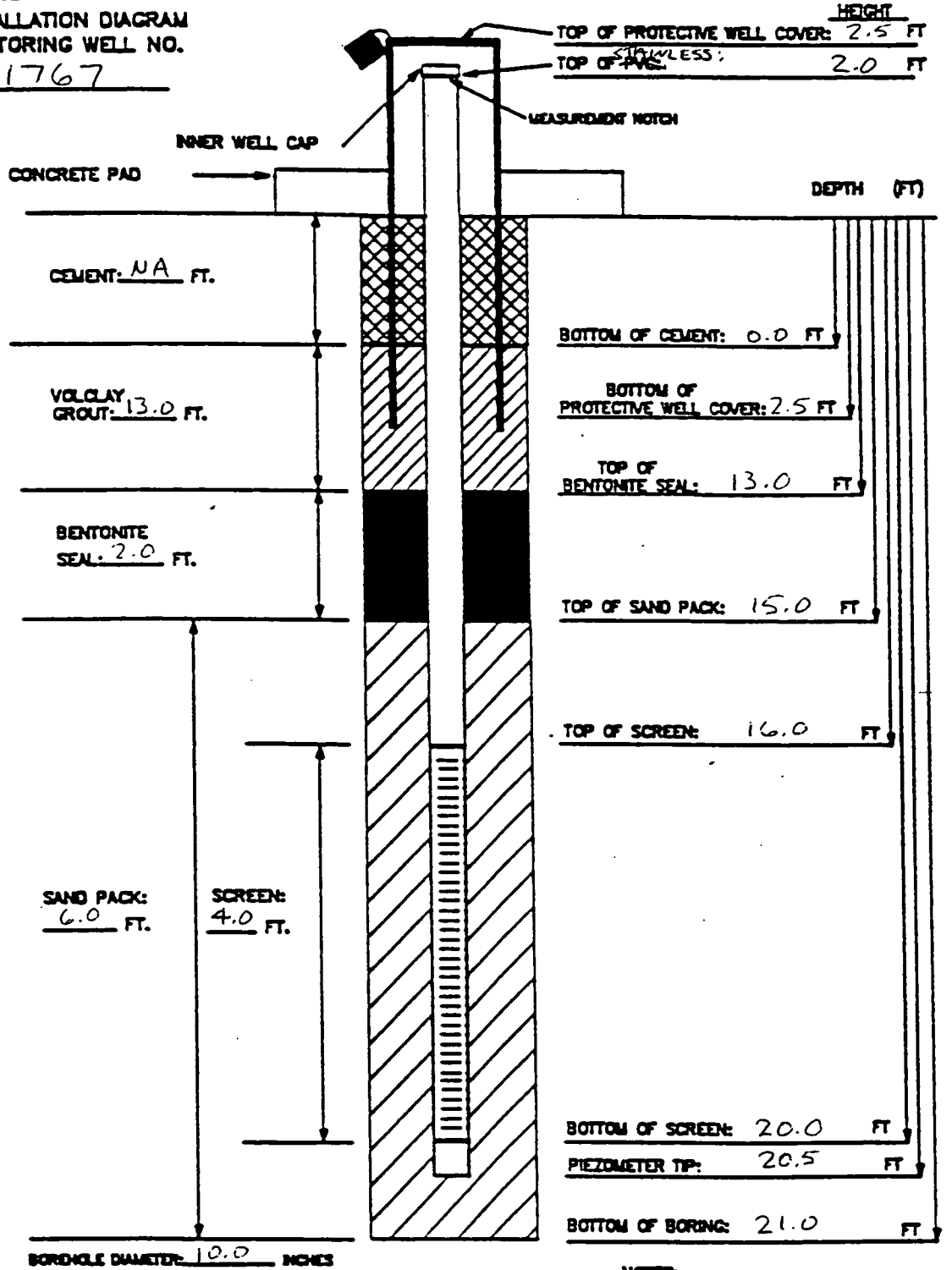
COMPOSITE SAMPLES SAMPLE NUMBER	ANALYSES
63033	FULL RAD, TCLP (LESS VOA), GRAIN SIZE ANALYSIS, TOC, URANIUM DIFFERENTIAL LEACHING, SCREEN
63037	ARCHIVE
(B-1767 DRUM #1)	TREATABILITY/ ARCHIVE
63078	TREATABILITY

ASI FORM 0020 REV.(0) 06-13-91
MORA_CSD3.DRW_FND

INSTALLATION DATE: 7/2/91

FERNALD RI/FS

INSTALLATION DIAGRAM
MONITORING WELL NO.
1767



BOREHOLE DIAMETER: 10.0 INCHES

MATERIALS USED:

SAND TYPE AND QUANTITY: 2-80 lb. BAGS 16/20
BENTONITE PELLETS (5-GALLON BUCKETS): 1
BAGS OF VOLCLAY GROUT: 2-50 lb. BAGS
AMOUNT OF CEMENT: NONE USED
AMOUNT OF WATER USED: 2 GAL.
OTHER: 3'x3' CONCRETE PAD WILL BE INSTALLED

NOTES:

1) RISER PIPE IS ~~2-INCH SCHEDULE 40 PVC PIPE, FLUSH-THREADED JOINTS.~~ 4" I.D. STAINLESS STEEL MG 7-2-91
2) SCREEN IS ~~2-INCH I.D. SCHEDULE 40 PVC PIPE WITH 0.020-INCH SLOTS.~~ 4" I.D. STAINLESS STEEL
3) LOWER END OF SCREEN IS CAPPED WITH AN END CAP OR THREADED SUMP.
4) WATER DEPTH/DATE: 6.65' @ TOC 7-11-91

TASK: 602.25.91

GEOLOGIST/ENGINEER: [signature]

NALD
RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS (OU-1) FIELD ENG./GEO. HARRIS/GARMAN DATE 7-2-91
PROJECT NO. 602.25.91 CHECKED BY _____ DATE _____
BORING NO. 1767
PIEZOMETER NO. 1767 DATE OF INSTALLATION 7-2-91

BOREHOLE DRILLING

DRILLING METHOD HOLLOW STEM AUGER
DRILLING FLUID (S) USED:
FLUID NONE FROM ~~FROM~~ _____ TO ~~TO~~ _____
FLUID NONE FROM ~~FROM~~ _____ TO ~~TO~~ _____

TYPE OF BIT AUGER
CASING SIZE (S) USED:
SIZE NONE FROM ~~FROM~~ _____ TO ~~TO~~ _____
SIZE NONE FROM ~~FROM~~ _____ TO ~~TO~~ _____

PIEZOMETER DESCRIPTION

TYPE MONITOR WELL
DIAMETER OF PERFORATED SECTION 4.0 IN. I.D.
PERFORATION TYPE:
SLOTS ☒ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS 0.01 IN
TOTAL PERFORATED AREA 4.0 FT.

RISER PIPE MATERIAL 316 STAINLESS STEEL
RISER PIPE DIAMETERS:
O.D. 4 3/8 IN. I.D. 4.0 IN.
LENGTH OF PIPE SECTIONS 10.0', 5.0', 2.0', 1.0'
JOINING METHOD FLUSH JOINT THREADED

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5.0 FT.
PROTECTIVE PIPE O.D. 10 3/4 IN.

OTHER PROTECTION HINGED LOCKING COVER W/ PADLOCK

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 0.0	BOTTOM 13.0	TOP	BOTTOM
BENTONITE	TOP 13.0	BOTTOM 15.0	TOP	BOTTOM
SAND	TOP 15.0	BOTTOM 21.0	TOP	BOTTOM
GRAVEL NONE USED	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 16.0	BOTTOM 20.0	TOP	BOTTOM
PIEZOMETER TIP	20.5			
BOTTOM OF BOREHOLE	21.0			
GWL AFTER INSTALLATION	6.65 @ TOC			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒
REMARKS WOOD PLUG USED IN AUGER BIT DURING INSTALLATION TO CONTROL/PROHIBIT FLOW OF WASTE PIT MATERIALS INTO THE AUGERS.

ANALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS OU-1 (BURN PIT)		
BORING NUMBER: 1777	COORDINATES:		DATE:
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: Harris / Mulder	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS: Hollow Stem Auger			PAGE 1 OF 1

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	63121 7/27 1230	19	6	HARD (10YR 6/6) BROWN YELLOW CLAY LOW COHESION NO PLASTICITY, VERY DRY	CL	3.5		HNU 0 / α 0 / BZ 1000
1	63122 7/27 1230	32	6	SAA				HNU 0 / α 0 / BZ 1000
	63123 7/27 1230	52	6	SAA				HNU 0 / α 0 / BZ 1000
	63124 7/27 1230	30	0	NR				HNU NA / α NA / BZ NA
2	63125 7/27 1240	35	6	HARD (10YR 6/6) BROWN YELLOW CLAY NO COHESION, NO PLASTICITY, VERY DRY	CL	3.5		HNU 0 / α 0 / BZ 100
	63126 7/27 1240	20	0	NR				NA / NA / NA
3	63127 7/27 1240	19	0	NR				NA / NA / NA
	63128 7/27 1240	11	0	NR				NA / NA / NA
4	63129 7/27 1315	15	6	HARD (10YR 6/6) BROWN YELLOW CLAY INTERSPERSED WITH FINE GRAVEL, LOW COHESION LOW PLASTICITY, DRY				HNU 0 / α 0 / BZ 100
	63130 7/27 1315	22	6	DENSE (5Y 2.5/1) BLACK SILTY SAND PROBABLY FLY ASH & SLAG, LOW COHESION; LOW PLASTICITY, SLIGHTLY MOIST				HNU 0 / α 0 / BZ 100
5	63131 7/27 1315	22	6	SAA				HNU 0 / α 0 / BZ 100
	63132 7/27 1330	23	6	DENSE (5Y 2.5/2) BLACK SANDY SILT LOW COHESION & PLASTICITY, DRY				HNU 0 / α 0 / BZ 1000
6	63133 7/27 1330	25	6	SAA				HNU 0 / α 0 / BZ 1200
	63134 7/27 1330	18	6	SAA				HNU 0 / α 0 / BZ 1500
7	63135 7/27 1400	5	6	MEDIUM DENSE (5Y 2.5/1) BLACK SANDY SILT. LOW COHESION & PLASTICITY. LOOKS LIKE ASH. SLIGHTLY MOIST.				HNU 0 / α 0 / BZ 100

NOTES.

Drilling Contractor: Penn Drill

Drilling Equipment: Simco

Driller: E. Gardner

ASS: K. Myers

ALD
A/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: EMPC RI/FS OU-1 (BURN-PIT)		
BORING NUMBER: 1777	COORDINATES:		DATE:
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-27-91
ENGINEER/GEOLOGIST: HARRIS/MULDER	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS: HOLLOW STEM AUGER			PAGE OF

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6,6,6)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
8	63136 7/27 1400	7	6	SAA				HNU 0 / α 0 / BZ 100
	63137 7/27 1400	9	6	SAA				HNU 0 / α 0 / BZ 100
9			0					
10								
11	63138 7/27 1430	9	6	DENSE (5Y 2.5/1) BLACK SANDY SILT WITH SPARSE FINE GRAVEL. LOW COHESION, NO PLASTICITY. MOIST.				HNU 0 / α 0 / BZ 100
	63139 7/27 1430	11	6	SAA				HNU 0 / α 0 / BZ 100
12	63140 7/27 1430	5	6	SAA				HNU 0 / α 0 / BZ 100
	63141 7/27 1430	32	6	DENSE ( ) BROWNISH GRAY COARSE SANDY SILT WITH SPARSE FINE GRAVEL. MODERATE COHESION. MODERATE PLASTICITY.				HNU 0 / α 0 / BZ 125
13	63142 7/27 1545	23	6	DENSE (10YR 4/1) DARK GRAY COARSE SAND WITH GRAVEL. LOW COHESION & PLASTICITY VERY MOIST				HNU 0 / α 0 / BZ 150
	63143 7/27 1545	27	6	DENSE ( ) OLIVE BROWN COARSE SAND WITH SPARSE COARSE GRAVEL. LOW COHESION & PLASTICITY. WET.				HNU 0 / α 0 / BZ 150
14	63144 7/27 1600	3	6	SAA -				HNU 0 / α 0 / BZ
	63145 7/27 1600	5	0	NR				HNU NA / α NA / BZ

NOTES.

Drilling Contractor: PENN DRILL

Drilling Equipment: SIMCO

Driller: E. GARDNER

ASST. K. MYERS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: FMPC RI/FS OU-1 (BURN-PIT)		
BORING NUMBER: 1777	COORDINATES:		DATE:
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-27-91
ENGINEER/GEOLOGIST: HARRIS, MULDER	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS: HOLLOW STEM AUGER			PAGE OF

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 6"	RECOVERY (")	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (tsf)	WELL CONSTRUCTION	REMARKS
15.0	63146 7/27 1615	15	0	A ROCK WAS JAMMED IN THE SHOE OF THE SPOON.				
	63147 7/27 1625	16	0					
16	63148 7/27 1630	21	0					
	63149 7/27 1640	15	0					
17	63150 7/27 1645	3	0					
	63151 7/28 0830	4	6	LOOSE (54 25/2) BLACK COARSE SAND WITH FINE GRAVEL. NO MEASURABLE COHESION OR PLASTICITY. VERY WET.				HNU 0 α 0 Bi 4200
18	63152 7/28 0830	3	0	NR				
	63153 7/28 0830	2	0	NR				
19	63154 7/28 0845	1	2	LOOSE - GRAVEL & OTHER DEBRIS GLASS, CERAMIC, STYROFOAM, METAL				
	63155 7/28 0845	4	0					
20	63156 7/28 0845	5	0					
	63157 7/28 0850	2	0	VERY LOOSE (24 25/1) BLACK FINE GRAVEL WITH COARSE SAND. DEBRIS - GLASS, ALUMINUM, WOOD.				HNU 0 α 0 Bi 38-W
21	-	5	0					
	63158 7/28 0900	2						
22	63159 7/28 0900	1						

NOTES.

Drilling Contractor: PENN DRILL

Drilling Equipment: SIMCO

Driller: E. GARDNER

ASST. K. MYERS

/ALD
//FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.25.91	PROJECT NAME: RMPC N/FS OU-1 (Burn Pit)	
BORING NUMBER: 1777	COORDINATES:	DATE:
ELEVATION:	GWL: Depth / Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: Harris / Mulder	Depth / Date/Time	DATE COMPLETED:
DRILLING METHODS: Hollow Stem Auger		PAGE OF

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6")	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
	4	1	0	NR				
23								
		2	0	NR				
		2	0	NR				
24								
		2	0	NR				
		1	0	NR				
25								
		1	0	WELL SET AT 26'				
		1	0					
26								

NOTES.

Drilling Contractor: Penn Drilling

Drilling Equipment: Simco

Driller: E Gardner

Asst. K Myers

/ALD
/FS

2126

VISUAL CLASSIFICATION OF SOILS

J.C 7-26-91

PROJECT NUMBER: ~~1731~~ 602.26.91	PROJECT NAME: FMPC RI/FS OU-2		
BORING NUMBER: 1721	COORDINATES:		DATE: 7-26-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-26-91
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED: 7-28-91
DRILLING METHODS: Auger Mobile 53			PAGE 1 OF 4

S.A.A. Same as Above

N.R. No Recovery

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	67228 1500 7-26-91	17 39 28	18	V. Hard, brown (10yr, 5/3) silty clay, some cobbles, V. low plasticity, dry.	CL	4.5	Hnu - 0 ppm BD - 150-200cpm α - 2 cpm
2 3	67229 1505 7-26-91	14 21 19	8	S.A.A. add Hard, sl. moist	CL	3.0	Hnu - 0 ppm BD - 100cpm α - 0cpm
4	67230 1510 7-26-91	17 14 11	12	Hard, light olive brown, (2.5Y, 5/4) silty clay, Trace gravel, low to med. plast. moist	CL	2.5	Hnu - 1-3 ppm BD - 100cpm α - 0cpm
5 6	67231 1515 7-26-91	10 9 7	0	N.R	NA	NA	NA
7	67232 1600 7-26-91	1 10 12	0	N.R	NA	NA	NA
8 9	67233 1605 7-26-91	14 15 17	5	Soft, very dark gray, (5Y, 3/1) silty clay, trace sand, med plast., moist to wet.	CL	.50	Hnu - 1-3 ppm BD - 100 cpm α - 0cpm
10	67234 1610 7-26-91	10 17 18	16	Soft, olive gray. (5Y, 4/2) silty clay. trace sand med plast., moist. Firm, very dark gray. (5Y, 3/1) silty clay, trace sand med plast. moist	CL CL	.25 1.0	Hnu - 1-3 ppm BD - 100 cpm α - 0cpm
11 12	67235 1615 7-26-91	20 22 21	0	N.R	NA	NA	NA
13	67236 1030 7-27-91	21 20 24	16	Firm. olive gray (5Y. 4/2) silty clay med plast. moist. 12.6' Firm. yellowish brown. (10yr. 5/6) silty clay trace sand, trace gravel, sl. moist. low plast.	CL CL	1.5 1.5	Hnu - < 1.0 ppm BD - 80-100cpm α - 0cpm
14 15	67237 1035 7-27-91	13 10 11	8	Firm. gray to yellowish brown (10yr. 5/1 to 10yr 5/6) mottled silty clay, trace sand & gravel, moist.	CL	1.0	Hnu - 0 ppm BD - 80 cpm α - 0 cpm

NOTES:

Drilling Contractor Penn Drilling

Drilling Equipment Mobile 53 Auger

Driller: Bob Yost.
Mark Rebold

Background
Hnu - 0 ppm
BD - 80-200cpm
α - 0cpm

Landfill Liner Bpp. 12.5'

68

243B-3-86

/ALD
/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS OU-2	
BORING NUMBER: 1721	COORDINATES:	DATE: 7-28-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-26-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 7-28-91
DRILLING METHODS: Mobile 53 Auger		PAGE 2 OF 4

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	67238 1030 7-28-91	3 7 10	10	Firm, brown (10yr, 5/3) silty clay, Trace sand, Trace Gravel, moist. low plasticity	CL	2.0	Hnu - 0 ppm Bg - 80 cpm α - 0 cpm
17	~~67239~~ 7-28-91			Landfill Ends at App. 12.5' Boring Ends at 16.5' No water encountered, Boring plugged and Abandoned			
18	~~67242~~						
19	J.L.			67242 - Archive 67243 - Field Blank 67244 - Ignite etc. 67245 - TCLP 67246 - SPLP 67247 - TCLP Drum			
20	~~67245~~						
21							
				All samples taken. According to the HSC Sampling plan & Sanitary landfill Sample addendum			

NOTES:

Drilling Contractor: Penn Drilling

Drilling Equipment: Mobile 53 Auger

Driller: Bob Wood
Rich Anderson

Background
Hnu - 0 ppm
Bg - 80-200 cpm
α - 0 cpm

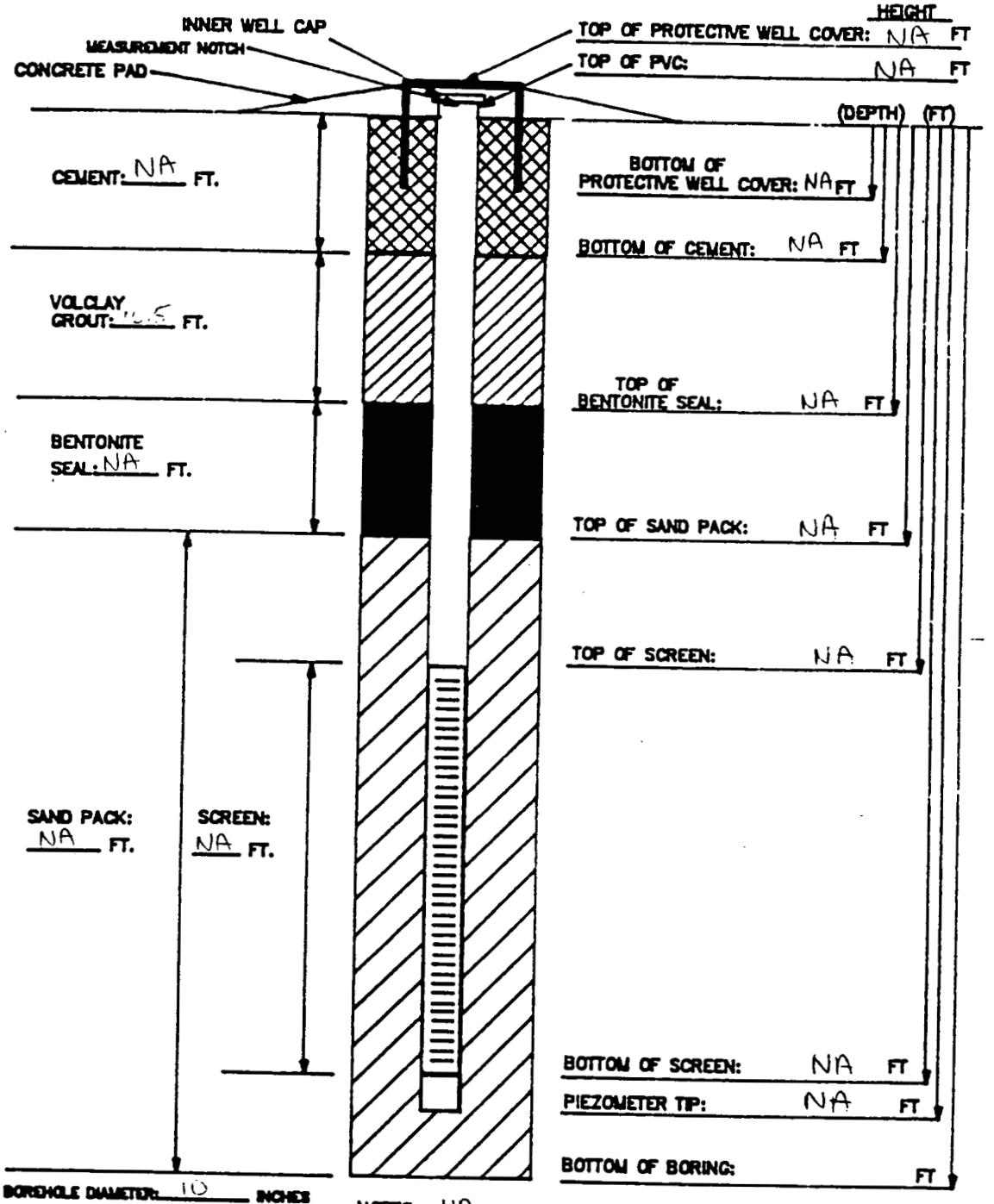
243B-3-86

FERNALD RI/FS

INSTALLATION DIAGRAM

~~MONITORING WELL~~ BORING NO. 1721

INSTALLATION DATE: 7-28-92 2126



BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:

SAND TYPE AND QUANTITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1/2
AMOUNT OF CEMENT: NA
AMOUNT OF WATER USED: 55gals
OTHER: NA

NOTES: NA

1) RISER 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 SUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: GCA.9691 GEOLOGIST/ENGINEER: J. Lear

ALD
/FS

4/4 2126

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC R1/FS FIELD ENG./GEO. J Lear DATE 7-28-91
PROJECT NO. 602.26.91 CHECKED BY DATE
BORING NO. 1228
PIEZOMETER NO. NA DATE OF INSTALLATION 7-28-91

BOREHOLE DRILLING

DRILLING METHOD Auger
DRILLING FLUID (S) USED:
FLUID NA ~~FROM~~ ~~TO~~
FLUID NA ~~FROM~~ ~~TO~~

TYPE OF BIT 10 in Hollow Auger
CASING SIZE (S) USED:
SIZE NA ~~FROM~~ ~~TO~~
SIZE NA ~~FROM~~ ~~TO~~

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE: NA
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE ( )		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 16.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	NA			
GWL AFTER INSTALLATION	NA			

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

REMARKS

ALD
FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 1724	COORDINATES:	DATE 7-12-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-12-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: 53 Mobile Auger		PAGE 1 OF 6

S.A.A. - Same as above
N.R. No Recovery

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	67190 1430 7-13-91	2 4 6	18	loose, black (2.5Y, 2/) silt, trace sand trace gravel, dry	ML	NA	Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
2	67191 1435 7-13-91	6 6 9	18	S.A.A. add med dense			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
3 4	67192 1440 7-13-91	9 7 7	18	med. dense, black, to very dark gray, 2.5Y 2/) to 10YR. 3/1) some sand, some gravel, dry.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
5 6	67193 1445 7-13-91	15 15 13	18	med. dense, black, (2.5Y, 2/) silt, trace sand, Trace gravel dry.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
7	67194 1520 7-13-91	14 14 13	18	S.A.A.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
8 9	67195 1525 7-13-91	10 8 10	18	S.A.A.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
10	67196 1530 7-13-91	7 8 8	18	S.A.A.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
11 12	67197 1535 7-13-91	6 6 6	14	med. dense, black, (2.5Y, 2/) silt, trace sand & Gravel, Trace brown (10YR, 5/3) clayey silt.			Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
13 14	67199 0930 7-14-91	N.A.	30	med dense, black (2.5Y, 2/) silt, trace sand, Trace gravel, dry.	ML	NA	Hnu - 0 ppm Bγ - 80-100cpm α - 0cpm
15							

NOTES:
Drilling Contractor - Penn Drilling
Drilling Equipment - Mobile 53 Auger
Driller - Bob Yost
Asst - Bill Anderson

Background
Hnu - 0 ppm
Bγ - 80-100 cpm
α - 0cpm

402-11-86

ALD
/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-26.91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 1724	COORDINATES:	DATE: 7-14-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-13-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Mobile 53 Auger		PAGE 2 OF 6

DEPTH (Ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				S.A.A. Same as above N.R. - No recovery			
15 16	67200 0935 7-14-91	8 5 3	16	loose, black, (2.5Y, 2/) silt, trace sand, trace gravel, dry	ML	NA	Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
17	67201 0940 7-14-91	7 4 4	17	S.A.A.			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
18 19	67202 0945 7-14-91	3 3 3	18	S.A.A.			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
20	67203 0950 7-14-91	2 4 4	18	S.A.A.			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
21 22	67204 0915 7-14-91	3 3 5	18	S.AA			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
23	67205 0920 7-15-91	4 4 4	18	loose, black, (2.5Y, 2/) silt, some sand trace gravel, dry			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
24 25	67206 0925 7-15-91	3 4 3	18	S.A.A.			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
26	67207 0930 7-15-91 ~~67207~~ J.L.	5 4 7	18	medium dense, (2.5Y, 2/) silt, trace sand trace gravel, ~~moist~~ 7-15-91, dry			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
27 28	67208 1000 7-15-91	6 3 2	18	S.A.A.			Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm
29	67209 1005 7-15-91	5 2 2	18	S.A.A.	V ML	✓ NA	Hnu - 0 ppm Bq - 80-100 cpm α - 0 cpm

NOTES:

Drilling Contractor Penn Drilling

Drilling Equipment Mobile 53 Auger

Driller: Bob Yost
Bill Anderson

Hnu - 0 ppm
Bq - 80-100 cpm
α - 0 cpm
Background

2438-3-86

ALD
A/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS OU-2		
BORING NUMBER: 1724	COORDINATES:		DATE: 7-15-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-13-91
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS: 53 Mobile Auger			PAGE 3 OF 6

S.A.A. - Same ~~as~~ above

N.R. No Recovery

DEPTH (Ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30–31	67210 1010 7-15-91	3 4 4	16	S.A.A.	ML	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
31–32	67211 1015 7-15-91	2 2 5	16	31.5 S.A.A S.A.A. add trace organics, Sl. moist.	ML	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
33–34	67212 1045 7-15-91	10 10 11	16	S.A.A add med dense.			Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
35–36	67213 1050 7-15-91	6 6 7	16	S.A.A.			Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
36–37	67214 1055 7-15-91	4 4 3	14	loose, black (2.5Y. 2/1) silt, alternating with brown, (10yr 5/3) clayey silt trace sand and gravel, Sl. moist.	ML	NA	Hnu - 0 ppm Bb 80-100cpm α - 0cpm
38	67215 1100 7-15-91	2 2 3	0	N.R.	NA	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
39–40	67216 0900 7-16-91	7 10 8	0	N.R.	NA	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
41	67217 0905 7-16-91	5 5 8	10	firm, dark yellowish brown, (10yr, 4/6) sandy clay trace gravel, med plast. moist	CL	.75	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
42–43	67218 0910 7-16-91	9 13 13	14	S.A.A.	CL	.75	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
44	67219 0915 7-16-91	12 10 13	0	N.R.	NA	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm

NOTES:

Drilling Contractor: Penn Drilling

Drilling Equipment: Mobile 53 Auger

Driller: Bob Yost
Bill Anderson

Background
Hnu - 0 ppm
Bb - 80-100cpm
α - 0 cpm

2438-3-86

XLD
FS

2126
4/6

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602-26-91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 6724	COORDINATES:	DATE 7-15-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-12-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 7-16-91
DRILLING METHODS: Mobile 53 Auger		PAGE 4 OF 6

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				~~67177~~ - J.L			
				67220 - 5gal Geotech bucket			
				67221 - Archive			
				67222 - SRCP			
				67223 - Tg corr etc.			
				67224 - TCLP			
				67225 - TCLP Drum			
				67198 - Field Blank			
				Composite and Drum Sample Nos.			
				Drilling and Sampling Ends at 44.5 ft Fly Ash Ends at - App. 38' Samples Taken According to the OU-2 Sampling Plan			

NOTES:

402-11-86

FERNALD RI/FS

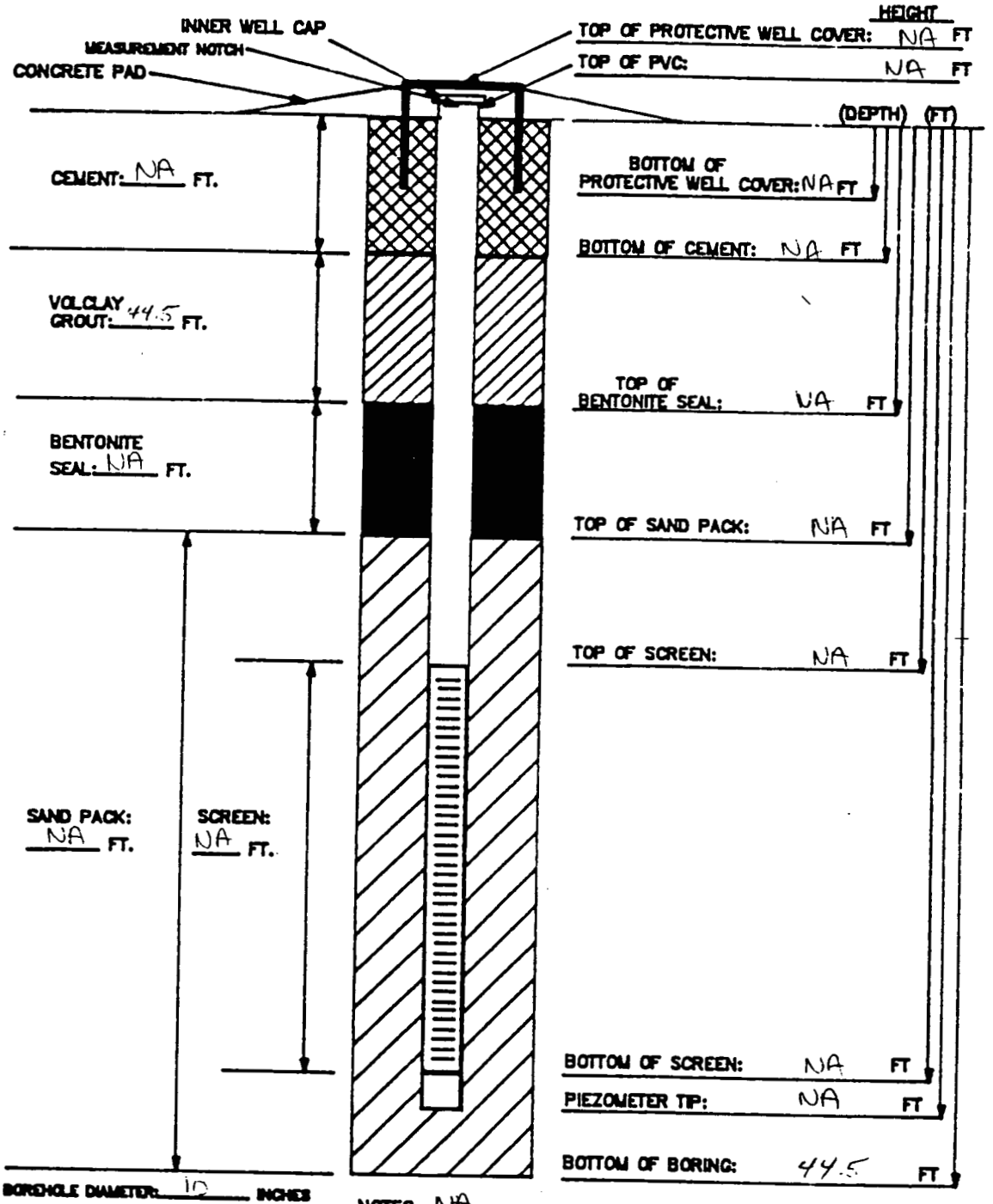
INSTALLATION DIAGRAM

~~MONITORING~~ BORING WELL NO. 1724

7-16-91

INSTALLATION DATE: 7-16-91

2126



BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:

SAND TYPE AND QUANTITY: NA

BENTONITE PELLETS (5-GALLON BUCKETS): NA

BAGS OF VOLCLAY GROUT: 9

AMOUNT OF CEMENT: NA

AMOUNT OF WATER USED: 75 gals

OTHER: NA

NOTES: NA

1) RISER 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 SUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESIS INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 602.2691

GEOLOGIST/ENGINEER: J. Lear

ALD
I/FS

2126

PIEZOMETER INSTALLATION SHEET

PROJECT NAME PMPC RI/FS
PROJECT NO. 1602.26.91
BORING NO. 1724
PIEZOMETER NO. NA

FIELD ENG./GEO. J Lear DATE 7-16-91
CHECKED BY DATE
DATE OF INSTALLATION 7-16-91

BOREHOLE DRILLING

DRILLING METHOD AUGER
DRILLING FLUID (S) USED:
FLUID NA FROM TO
FLUID NA FROM TO

TYPE OF BIT 10 in Hollow AUGER
CASING SIZE (S) USED:
SIZE NA FROM TO
SIZE NA FROM TO

PIEZOMETER DESCRIPTION

TYPE NA
DIAMETER OF PERFORATED SECTION NA
PERFORATION TYPE: NA
SLOTS ☐ HOLES ☐ SCREEN ☐
AVERAGE SIZE OF PERFORATIONS NA
TOTAL PERFORATED AREA NA

RISER PIPE MATERIAL NA
RISER PIPE DIAMETERS:
O.D. NA I.D. NA
LENGTH OF PIPE SECTIONS NA
JOINING METHOD NA

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA
PROTECTIVE PIPE O.D. NA

OTHER PROTECTION NA

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE ( )		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 44.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	NA			
GWL AFTER INSTALLATION	NA			

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

REMARKS

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ALD
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2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 502.26.91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 1722	COORDINATES:	DATE 7-30-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED 7-29-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 7-30-91
DRILLING METHODS: Mobile 53 Auger		PAGE 1 OF 4

	DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	1	67249 17000 7-29-91	9 37 46	16	V. dense, brownish yellow (10yr, 6/4) gravelly clay, some sand, V. Low plasticity, some organic. V. Dry	CL	NA	Hnu - 0 ppm Bγ - 150-200cpm α - 0cpm
Extend. HSL	2	67250 1705 7-29-91	27 23 12	14	Styraphore & woodchips 1.75' v. hard, dark yellowish brown to dark gray (10yr, 4/4) to (10yr, 4/1) silty clay. Some gravel low plasticity, damp	CL	4.5	Hnu - 10-50ppm Bγ - 8000cpm α - 20cpm
Full Rad	3 4	67251 1710 7-29-91	36 34 29	5	Hard, Olive gray (5y, 4/2) silty clay. Some gravel, low plast to med plast. sl. moist.	CL	3.75	Hnu - 5-10ppm Bγ - 10000-19000cpm α - 50-100cpm
	5 6	67252 1915 7-29-91	23 19 43	0	N.R.	NA	NA	Hnu, Bγ, α } NA
ED TOX	7	67253 1000 7-30-91	50/6	6	dark olive gray (5y, 3/2) mud, saturated 6.4' Limestone Augering to 8.0 ft			Hnu - 5-10ppm Bγ - 15000cpm α - 50-100cpm
	8 9	67254 1410 7-30-91	14 23 17	0	N.R.			Hnu, Bγ, α } NA
	10 11	67255 1420 7-30-91	13 15 19	0	N.R. Augering to 11.0'			Hnu, Bγ, α } NA
Full Rad	12	67256 67257 1530 7-30-91	6 6 13	14	m. dense, light yellowish brown, (10yr, 6/4) silt. Some cobbles, dry very stiff, yellowish brown to dark gray, (10yr 4/6) to (10yr, 4/2) silty clay, low to med plast, moist	ML CL	NA 2.5	Hnu - 0 ppm Bγ - 150cpm α - 0 cpm
Archive	13 14 15	67258 1598 7-30-91	10 11 15	16	m. dense, light yellowish brown (10yr, 6/4) silt, some cobbles, trace sand, dry	ML	NA	Hnu - 0 ppm Bγ - 150cpm α - 0cpm

NOTES:

Drilling Contractor: Penn Drilling
Equipment: Mobile 53 Auger
Driller: Bob Yost
Asst: Mark Rebold

Background
Hnu - 0 ppm
Bγ - 100-200cpm
α - 0cpm

*Land fill Liner Located at App 11.0'

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FERNALD RI/FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 1202.26.91.	PROJECT NAME: FMPC RI/FS OU-2		
BORING NUMBER: 1722	COORDINATES:		DATE: 7-30-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-29-91
ENGINEER/GEOLOGIST: J. Gear	Depth	Date/Time	DATE COMPLETED: 7-30-91
DRILLING METHODS: Mobile 53 Auger			PAGE 2 OF 4

DEPTH (Ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
EXH HSL 15	67259 1540 7-30-91	10 11 15	15	Very stiff yellowish brown to dark gray (10yr. 4/6) to (10yr. 4/2) silty clay, low to med plast. moist	CL	2.5	Hnu - 0 BG - 80-120 α - 0 cpm
16				Drilling & Sampling Ends at 15.5'. All samples taken According to OU-2 work Plan.			
				No Ample recovery to get second Sample interval thus. App IX switched to 1:1 interval.			

NOTES:

Drilling Contractor: Penn Drilling

Drilling Equipment: Mobile 53 Auger

Driller: Bob Yost
Mark Eebold

Background
Hnu - 0 ppm
BG - 150-200 cpm
α - 0 cpm

2438-3-86

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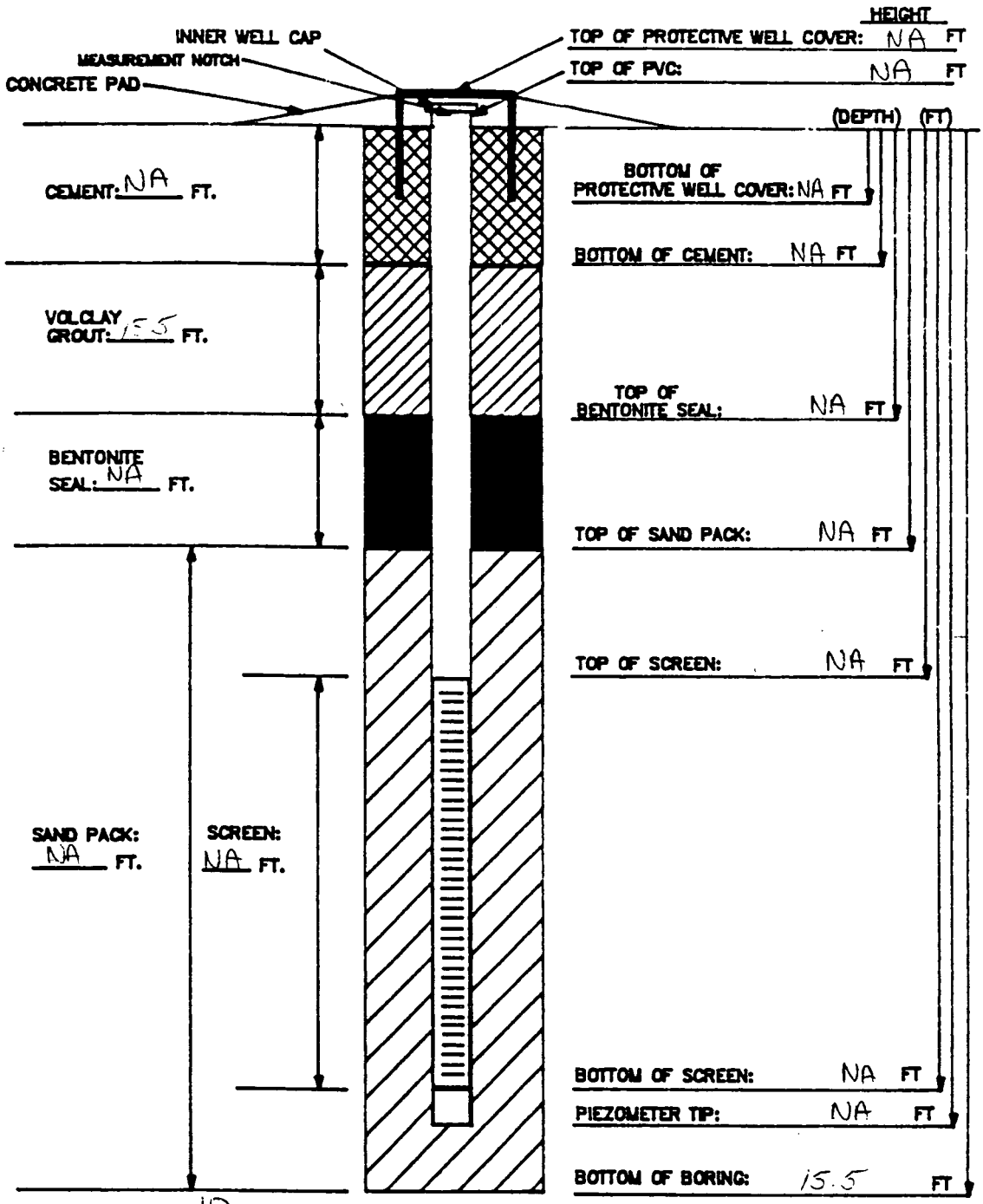
FERNALD RI/FS

INSTALLATION DIAGRAM

~~MONITORING WELL~~ NO. 1722 Boring

INSTALLATION DATE: 7-31-91 2126



BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:

SAND TYPE AND QUANITITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 1 1/2
AMOUNT OF CEMENT: NA
AMOUNT OF WATER USED: 55 gals
OTHER: NA

NOTES: NA

1) RISER 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 SUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 1002.2691 GEOLOGIST/ENGINEER: J. Gear

ERNALD
RI/FS

4/4 2126

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. J Lear DATE 7-31-91
PROJECT NO. 1002 26.91 CHECKED BY DATE
BORING NO. 1722
PIEZOMETER NO. 1722 DATE OF INSTALLATION 7-31-91

BOREHOLE DRILLING

DRILLING METHOD Auger	TYPE OF BIT 10 in Hollow Auger
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA ~~FROM~~ ~~TO~~	SIZE NA ~~FROM~~ ~~TO~~
FLUID NA ~~FROM~~ ~~TO~~	SIZE NA ~~FROM~~ ~~TO~~

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE ( )		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 15.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	NA			
GWL AFTER INSTALLATION	NA			

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

REMARKS

ACS-**-86

ANALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS OU-2	
BORING NUMBER: 1723	COORDINATES:	DATE: 7-11-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-11-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: mobile 53 Auger		PAGE 1 OF 5

S.A.A. - Same as Above

N.R. No Recovery

DEPTH (Ft.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	67164 0945 7-11-91	1 5 5	18	loose, black (2.5Y. 2/) S.H. Some sand trace gravel, Sl. moist.	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
2 3	67165 0950 7-11-91	8 14 15	18	S.A.A. add med dense	ML	NA	Hnu - 0ppm Bd - 80-100cpm α - 0cpm
4	67166 0955 7-11-91	10 11 12	18	4.0' S.A.A. Add. Trace clay	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
				medium dense, black, (2.5Y, 2/) Silt, Some gravel Trace sand Sl. moist	ML	NA	
5 6	67167 1000 7-11-91	10 10 10	18	med dense, black, (2.5Y, 2/) silt, Trace sand Trace gravel Sl. moist.	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
7	67168 1025 7-11-91	8 10 11	18	S.A.A.	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
8 9	67169 1030 7-11-91	11 12 15	18	S.A.A.	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
10	67170 1035 7-11-91	5 15 16	18	9.75' S.A.A. add dense	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
				Dense,	GL	NA	
11 12	67171 1040 7-11-91	16 16 13	18	med. dense, black (2.5Y, 2/) silt, trace sand, trace gravel, Sl. moist.	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
13	67172 1330 7-11-91	14 18 22	14	S.A.A. add dense	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm
14 15	67173 1335 7-11-91	11 12 15	16	S.A.A. add med. dense. add trace cobbles	ML	NA	Hnu - 0 ppm Bd - 80-100cpm α - 0cpm

NOTES:

Drilling Contractor Penn Drilling

Drilling Equipment Mobile 45 Auger

Driller: Bob Yost

Asst Bill Anderson

Background

Hnu - 0 ppm

Bd - 80-100cpm

α - 0 cpm

RNALD RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 1723	COORDINATES:	DATE 7-11-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-11-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 7-12-91
DRILLING METHODS: Mobile 53 Auger		PAGE 2 OF 5

S.A.A. - Same as above

N.R. No Recovery

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	67174 1540 7-11-91	10 12 14	18	S.A.A.	ML	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
17	67175 1345 7-11-91	8 5 5	18	S.A.A. Add loose No cobbles			Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
18 19	67176 1455 7-11-91	3 3 4	18	S.A.A.			Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
20 21	67177 1440 7-11-91	2 3 3	18	S.A.A			Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
22	67178 1445 7-11-91	2 3 3	10	N.R.	NA		Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
				loose, black (2.5y, 2/) silt, some sand, trace gravel moist	ML		
				loose, yellowish brown, (10yr. 4/6) silty clay, trace sand, low plasticity, moist.	CL		
23	67179 1450 7-11-91	4 6 9 9	18	N.R.	NA		Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
				m. dense, yellowish brown, (10yr. 4/6) silty clay, trace sand, low plasticity, moist.	CL		
24				m. dense, black (2.5y, 2/) silt trace sand, trace gravel, v. moist.	ML	V	
25 26	67181 1000 7-12-91	10 10 15	0	N.R	NA	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
27	67182 1005 7-12-91	15 11 7	18	Hard, dark yellowish brown, (10yr. 4/6) silty clay, some sand, low plast. moist.	CL	2.5	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm
28 29	67183 1010 7-12-91	3 5 11	0	N.R.	NA	NA	Hnu - 0 ppm Bb - 80-100cpm α - 0cpm

NOTES

402-11-86

ARNALD RI/FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.26.91	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 1723	COORDINATES:	DATE: 7-12-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-11-91
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time	DATE COMPLETED: 7-12-91
DRILLING METHODS: Mobile 53 Auger		PAGE 3 OF 5

DEPTH (Ft.) 29	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in.)	RECOVERY (in.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	67184 1015 7-12-91	11 17 16	18	Hard, dark yellowish brown, (10YR 4/6) sandy clay, trace gravel, med plast. moist.	CL	2.75	HNU - 0 ppm Bk - 80-100 cpm α - 0 cpm
				Drilling & Sampling ends at 30.5'. All samples taken According to OU-2 Work Plan.			
				67185 - SPLP 67186 - TCLP 67187 - Ig Equ. etc. 67188 - Archive 67189 - TCLP (Drum)			
				Fly Ash ends at App. 26.0'			

NOTES:

Drilling Contractor Penn Drilling

Drilling Equipment Mobile 53 Auger

Driller: Bob Yost
Bill Anderson

Background
HNU - 0 ppm
Bk - 80-100 cpm
α - 0 cpm

2438-3-86

4/5

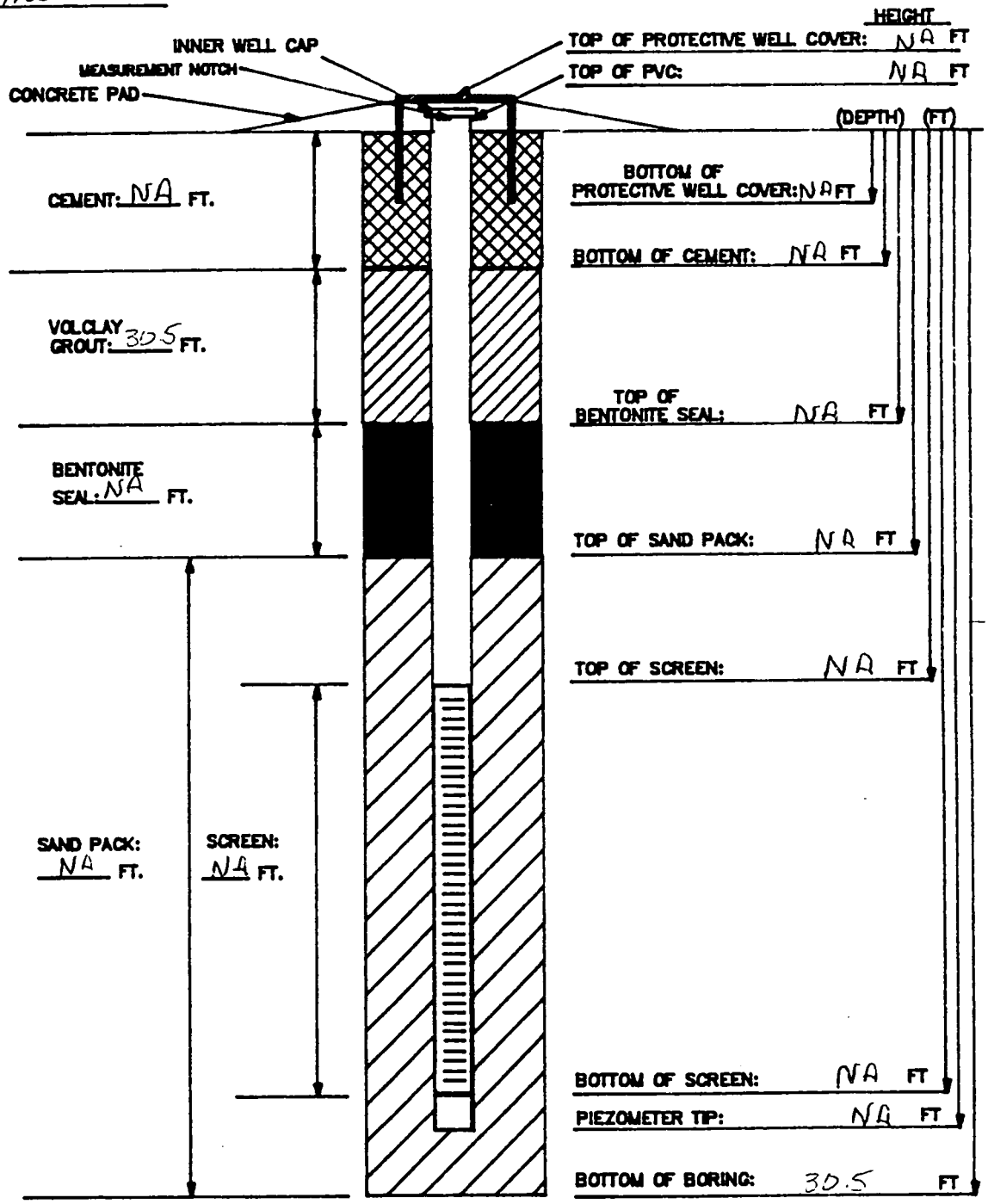
FERNALD RI/FS

INSTALLATION DIAGRAM

~~MONITORING WELL~~ NO. Boring 1723

7-12-91 J.C

INSTALLATION DATE: 7-12-91 2126



	HEIGHT	(DEPTH) (FT)
TOP OF PROTECTIVE WELL COVER:	NA FT	
TOP OF PVC:	NA FT	
BOTTOM OF PROTECTIVE WELL COVER:	NA FT	
BOTTOM OF CEMENT:	NA FT	
TOP OF BENTONITE SEAL:	NA FT	
TOP OF SAND PACK:	NA FT	
TOP OF SCREEN:	NA FT	
BOTTOM OF SCREEN:	NA FT	
PIEZOMETER TIP:	NA FT	
BOTTOM OF BORING:	30.5 FT	

BOREHOLE DIAMETER: 10 INCHES

MATERIALS USED:

SAND TYPE AND QUANITITY: NA
BENTONITE PELLETS (5-GALLON BUCKETS): NA
BAGS OF VOLCLAY GROUT: 4
AMOUNT OF CEMENT: NA
AMOUNT OF WATER USED: 75 gals
OTHER: NA

NOTES: NA

1) RISER 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 SUMP.
4) WATER DEPTH/DATE:
5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
6) PARENTHESIS INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 602.26.91 GEOLOGIST/ENGINEER: J. Lear

RNALD
RI/FS

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME fmpc RI/FS FIELD ENG./GEO. J. Lear DATE 7-12-91
PROJECT NO. 602.26.94 CHECKED BY DATE
BORING NO. 1723
PIEZOMETER NO. NA DATE OF INSTALLATION 7-12-91

BOREHOLE DRILLING

DRILLING METHOD Auger	TYPE OF BIT 10in Hollow Auger
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID NA ~~FROM~~ ~~TO~~	SIZE NA ~~FROM~~ ~~TO~~
FLUID NA FROM ~~TO~~	SIZE NA ~~FROM~~ ~~TO~~

PIEZOMETER DESCRIPTION

TYPE NA	RISER PIPE MATERIAL NA
DIAMETER OF PERFORATED SECTION NA	RISER PIPE DIAMETERS:
PERFORATION TYPE: NA	O.D. NA I.D. NA
SLOTS ☐ HOLES ☐ SCREEN ☐	LENGTH OF PIPE SECTIONS NA
AVERAGE SIZE OF PERFORATIONS NA	JOINING METHOD NA
TOTAL PERFORATED AREA NA	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH NA	OTHER PROTECTION NA
PROTECTIVE PIPE O.D. NA	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE ( )		ELEVATION ( )	
TOP OF RISER PIPE	NA			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	NA			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 30.5	TOP	BOTTOM
BENTONITE	TOP NA	BOTTOM NA	TOP	BOTTOM
SAND	TOP NA	BOTTOM NA	TOP	BOTTOM
GRAVEL	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP NA	BOTTOM NA	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	NA			
GWL AFTER INSTALLATION	NA			

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

REMARKS

ALD
/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-19-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 1 OF

DEPTH DRILLED AT ∅° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	64055 7/19/91 1745		3.0	Dark Yellowish brown (10YR, 4/4) very stiff SILT with some CLAY and a little organic matter, dry, non plastic	ML	4.0	Top Hnu: .4 ppm, βγ: N/A cpm, α: N/A cpm; Bottom Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm
1				Light Yellowish brown (2.5Y, 6/4) hard CLAY with a little dark gray (10YR, 4/1) mottling, trace organic matter, dry, non plastic	CL	>4.5	
3				No Recovery			Top Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm
	Sequence 1						
5	64056 7/19/91 1825		5.0	Light Yellowish brown (2.5Y, 6/4) hard CLAY with a little dark gray (10YR, 4/1) mottling, trace organic matter, dry, non plastic	CL	>4.5	Top Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm
6				Light Yellowish brown (2.5Y, 6/4) very stiff CLAY with a little dark grayish brown (10YR, 4/2) mottling and a little sand and gravel, trace organic matter, damp, non plastic	CL	4.0	Top Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: .6 ppm, βγ: 1000 cpm, α: 0 cpm
9.5	Sequence 2			olive gray (5Y, 5/2) very stiff CLAY, moist, non plastic	CL	3.0	
10	64057 7/19/91 1840		3.5	Olive gray (5Y, 5/2) very stiff CLAY with trace organic matter, moist, non plastic	CL	2.75	Top Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm
13.5				No Recovery			Top Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: 1000 cpm, α: 0 cpm
15	Sequence 3						

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1185	.4 ppm
Non Shielded BETA-GAMMA Probe	771198	1000 cpm
ALPHA	59146	0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)		
BORING NUMBER: 1619	COORDINATES:		DATE 7-19-91
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth	Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers			PAGE 2 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15	64058 7/19/91 2300		3.9	Olive (5Y, 5/4) Very dense Gravel, Sand, and clay mixture, one large steel nail is in the sample, dry	GC	N/A	Top Hnu: .4 ppm, γ: 1000 cpm, α: N/A cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm
18.9	Sequence 4			No Recovery			Top Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm
20	64059 7/19/91 2315		5.0	Olive (5Y, 5/4) very dense gravel, sand, and clay mixture, dry	GC	N/A	Top Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm
21	Sequence 5			Light olive brown (2.5Y, 5/4) very stiff CLAY with a little light brownish gray (2.5Y, 6/2) mottling, damp, low plasticity	CL	4.0	Top Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm
25	64060 7/19/91 2330		5.0	A mottled light yellowish brown (2.5Y, 6/4), light brownish gray (2.5Y, 6/2), and dark grayish brown (2.5Y, 4/2) very stiff CLAY, moist, low plasticity	CL	2.5	Top Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm
27.5	Sequence 6			Light olive brown (2.5Y, 5/4) very stiff CLAY with a little dark grayish brown (2.5Y, 4/2) mottling, moist, medium plasticity	CL	2.5	Top Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, γ: 1000 cpm, α: 0 cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS	
Hnu	1185	.4	ppm
BETA-GAMMA	77119	1000	cpm
ALPHA	59146	0	cpm

ALD
/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-20-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 3 OF

DEPTH DRILLED AT 60° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	64061 7/19/91 2350 Sequence 7		5.0	Light olive brown (2.5Y, 5/4) stiff CLAY, moist, medium plasticity	CL	1.25	Top Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Top Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm
35	64062 7/20/91 0005 Sequence 8		4.0	Light yellowish brown (2.5Y, 6/4) stiff CLAY with Light brownish gray (2.5Y, 6/2) mottling, moist, low plasticity with silt; 39: No Recovery	CL	1.5	Top Hnu: .4 ppm, βγ: /1000 cpm, α: N/A cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Top Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm
40	64063 7/20/91 0025 Sequence 9		5.0	Light yellowish brown (2.5Y, 6/4) stiff CLAY with light brownish gray (2.5Y, 6/4) mottling, trace sand and fine gravel, damp, no plasticity with silt	CL	1.5	Top Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Top Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm; Bottom Hnu: .4 ppm, βγ: /1000 cpm, α: 0 cpm
45							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Jennsen, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1185	.4 ppm
Non Shielded BETA-GAMMA Probe	771195	1000 cpm
ALPHA	59146	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-20-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 4 OF

DEPTH DRILLED AT ° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45	64064 7-20-91 1855		3.8	Yellowish brown (10YR, 5/4) hard Clay with silt and gray (10YR, 7/2) mottling, damp, low plasticity	CL	>4.5	Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm
48.8	Sequence 10			NO Recovery			Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm
50	64065 7-20-91 1915		5.0	Yellowish brown (10YR, 5/4) very stiff Clay with silt, light gray (10YR, 7/2) Mottling, Damp, non plastic.	CL	3.75	Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm
	Sequence 11						Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm
55		64066 64067 64068 64069 7/20/91 1940	5.0	A mottled Yellowish Brown (10YR, 5/6) Yellowish brown (10YR, 5/8), and light gray (10YR, 7/2) stiff Clay with Silt, moist, medium plasticity	CL	1.25	Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm
60	Sequence 12						Top Hnu: .2 ppm βγ: 275 cpm α: 0 cpm Bottom Hnu: .2 ppm βγ: 275 cpm α: 0 cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS	
Hnu	A01336	.2	ppm
BETA-GAMMA	50747	275	cpm
ALPHA	73937	0	cpm

/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-20-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 5 OF

DEPTH / DRILLED AT ∠ ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
60	64071 64072 64073 64074 7/20/91 2325 sequence 13		5.0	A mottled light Yellowish brown (2.5Y, 6/4) to light gray (2.5Y, 7/2) stiff Clay with silt, moist, medium plasticity	CL	1.5	Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm
65	64075 7/22/91 1030 sequence 14		med. 5.0	Light Yellowish Brown (2.5Y, 6/4) dense Clayey very fine Sand, wet medium plasticity.	SC	N/A	Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm
70	64076 7/22/91 0150 sequence 15			Light Yellowish Brown (2.5Y, 6/4) med. dense Clayey very fine Sand and a little light gray (5Y, 7/1) mottling, wet, medium plasticity			Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Top: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 275 cpm, α: 0 cpm
75							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01336	.2 ppm
BETA-GAMMA	50747	275 cpm
ALPHA	73937	0 cpm

FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-23-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 6 OF

DEPTH DRILLED AT 8° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
75	64077 7/23/91 1730		5.0	Light Yellowish Brown (2.5Y, 6/4) Med. dense clayey very fine Sand, wet, low plasticity	SC	N/A	Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm
	Sequence 16						
80	64078 64079 64080 7/23/91 2315		5.0	Light Yellowish Brown (2.5Y, 6/4) medium dense Clayey Sand, Saturated	SC	N/A	Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm
	Sequence 17						
85	64081 7/23/91 2350		5.0	Olive (5Y, 5/4) dense Sand with a little Clay and gravel, Saturated	SC	NA	Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Top Hnu: .2 ppm βγ: 300 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 300 cpm α: 0 cpm
90	Sequence 18						

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	300 cpm
ALPHA	73918	0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-24-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 7 OF

DEPTH DRILLED AT 8° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
90	64082 7/24/91 0100 Sequence 19		0				Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm
95	64083 7/24/91 2350		5.0	Olive (5Y, 5/4) dense Sand Saturated	SC	N/A	Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm
97.5				olive-(5Y, 5/4) dense gravel, Sand, and Clay mixture, Saturated	GC	N/A	Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm
99.5	Sequence 20			Olive gray (5Y, 5/2) dense gravel sand and Clay mixture, Saturated	GC	N/A	
100	64084 64085 64086 7/25/91 0130		5.0	Olive gray (5Y, 5/3) Very loose Clayey Sand with a little gravel, Saturated Note: →	SC	N/A	Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; : loose Sand dripped out of the Sample tube when the spoon was Broke open — Top Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, γ: 350 cpm, α: 0 cpm
103.75	Sequence 21			olive gray (5Y, 5/3) loose Clayey Sand with gravel, Saturated	SC	N/A	
105							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	350 cpm
ALPHA	73918	0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1619	COORDINATES:	DATE 7-25-91
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-19-91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 8 OF

DEPTH DRILLED AT 8° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
105	64087 7-25-91 0200 sequence 22		5.0	olive gray (5Y, 5/2) very stiff gravely clay with sand, wet med. plasticity	CL	2.75	Top Hnu: .2 ppm βγ: 350 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 350 cpm α: 0 cpm; Top Hnu: .2 ppm βγ: 350 cpm α: 0 cpm; Bottom Hnu: .2 ppm βγ: 350 cpm α: 0 cpm
110							Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm; Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm; Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm; Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	350 cpm
ALPHA	73918	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/6	COORDINATES: N480469.40 E1378315.30	DATE 6-8-91
ELEVATION: 571.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6-8-91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 1 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0	64011 6/8/91 1600			Hard olive brown (2.5Y, 4/4) SANDY CLAY with some root fragments, dry	CL	>4.5	Top Hnu: 0 ppm, βγ: 400 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 400 cpm, α: 0 cpm
2.5			4.17	Hard olive brown (2.5Y, 4/4) SANDY CLAY with trace coarse gravel, dry	CL	>4.5	Top Hnu: 0 ppm, βγ: 400 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 400 cpm, α: 0 cpm
4.17	Sequence 1			No Recovery			
5	64012 6/8/91 1700		0	No Recovery			Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm; Note: Gravel Jammed in cutting shoe
	Sequence 2						
8	64013 6/11/91 1730		4.4	Dark Yellowish brown (10YR, 4/4) very stiff SANDY CLAY with gravel, trace organic matter, damp, low plasticity	CL	2.5 to 3.5	Top Hnu: .2 ppm, βγ: 200 cpm, α: N/A cpm; Bottom Hnu: .2 ppm, βγ: 200 cpm, α: 0 cpm; Top Hnu: .2 ppm, βγ: 200 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 200 cpm, α: 0 cpm
12.4	Sequence 3			No Recovery			
13				continued on following page			Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Bob Johnson
Assistants: Mark Rehold, Brian Meuller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104 6/11	0 .2 ppm
BETA-GAMMA	73937 6/11	400 200 cpm
ALPHA	7390E	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/6	COORDINATES: N480469.40 E1378315.30	DATE 6/12/91
ELEVATION: 571.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G.M. and K.M	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 2 OF 9

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
13	64014 6/12/91 1723		0	No Recovery			Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm; Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
	Sequence 4						
18	64015 6/14/91 0925		4.4	Dark Yellowish brown (10YR, 4/4) stiff SANDY CLAY with gravel, damp, medium plasticity	CL	1.25	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
19.7				Light olive brown (2.5Y, 5/4) medium dense CLAYEY SAND with a little gravel, moist	SC	N/A	
20.9				Light olive brown (2.5Y, 5/4) very stiff CLAYEY SILT with pale yellow (2.5Y, 7/3) mottling	ML	2.0	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
22.4	Sequence No. 5			No Recovery			
23	64016 6/14/91 1730		5.0	Pale Yellow (5Y, 7/3) to olive (5Y, 5/4) mottled very stiff CLAYEY SILT with trace gravel, damp, non plastic	ML	2.0	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
26				Pale Yellow (5Y, 7/3) to olive (5Y, 5/4) mottled very stiff CLAYEY SILT with trace gravel, moist, non plastic	ML	2.0	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
28	Sequence 6						

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Brian Meuller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104 6/14:	.1 .2 ppm
BETA-GAMMA	73937 6/14:	150 280 cpm
ALPHA	67583	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N 480469.40 E 1378315.30	DATE 6/15/91
ELEVATION: 571.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 3 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
18	64017 6/15/91 1630		5.0	Pale Yellow (2.5Y, 7/3) to light Yellowish brown (2.5Y, 6/4) mottled Very stiff CLAYEY SILT, damp, non plastic	ML	2.5	Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm
31.3	sequence 7			Dark Yellowish brown (10YR, 4/4) soft SANDY CLAY, moist, low plasticity	CL	.5	Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm
33	64018 6/15/91 1220		5.0	Dark Yellowish brown (10YR, 4/4) medium dense CLAYEY SAND, moist	SC	N/A	Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm
38	sequence 8						
	64019 6/15/91 1355		4.6	Dark Yellowish brown (10YR, 4/4) medium dense CLAYEY SAND with a little light gray (5Y, 7/1) mottling, moist	SC	N/A	Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Top Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 260 cpm, α: 0 cpm
2.6 43	sequence 9			No Recovery			

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Brian Mueller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104	.1 ppm
BETA-GAMMA	73937	260 cpm
ALPHA	55361	0 cpm

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N480469.40 E1378315.30	DATE 6/19/91
ELEVATION: 571.3 ft. above Sea Level	GWL: Depth Date/Time	DATE STARTED: 6/18/91
ENGINEER/GEOLOGIST: G.M. & K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 4 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (BPF)	REMARKS
48	64020 6/19/91 1710 sequence 10		5.0	Dark Yellowish Brown (10YR, 4/4) Medium dense sand with a little to trace clay, saturated.	SC	NA	Top Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Top Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm
53	64023 6/21/91 1640 sequence 11		1.7	Yellowish Brown (10YR, 5/4) Loose sand with a little gravel and trace fossils, saturated	SC	NA	Top Hnu: .1 ppm, γ: 250 cpm, α: NA cpm; Bottom Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Note: Sample No's 64021 & 64022 were assigned to water samples; Top Hnu: ppm, γ: cpm, α: cpm; Bottom Hnu: ppm, γ: cpm, α: cpm
58	64024 6/22/91 0915 sequence 12		3.8	Light olive Brown (2.5Y, 5/4) Medium dense sand with a little gravel, saturated.	SC	N/A	Top Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Top Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, γ: 250 cpm, α: 0 cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Brian Mueller
6/21 & 6/22: Mark Rebold, Brian Mueller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104	.1 ppm
BETA-GAMMA	73937	250 cpm
ALPHA	55361	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/6	COORDINATES: N480469.40 E1378315.30	DATE 6/22/91
ELEVATION: 571.3 ft above sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 5 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
58	64025 6/22/91 1130		4 ft.	Brown (10YR, 5/3) medium dense SAND with a little fine gravel and CLAY, saturated	SC	N/A	Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm
61.7 62	sequence 13			~~olive gray (5Y, 5/2) stiff CLAY, wet, low plasticity~~ No Recovery	CL	1.25	Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm
63 64.5	64026 6/24/91 1000		5.0	Light olive brown (2.5Y, 5/4) loose SAND, saturated	SC	N/A	Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm
	sequence 14			Interbedded layers of gray (5Y, 5/1) stiff CLAY with trace gravel, moist, low plasticity and Light olive brown (2.5Y, 5/4) loose SAND	SC / CL	N/A / 1.5	Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm
68	64027 6/24/91 1415		5.0	Gray (5Y, 5/1) dense gravel, sand and clay mixture, wet	GC	N/A	Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm
	sequence 15						Top Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, pγ: 250 cpm, α: 0 cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Mark Rebeid, Brian Meuller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104	.1 ppm
BETA-GAMMA	73937	250 cpm
ALPHA	55361	0 cpm

FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N430469.40 E1378315.30	DATE 6/25/91
ELEVATION: 571.3 ft. above Sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G.M. + K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 6 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
73	64028 6/25/91 1425		5.0	Gray (5Y 5/1) dense Gravel, Sand and clay mixture, wet	GC	N/A	Top Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm
74				Gray (5Y, 5/1) stiff Clay with trace Gravel and sand moist, low plasticity	CL	2.0	Top Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm
77	sequence 16			Gray (5Y, 5/1) Stiff Sandy Clay with a little gravel, damp No plasticity	CL	2.0	
78	64029 6/25/91 1650		5.0	Same as above but Moist + Low plasticity	CL	2.0	Top Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm
	sequence 17			Gray (5Y, 5/1) Medium Stiff Clay with sand and gravel, moist, Low plasticity	CL	.75	Top Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm
83	64030 64031 6/26/91 0835			Gray (5Y, 5/1) Medium Stiff Clay with trace sand + gravel damp, med plasticity			Top Hnu: 0 ppm, γ: 280 cpm, α: NA cpm; Bottom Hnu: 0 ppm, γ: 280 cpm, α: 0 cpm
85.2	sequence 18			No Recovery			Top Hnu: ppm, γ: cpm, α: cpm; Bottom Hnu: ppm, γ: cpm, α: cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Mark Rebold, Jim Capannari

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS	
Hnu	1104	0	ppm
BETA-GAMMA	73937	280	cpm
ALPHA	55361	0	cpm

FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N480469.40 E1378315.30	DATE 6/26/91
ELEVATION: 576.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6-8-91
ENGINEER/GEOLOGIST: K.M. and G.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 7 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	64032 64033 64034 64035 64036 6/26/91 1600 Sequence 19		5.0	Gray (5Y, 5/1) medium stiff CLAY with a little SAND and gravel, moist, high plasticity	CL	1.0	Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm
93	64037 6/27/91 0920 Sequence 20		5.0	Gray (5Y, 5/1) medium stiff CLAY with a little SAND and gravel, moist, high plasticity	CL	1.0	Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm
98	64038 6/27/91 1700 Sequence 21		5.0	Gray (5Y, 5/1) stiff CLAY with a little SAND and trace gravel, moist, high plasticity	CL	1.25	Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Top Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 300 cpm, α: 0 cpm
103							

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Ben Johnson, Brian Mueller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1104	.1 ppm
BETA-GAMMA	73937	300 cpm
ALPHA	55361	0 cpm

402-11-44

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N480469.40 E1378315.30	DATE: 6/28/91
ELEVATION: 576.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G. M. and K. M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 8 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
103	64039 64040 64041 64042 64043 64044 64045 6/28/91 1000 Sequence 22		5.0	Gray (5Y, 5/1) stiff CLAY with a little SAND and trace gravel, moist, high plasticity	CL	1.25	Top Hnu: .6 ppm, γ: /1000 cpm, α: 0 cpm Bottom Hnu: .6 ppm, γ: /1000 cpm, α: 0 cpm Top Hnu: .6 ppm, γ: /1000 cpm, α: 0 cpm Bottom Hnu: .6 ppm, γ: /1000 cpm, α: 0 cpm
108	64049 6/28/91 1100		5.0	Gray (5Y, 5/1) stiff CLAY with SAND and Gravel, moist, high plasticity	CL	1.5	Top Hnu: .3 ppm, γ: /1000 cpm, α: 0 cpm Bottom Hnu: .3 ppm, γ: /1000 cpm, α: 0 cpm Top Hnu: .3 ppm, γ: /1000 cpm, α: 0 cpm Bottom Hnu: .3 ppm, γ: /1000 cpm, α: 0 cpm
112.5 113	Sequence 23			Gray (5Y, 5/1) limestone	N/A	N/A	The bottom half tennite tube split down the middle
				The augers were used to drill this five foot interval through the limestone sheet without the split barrel sampler			Top Hnu: ppm, γ: cpm, α: cpm Bottom Hnu: ppm, γ: cpm, α: cpm Top Hnu: ppm, γ: cpm, α: cpm Bottom Hnu: ppm, γ: cpm, α: cpm
118							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Jim Capanari

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	111037	.3 ppm
Nan Shielded BETA-GAMMA Probe	77173	1000 cpm
ALPHA	6001	0 cpm

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1616	COORDINATES: N480469.40 E1378315.30	DATE 7/1/91
ELEVATION: 571.3 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 6/8/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED: 7/15/91
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 9 OF 9

DEPTH DRILLED AT 7° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
118	6405c 7/1/91 2000 sequence 24		1.6	Olive gray (5Y, 5/2) hard CLAY with SAND and Gravel, dry, nonplastic	CL	>4.0	Top Hnu: .3 ppm, βγ: 800 cpm, α: N/A cpm; Bottom Hnu: .3 ppm, βγ: 800 cpm, α: 0 cpm
119.6	6405j 7/2/91 0155		.5	Olive gray (5Y, 5/2) hard CLAY with SAND and Gravel, dry, nonplastic	CL	>4.0	Note: Water entered the sample from a layer above
120.1	↑ sequence 25						Top Hnu: .3 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 800 cpm, α: 0 cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Mark Rebold/Brian Meuller

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	1185	.3 ppm
BETA-GAMMA	Non Shielded 50754 probe	800 cpm
ALPHA	50747	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1618	COORDINATES: N480236.57 E1378645.83	DATE 7/27/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 1 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
.5	64092 7/27/91 1835		.5	organic matter such as grass and root stems with a little yellowish brown (10YR, 5/6) CLAY, dry, non plastic, a few gray insects			Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
3.2	sequence 1		5.0	Yellowish brown (10YR, 5/6) stiff CLAY with trace organic matter, dry, non plastic	CL	2.5	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
5	54093 7/27/91 1900		4.0	Yellowish brown (10YR, 5/6) hard CLAY with trace root stems and gravel, damp, non plastic	CL	>4.5	Top Hnu: .3 ppm, γ: 250 cpm, α: N/A cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
9	sequence 2			No Recovery		4.5	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
10	64094 7/27/91 1910			Yellowish brown (10YR, 5/6) very stiff CLAY with trace gray (10YR, 6/1) mottling, damp, low plasticity	CL	3.5	Top Hnu: .3 ppm, γ: 250 cpm, α: N/A cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
11.7				A mottled dark brown (10YR, 3/3) and reddish brown (5YR, 4/4) medium stiff CLAY with a little silt and organic matter, damp, low plasticity	CL	1.0	
12.7			4.6	Yellowish brown (10YR, 5/6) very stiff CLAY with trace gray (10YR, 6/1) mottling, damp, low plasticity	CL	3.5	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
13.5				A mottled dark brown (10YR, 3/3) and reddish brown (5YR, 4/4) very stiff CLAY with a little silt and trace organic matter, damp, low plasticity	CL	3.5	
14.6	sequence 3			No Recovery			
15							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.3 ppm
BETA-GAMMA	73937	250 cpm
ALPHA	73918	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/8	COORDINATES: N480236.57 E378645.83	DATE 7/27/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 2 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15	64095 7/27/91 1930			Dark brown (10YR, 4/3) very stiff SILTY CLAY with a little reddish brown (5YR, 4/4) mottling and trace organic matter, damp, non plastic	CL	3.0	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
16				Light olive brown (2.5Y, 5/4) very stiff SANDY CLAY with fine gravel and a little reddish brown (5YR, 4/4) mottling, dry, non plastic	CL	3.5	
			3.0				Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
18	Sequence 4			No Recovery			
20	64096 7/27/91 2320			Light olive brown (2.5Y, 5/4) hard SANDY CLAY with gravel, trace root stems, dry, non plastic	CL	>4.5	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
			3.1				Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
23.1	Sequence 5			No Recovery			
25	64097 7/27/91 2330			Light olive brown (2.5Y, 5/4) hard CLAY with sand and fine gravel, dry, non plastic	CL	>4.5	Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
26				A mottled Light olive brown (2.5Y, 5/4) and grayish brown (2.5Y, 5/4) hard CLAY with trace Very dark gray (2.5Y, 3/0) organic matter			
			3.4				Top Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, γ: 250 cpm, α: 0 cpm
28.4	Sequence 6			No Recovery			
30							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.3 ppm
BETA-GAMMA	73937	250 cpm
ALPHA	73918	0 cpm

FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1618	COORDINATES: N480236.57 E1578645.83	DATE 7/27/91
ELEVATION: 577.39 ft. above Sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 3 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30	64098 7/27/91 2345		5.0	A mottled light olive brown (2.5Y, 5/4) and light brownish gray (2.5Y, 6/2) hard CLAY, damp, non plastic	CL	>4.5	Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm
	Sequence 7						
35	64099 7/28/91 0000		5.0	Light olive brown (2.5Y, 5/4) very stiff CLAY with grayish brown (2.5Y, 5/2) mottling, damp, low plasticity	CL	2.5	Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm
37.5				Light olive brown (2.5Y, 5/4) stiff CLAY with grayish brown (2.5Y, 5/2) mottling, damp, medium plasticity	CL	1.5	Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm
	Sequence 8						
40	64100 7/29/91 1845			Grayish brown (2.5Y, 5/2) stiff CLAY with yellowish brown (10YR, 5/6) mottling, damp, low plasticity	CL	1.25	Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm
42.4			3.4	Light olive brown (2.5Y, 5/4) very stiff CLAY with some gray (5Y, 6/1) and a little very dark grayish brown (10YR, 3/2) mottling, damp, medium plasticity	CL	3.0	Top Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm; Bottom Hnu: .3 ppm, βγ: 250 cpm, α: 0 cpm
43.4							
	Sequence 9			No Recovery			
45							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.3 ppm
BETA-GAMMA	73937	250 cpm
ALPHA	73918	0 cpm

A/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1618	COORDINATES: N48236.57 E1378645.83	DATE 7/30/91
ELEVATION: 577.39 ft above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 4 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45	64101 64102 64103 7/29/91 1915			Light olive brown (2.5Y, 5/4) stiff CLAY with some gray (5Y, 6/1) and a little very dark grayish brown (10YR, 3/2) mottling, damp, medium plasticity	CL	2.0	Top Hnu: .2 ppm, βγ: 280 cpm, α: N/A cpm Bottom Hnu: .6 ppm, βγ: 280 cpm, α: 0 cpm
47			3.5	Light olive brown (2.5Y, 5/4) very stiff CLAY with some gray (5Y, 6/1) and a little very dark grayish brown (10YR, 3/2) mottling, damp, medium plasticity	CL	3.5	Top Hnu: .6 ppm, βγ: 280 cpm, α: 0 cpm Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
48.5	Sequence 10			No Recovery			
50	64104 64105 64106 64107 64108 7/30/91 0030		3.75	Light olive brown (2.5Y, 5/4) stiff CLAY with some gray (5Y, 6/1) and a little very dark grayish brown (10YR, 3/2) mottling, damp, medium plasticity	CL	2.5	Top Hnu: .2 ppm, βγ: 280 cpm, α: N/A cpm Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
53.75	Sequence 11			No Recovery			
55	64109 7/30/91 0121			Light olive brown (2.5Y, 5/4) stiff CLAY, damp, medium plasticity	CL	2.5	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
57			5.0	Light olive brown (2.5Y, 5/4) stiff CLAY with a little sand and gravel, and light gray (2.5Y, 7/2) mottling, damp, medium plasticity	CL	1.75	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
60	Sequence 12						

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Larry Marshall, Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	280 cpm
ALPHA	73918	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/8	COORDINATES: N4902365.7 E1378645.83	DATE 7/30/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 5 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
60							
60.25	64110 7/30/91 0140		60.25	Light olive brown (2.5Y, 5/4) stiff CLAY with a little sand and gravel, and light gray (2.5Y, 7/2) mottling, damp, medium plasticity	CL	1.75	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
	Sequence 13		5.0	Light olive brown (2.5Y, 5/4) stiff CLAY, damp, medium plasticity	CL	1.75	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
65	64111 64112 64113 64114 7/30/91 2359		5.0	Light olive brown (2.5Y, 5/4) stiff CLAY with a little light gray (2.5Y, 7/2) mottling, damp, medium plasticity	CL	1.75	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
	Sequence 14						Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
70	64115 64116 64117 64118 64119 7/31/91 0040		5.0	Light yellowish brown (2.5Y, 6/4) stiff silty clay with a little sand and light olive gray (5Y, 6/2) mottling, damp, low plasticity	CL	1.5	Top Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 280 cpm, α: 0 cpm
	Sequence 15						
75							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	280 cpm
ALPHA	73919	0 cpm

RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/8	COORDINATES: N480236.57 E1378645.83	DATE 7/31/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 6 OF

DEPTH DRILLED AT ANGLE 75	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	64120 7/31/91 0200			Light yellowish brown (2.5Y, 6/4) stiff Clayey Silt, damp, non plastic			Top Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
	Sequence 16		5.0		ML	2.0	Top Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
80	64121 7/31/91 2355			Light yellowish brown (2.5Y, 6/4) stiff CLAYEY-SILT with a little light gray (2.5Y, 7/0) mottling, damp, non plastic			Top Hnu: .4 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
	Sequence 17		5.0		ML	1.5	Top Hnu: .2 ppm, βγ: cpm, α: cpm; Bottom Hnu: .2 ppm, βγ: cpm, α: cpm
85	64122 64123 64124 8/1/91 0010			Light yellowish brown (2.5Y, 6/4) Stiff CLAYEY SILT with a little light gray (2.5Y, 7/0) mottling, damp low plasticity	ML	1.5	Top Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
87.5			5.0	Light yellowish brown (2.5Y, 6/4) stiff SILTY CLAY with a little light gray (2.5Y, 7/0) mottling, damp, low plasticity	CL	1.5	Top Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm; Bottom Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
90	Sequence 18						

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Larry Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	300 cpm
ALPHA	73918	0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/8	COORDINATES: N480236.57 E1378645.83	DATE 8/1/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 7 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
90	64125 64126 64127 64128		5.0	Light yellowish brown (2.5Y, 6/4) stiff CLAYEY SILT with a little light gray (2.5Y, 7/0) mottling, damp, low plasticity	ML	1.5	Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
	8/1/91 0107 Sequence 19						Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
95	64132 8/1/91 1945		5.0	Light yellowish brown (2.5Y, 6/4) stiff SILTY CLAY with fine sand and a little light gray (2.5Y, 7/0) and light gray (2.5Y, 7/2) mottling, damp, low plasticity	CL	1.5	Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 300 cpm, α: cpm
	Sequence 20						Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .4 ppm, βγ: 300 cpm, α: 0 cpm
100	64133 8/1/91 2340		5.0	Light yellowish brown (2.5Y, 6/4) stiff CLAYEY SILT with a little light gray (2.5Y, 7/0) and light gray (2.5Y, 7/2) mottling, damp, low plasticity	ML	1.5	Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
103.5	Sequence 21			Light olive brown (2.5Y, 5/4) very stiff CLAY, damp, medium plasticity	CL	2.5	Top: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm Bottom: Hnu: .2 ppm, βγ: 300 cpm, α: 0 cpm
105							

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Glen Marshall

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	.2 ppm
BETA-GAMMA	73937	300 cpm
ALPHA	73918	0 cpm

/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1618	COORDINATES: N480236.57 E378645.83	DATE 8/2/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: K.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 8 OF

DEPTH DRILLED AT 5° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
105	64134 64135 64136 64137 64138 ~~64139~~ ~~64140~~ 64141 8/2/91 0015 Sequence 22		5.0	Light olive brown (2.5Y 5/4) stiff CLAY, moist, medium plasticity	CL	2.0	Top Hnu: 0 ppm, βγ: 360 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm Note: The βγ is 100 cpm above background at 105 ft
108				Olive (5Y, 5/4) Very stiff clay, moist, high, plasticity	CL	2.5	Top Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm
110	8/3/91 64142 ~~1115~~ 0200 Sequence 23		5.0	Olive (5Y, 5/3) to olive gray (5Y, 5/2) stiff CLAY, damp, high plasticity	CL	1.0	Top Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm Top Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm
115	64143 8/3/91 1622 Sequence 24		5.0	Olive (5Y, 5/3) stiff CLAY with trace black weathering, damp, high plasticity	CL	1.25	Top Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm Top Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm; Bottom Hnu: 0 ppm, βγ: 260 cpm, α: 0 cpm
120							

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Larry Marshall, Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A61345	0 ppm
BETA-GAMMA	73937	260 cpm
ALPHA	73918	0 cpm

402-11-44

/I/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 16/8	COORDINATES: N480236.57 E371845.83	DATE 8/3/91
ELEVATION: 577.39 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 7/27/91
ENGINEER/GEOLOGIST: L.M., G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 9 OF 0

DEPTH DRILLED AT 5° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
120	64144 8/3/91 1700 Sequence 25		5.0	olive (5Y, 5/3) stiff silty clay with trace black weathering, damp, high plasticity	CL	1.0	Top Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Bottom Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Top Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Bottom Hnu: 0 ppm βγ: 280 cpm α: 0 cpm
125	64145 64146 64147 64148 64149 64150 8/3/91 1820 Sequence 26		5.0	A mottled pale olive (5Y, 6/4) and olive gray (5Y, 5/2) medium stiff silty CLAY with a little fine sand, trace black weathering, damp, medium plasticity	CL	.5	Top Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Bottom Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Top Hnu: 0 ppm βγ: 280 cpm α: 0 cpm; Bottom Hnu: 0 ppm βγ: 280 cpm α: 0 cpm
				A mottled pale olive (5Y, 6/4) and olive gray (5Y, 5/2) medium stiff SILTY CLAY with a little fine sand, moist, medium plasticity			
130							Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm; Top Hnu: ppm βγ: cpm α: cpm; Bottom Hnu: ppm βγ: cpm α: cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Larry Marshall, Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01345	0 ppm
BETA-GAMMA	73937	280 cpm
ALPHA	73918	0 cpm

ANALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1617	COORDINATES: N 480309.27 E 1378393.47	DATE 5/2/91
ELEVATION: 576 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/30/91
ENGINEER/GEOLOGIST: G.M and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 1 OF

DEPTH DRILLED AT 6° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.5	66976 5/2/91 0920 Sequence No. 1		1.5 *	Brown (10YR, 4/3) soft CLAY, with some root fragments, leaves, root stems, and wild onions, damp, medium plasticity	CL	.5	Top Hnu: 2.0 ppm, γ: N/A cpm, α: N/A cpm; Bottom Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm
4.9	66977 5/2/91 1025 Sequence No. 2		3.4	Light olive brown (2.5Y, 5/4) very stiff CLAY with a little sand, trace root fragments, and fine gravel, damp, low plasticity	CL	3.0	Top Hnu: 2.0 ppm, γ: N/A cpm, α: N/A cpm; Bottom Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm
				No Recovery			Top Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm; Bottom Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm
6.5	66978 5/2/91 1105 Sequence No. 3		3.1	Light olive brown (2.5Y, 5/4) very stiff CLAY with some sand and trace fine gravel, trace strong brown (7.5YR, 5/8) weathered staining, damp, low plasticity	CL	2.5	Top Hnu: 2.0 ppm, γ: N/A cpm, α: N/A cpm; Bottom Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm
7.3				olive brown (2.5Y, 4/3) stiff CLAY, low plasticity, moist	CL	1.5	
9.6				No Recovery			Top Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm; Bottom Hnu: 2.0 ppm, γ: 700 cpm, α: 0 cpm
11.5				Continued on next page			

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

* A total of 3.2 ft. of soil was collected. The additional 1.7 ft. of soil comes from where the sampler skidded across the ground surface a foot at the start of the bore hole.

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083	2.0 ppm
BETA-GAMMA	77194	700 cpm
ALPHA	50740	0 cpm

402-11-46

RNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1617	COORDINATES: N 480309.27 E 1378393.47	DATE 5/2/91
ELEVATION: 576 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/30/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 2 OF

DEPTH DRILLED AT 6° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	66979 5/2/91 1439 sequence NO. 4		3.2	Dark yellowish brown (10YR, 4/4) stiff CLAY, moist, medium plasticity	CL	2.0	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
14.7				No Recovery			Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm. Depth is stopped here and is equal to 16.5 ft.
16.5	66980 66981 66982 66983 66984 5/2/91 1535 sequence NO. 5		3.7	Yellowish brown (10YR, 5/4) stiff CLAY, damp, medium plasticity	CL	2.0	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
20.2				No Recovery			Top Hnu: 1.0 ppm, βγ: cpm, α: cpm; Bottom Hnu: 1.0 ppm, βγ: cpm, α: cpm
21.5	66985 66986 5/2/91 1715 sequence NO. 6		3.5	Yellowish brown (10YR, 5/4) stiff CLAY, damp, medium plasticity	CL	2.0	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
24.0				Yellowish brown (10YR, 5/4) very stiff CLAY, damp, medium plasticity	CL	3.25	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
25.0				No Recovery			

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083	1.0 ppm
BETA-GAMMA	77194	800 cpm
ALPHA	50740	cpm

402-11-46

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1617	COORDINATES: N480309.27 E1378393.47	DATE 5/2/91
ELEVATION: 576 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/30/91
ENGINEER/GEOLOGIST: G.M. and K.M	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 3 OF

DEPTH DRILLED AT 6° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	66987 5/2/91 1752		4.9	Dark Yellowish brown (10YR, 4/4) very stiff CLAY, damp, low plasticity	CL	2.0	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
29.5	Sequence NO. 7			Light Yellowish brown (2.5Y, 6/4) ~~very~~ ~~stiff~~ medium dense CLAYEY FINE SAND with light gray (10YR, 7/2) mottling, damp, non plastic	SC	N/A	Top Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm Bottom Hnu: 1.0 ppm, βγ: 800 cpm, α: 0 cpm
31.4 31.5				No Recovery			
32.9	66988 5/3/91 1600		4.1	Light olive brown (2.5Y, 5/4) loose CLAYEY SAND with light gray (2.5Y, 7/2) mottling, moist	SC	N/A	Top Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm Bottom Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm
	Sequence No. 8			Light olive brown (2.5Y, 5/4) soft sandy, silty, CLAY; moist, high plasticity	CL	.25	Top Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm Bottom Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm
36.5	66989 66990 66991 66992 66993 5/3/91		3.7	Light Yellowish brown (2.5Y, 6/4) loose CLAYEY SAND and CLAY with light gray (2.5Y, 7/1) mottling	SC	N/A	Top Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm Bottom Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm
39.3 40.2	1702 Sequence NO. 9			Yellowish brown (10YR, 5/8) to light olive brown (2.5Y, 5/6) medium stiff SANDY CLAY with weathered black organics, moist, medium plasticity	CL ↙	1.0 ↙	Top Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm Bottom Hnu: 1.2 ppm, βγ: 700 cpm, α: 0 cpm
				No Recovery	~~CL~~	~~1.0~~	

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083 5/3:	1.0 1.2 ppm
BETA-GAMMA	77194 5/3: 73937	800 700 cpm
ALPHA	50740	0 cpm

ANALD
RI/FS

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1617	COORDINATES: N 480309.27 E 1378393.47	DATE 5/4/91
ELEVATION: 576 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/30/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 4 OF

DEPTH DRILLED AT 6° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	66994 66995 5/4/91 0900 Sequence NO. 10		4.7	Light olive brown (2.5Y, 5/4) loose CLAYEY SAND with trace weathered black organics, wet	SC	N/A	Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm
46.2 46.5				No Recovery			
	66996 5/4/91 0952 Sequence NO. 11		4.0	Light olive brown (2.5Y, 5/4) loose CLAYEY SAND, Saturated	SC	N/A	Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm
50.5 51.5				No Recovery			
	66997 5/4/91 1030 Sequence NO. 12		5.0	Light Yellowish brown (2.5Y, 6/4) very loose CLAYEY SAND, Saturated	SC	~~very loose~~ N/A	Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm Top: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm, pH=7 Bottom: Hnu: 2.0 ppm, βγ: 600 cpm, α: 0 cpm
				Yellowish brown (10YR, 5/6) loose CLAYEY SAND with trace gravel, wet	SC	N/A	

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083	2.0 ppm
BETA-GAMMA	73937	600 cpm
ALPHA	50740	0 cpm

402-11-44

ANALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1617	COORDINATES: N480309.27 E1378393.47	DATE 5/4/91
ELEVATION: 576 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/30/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 5 OF

DEPTH DRILLED AT ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
58.5	66998 66999 67000 67001 67002 67003 5/4/91 1423 Sequence No. 13		3.7	Light olive brown (2.5 Y, 5/6) loose CLAYEY SAND with some gravel and limestone cobbles, moist to damp	SC	~~loose~~ N/A	Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm The hole was strapped at 63.5 ft. corrected starting depth from 56.5 to 58.5 ft. Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
62.2				No Recovery			
63.5	67004 5/4/91 1620		4.9	Light olive brown (2.5Y, 5/4) CLAY, loose SAND, and GRAVEL mixture, trace limestone cobbles, saturated	GC	~~loose~~ N/A	Top Hnu: 1.3 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.3 ppm, βγ: 800 cpm, α: 0 cpm
65.8	Sequence No. 14			Light brownish gray (2.5 Y, 6/2) medium dense CLAYEY SAND with some gravel,	SC	~~loose~~ ~~medium dense~~ N/A	Top Hnu: 1.3 ppm, βγ: 800 cpm, α: 0 cpm; Bottom Hnu: 1.3 ppm, βγ: 800 cpm, α: 0 cpm
68.4 68.5				No Recovery			
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083	1.3 ppm
BETA-GAMMA	73937	800 cpm
ALPHA	50740	0 cpm

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1615	COORDINATES: N 480617.01 E 1378404.87	DATE 4/7/91
ELEVATION: 578 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/7/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 1 OF

DEPTH DRILLED AT °ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1.5	66953 4/7/91 1450 Sequence No. 1		2.4	Dark grayish brown (10YR, 4/2) stiff CLAYEY SILT with some sand and fine gravel, a few grass and root fragments, Damp, low plasticity	ML	2.0	Top Hnu: 10 ppm, βγ: 900 cpm, α: N/A cpm; Bottom Hnu: 0.2 ppm, βγ: 900 cpm, α: 0 cpm
2.4				Dark grayish brown (10YR, 4/2) stiff CLAYEY SILT with some sand and fine gravel, Damp, low plasticity	ML	2.0	
3.0				No Recovery			
4.8	66954 4/7/91 1530 Sequence No. 2		1.8	Brown (10YR, 4/3) stiff CLAY with a little silt, sand, and root fragments, trace cobbles, moist and medium plasticity	CL	1.0	Top Hnu: 0.4 ppm, βγ: N/A cpm, α: N/A cpm; Bottom Hnu: 0.2 ppm, βγ: 900 cpm, α: 0 cpm. A cobble was lodged in the shoe of the spoon
8.2				No Recovery			
				Continued on next page			

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Bob Ford, Vern Larger

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01344	0.2 ppm
BETA-GAMMA	73937	900 cpm
ALPHA	67626	0 cpm

402-11-46

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1615	COORDINATES: N 480617.01 E 1378404.87	DATE 4/10/91
ELEVATION: 578 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/7/91
ENGINEER/GEOLOGIST: K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 2 OF

DEPTH DRILLED AT ° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
9.9	66955 4/10/91 1054 Sequence No. 3		4.4	Olive brown (2.5 Y, 4/3) medium stiff SILTY CLAY with a few root fragments, and trace subrounded gravel and sand, saturated, medium plasticity	CL	.75	Top Hnu: 3.0 ppm, βγ: N/A cpm, α: N/A cpm; Bottom Hnu: 3.0 ppm, βγ: 1000 cpm, α: 0 cpm. sample was saturated due to rain water entering bore hole pH of water is 7
12.6				Dark olive brown (2.5 Y, 3/3) very stiff SILTY CLAY with trace root fragments, weathered wood fragments, sand and fine gravel, moist, medium plasticity	CL	2.5	Top Hnu: 3.0 ppm, βγ: 1000 cpm, α: 0 cpm; Bottom Hnu: 3.0 ppm, βγ: 1000 cpm, α: 0 cpm
13.2				No Recovery			
17.5	66956 4/10/91 1415 Sequence No. 4		4.3 Full Recovery	Olive brown (2.5Y, 4/4) stiff SILTY CLAY with trace sand, fine gravel, root fragments and weathered wood fragments, cement cobble, moist, medium plasticity	CL	2.0	Top Hnu: 4.0 ppm, βγ: 1200 cpm, α: N/A cpm; Bottom Hnu: 4.4 ppm, βγ: 1200 cpm, α: 0 cpm. At about 14 feet the sampler hustel through a "liner" cobble sized piece of cement. Top Hnu: 4.4 ppm, βγ: 1800 cpm, α: 0 cpm; Bottom Hnu: 6.0 ppm, βγ: 1800 cpm, α: 0 cpm
				Continued on next page			Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Bob Ford

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083	morning: 4.0, afternoon: 4.0 ppm
BETA-GAMMA	75247	morning: 1000, afternoon: 1200 cpm
ALPHA	50747	0 cpm

ERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1615	COORDINATES: N 180617.01 E 1378464.87	DATE 4/18/91
ELEVATION: 578 ft above sea level	GWL: Depth Date/Time	DATE STARTED: 4/7/91
ENGINEER/GEOLOGIST: K. M. and G. M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 3 OF

DEPTH DRILLED AT 8° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	66957 66958 66959 66960 66961 66962		5.0	olive (5Y, 4/3) soft CLAY with trace organics and fine gravel, wet, high plasticity	CH	.25	Top: Hnu: 2.0 ppm, βγ: 1100 cpm, α: 0 cpm Bottom: Hnu: 2.0 ppm, βγ: 1100 cpm, α: 0 cpm
20.1	4/18/91 1100 Sequence No. 5			olive (5Y, 4/3) medium stiff CLAY with trace organics, moist, high plasticity	CH	.75	Top: Hnu: 2.0 ppm, βγ: 1100 cpm, α: 0 cpm Bottom: Hnu: 2.0 ppm, βγ: 1100 cpm, α: 0 cpm
22.5	66963 4/20/91 0955		4.0	Pale olive (5Y, 6/4) soft SILTY CLAY wet, medium plasticity	CL	2.5	Top: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm Bottom: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm
23.8	Sequence No. 6			Pale olive (5Y, 6/4) very stiff SILTY CLAY, moist, medium plasticity	CL	2.5	Top: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm Bottom: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm
26.5				No Recovery			
27.5	66964 4/20/91 0955		5.0	olive (5Y, 5/4) medium stiff SILTY CLAY with light gray (2.5, 7/1) mottling, moist, medium plasticity	CL	1.0	Top: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm Bottom: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm
29.8	Sequence No. 7			olive (5Y, 5/4) very stiff SILTY CLAY with light gray (2.5Y, 7/1) mottling, moist, medium plasticity	CL	1.75	Top: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm Bottom: Hnu: 0 ppm, βγ: 1200 cpm, α: 0 cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Bob Ford

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	711083 4/20: AC1344	2.0 0 ppm
BETA-GAMMA	73437 4/20:	1100 1200 cpm
ALPHA	50747	0 cpm

402-11-44

2126

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1615	COORDINATES: N 480617.01 E 1378464.87	DATE 4/20/91
ELEVATION: 578 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/7/91
ENGINEER/GEOLOGIST: G.M. and K.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 4 OF

DEPTH DRILLED AT & ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	66965 4/20/91 1045 Sequence No. 8		5.0	Light olive brown (2.5Y, 5/4) SILTY CLAY, with light gray (5Y, 7/1) mottling, moist, high plasticity. The first .3 ft of sample is wet	CL	1.25	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm, pH is 7. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm
36.0				Light olive brown (2.5Y, 5/4) SANDY CLAY with some gravel and light gray (5Y, 7/1) mottling, moist, medium plasticity	ML	2.5	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm
37.5	66966 66967 66968 66969 66970 66971 4/20/91 1455 Sequence No. 9		5.0	Light yellowish brown (2.5Y, 6/4) very soft SANDY CLAY with light gray (5Y, 7/1) mottling, saturated, high plasticity	CH	<.25	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm, pH is 7. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm
39.5				Light olive brown (2.5Y, 5/4) stiff CLAY with light gray (5Y, 7/1) mottling, wet, high plasticity	CH	2.0	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm
42.5	66972 4/20/91 1645 Sequence No. 10		5.0	Light yellowish brown (10YR, 6/4) medium stiff CLAY with trace silt, sand, and fossil fragments, light gray (5Y, 7/1) mottling, saturated, high plasticity	CH	1.0	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm, pH is 7. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm
45.5				Brown (10YR, 5/3) loose CLAYEY SAND, saturated	SC	N/A	Top: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm, pH is 7. Bottom: Hnu: 3.0 ppm, βγ: 1200 cpm, α: 0 cpm

NOTES:
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Bob Ford

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01344	0
	711083	3.0 ppm
BETA-GAMMA	73937	1200 cpm
ALPHA	50747	0 cpm

402-11-44

FERNALD
RI/FS

VISUAL CLASSIFICATION OF SOILS

2126

PROJECT NUMBER: 602.3.19	PROJECT NAME: FMPC RI/FS (K-65 Slant Borings)	
BORING NUMBER: 1615	COORDINATES: N 480617.01 E 1378404.87	DATE 4/22/91
ELEVATION: 578 ft. above sea level	GWL: Depth Date/Time	DATE STARTED: 4/7/91
ENGINEER/GEOLOGIST: K.M. and G.M.	Depth Date/Time	DATE COMPLETED:
DRILLING METHODS: Horizontal drill machine with 8 ¼ inch augers		PAGE 5 OF

DEPTH DRILLED AT 8° ANGLE	SAMPLE TYPE & NO	DEPTH FROM HORIZONTAL (ft)	RECOVERY (ft)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
48.5	66973 4/22/91 1040 sequence NO. 11		5.0	Yellowish brown (10YR, 5/4) loose CLAYEY SAND, saturated	SC	loose	Top Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; pH is 7
				Light yellowish brown (2.5Y, 6/4) very stiff CLAY with a little light gray (10YR, 7/1) mottling, moist, medium plasticity	CL	2.5	Top Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm
52.5	66975 4/22/91 1118 sequence NO. 12		5.0	Light olive brown (2.5Y, 5/3) very stiff CLAY with light gray (10YR, 6/1) mottling, moist, medium plasticity	CL	2.75	Top Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm
55				Light olive brown (2.5Y, 5/4) loose CLAYEY SAND and a little gravel, saturated	SC	loose	Top Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; Bottom Hnu: .1 ppm, βγ: 1200 cpm, α: 0 cpm; pH is 7
57.5							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm
							Top Hnu: ppm, βγ: cpm, α: cpm; Bottom Hnu: ppm, βγ: cpm, α: cpm

NOTES
- Borings sampled continuous using a 5.0 sampler
- Boring angle checked every 2 ft. using a slope indicator

Drilling Co: Pennsylvania Drilling
Driller: Dave Newman
Assistants: Bob Johnson, Bob Ford

INSTRUMENT	SERIAL NO.	BACKGROUND READINGS
Hnu	A01344	.1 ppm
BETA-GAMMA	73937	1200 cpm
ALPHA	50747	0 cpm

402-11-46