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**G-000-711.34**

**CONSOLIDATED CONSENT AGREEMENT/  
FEDERAL FACILITY COMPLIANCE AGREEMENT  
MONTHLY PROGRESS REPORT PERIOD ENDING  
JULY 31, 1990**

**08/17/90**

**113  
ENCLOSURE**

[REDACTED]

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**Introduction**

The Consent Agreement (CA) under the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) Section 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, 1990 and planned actions for the period August 1 through August 31, 1990.

Work completed in July includes the following:

- o The revised Plant 2/3 Removal Action Work Plan was transmitted to the U.S. EPA on July 17, 1990 for review and approval.
- o The revised Plant 9 Removal Action Work Plan was transmitted to the U.S. EPA on July 17, 1990 for review and approval.
- o The Draft Initial Screening of Alternatives Report for Operable Unit 1 was submitted to the U.S. EPA on July 23, 1990.

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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 1990. Information is presented for each of the four removal actions identified in the Consent Agreement, including:

- 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

**RA No. 1, Contaminated Water Beneath FMPC Buildings**

Plant 6 - Groundwater pumping activities from the three wells and the clarifier pit remained curtailed during July. The appropriate solution to the Hazardous Substance List/Volatile Organic Compounds (HSL/VOC) contamination concerns was investigated and the removal action work plan was modified in accordance with the U.S. EPA request of May 1990.

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RA No. 1, Contaminated Water Beneath FMPC Buildings

Plant 6 (cont'd).

The U.S. EPA comments were received on July 11, 1990. The modifications to the work plan identified sampling, analytical and treatability testing and the design/procurement/construction actions necessary to restart the pumping. Actions associated with the collection, analysis and laboratory testing of potential treatment technologies were initiated.

Plant 2/3 and Plant 9 - The RA work plans for Plant 2/3 and Plant 9 were submitted in early May for the U.S. EPA review and approval. However, the U.S. EPA comments on the two work plans were not received until June 19, 1990. The U.S. EPA disapproved the work plans as submitted and requested the DOE to submit revised work plans, incorporating their comments, and responsiveness summaries to the U.S. EPA within thirty days. Revised work plans for the Plant 9 and Plant 2/3 RAs were transmitted to the U.S. EPA and Ohio EPA on July 18, 1990.

Activities in August will center around responding to the U.S. EPA comments on the revised Plant 6 Work Plan and on the planning and engineering necessary to implement the activities for Plant 2/3, Plant 9 and Plant 6. Actions necessary to sample and analyze perched water from borings at Plant 2/3 and Plant 9 for additional hazardous substances will be initiated during August. Preliminary testing of potential groundwater treatment technologies is ongoing.

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Receive U.S. EPA comments/approval on Plant 6 Work Plan	Completed	July 11, 1990
Issue revised Plant 2/3 Work Plan for U.S. EPA review/approval	Completed	July 18, 1990
Receive U.S. EPA comments/approval on revised Plant 2/3 Work Plan	Open	August 17, 1990
Issue revised Plant 9 Work Plan for U.S. EPA review/approval	Completed	July 18, 1990

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**RA No. 1, Contaminated Water Beneath FMPC Buildings**

Plant 2/3 and Plant 9 (cont'd.)

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Issue revised Plant 6 Work Plan and responsiveness summary for U.S. EPA review/approval	Open On schedule	August 10, 1990
Receive U.S. EPA comments/approval on revised Plant 9 Work Plan	Open	August 17, 1990

**RA No. 2, Waste Pit Runoff Control**

The Engineering Evaluation/Cost Analysis (EE/CA) was prepared and submitted for U.S. EPA and public review on May 31, 1990. The U.S. EPA and public review period closed on July 2, 1990. A public workshop to discuss the Waste Pit Runoff Control EE/CA was held at the Crosby Elementary School on June 6, 1990. This workshop provided the public with pertinent information regarding the EE/CA process and the alternative selection process. The information session was followed by both an informal question and answer session and a formal verbal comment period. No formal verbal comments were received from the public at the meeting.

The U.S. EPA comments on the Waste Pit Runoff Control Removal Action EE/CA were received on July 11, 1990. Public comments on the Waste Pit Runoff Control Removal Action EE/CA were received on July 2, 1990.

Activities in August will center on the development and transmittal of the responsiveness summaries to the U.S. EPA and public comments and issuing a revised EE/CA to the U.S. EPA.

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Receive U.S. EPA comments/approval on Waste Pit Runoff Control EE/CA	Completed	July 11, 1990
Receive public comments on Waste Pit Runoff Control EE/CA	Completed	July 2, 1990
Issue responsiveness summary on U.S. EPA comments	Open On schedule	August 10, 1990

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

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Issue responsiveness summary on public comments	Open On schedule	August 10, 1990
Issue revised Waste Pit Runoff Control EE/CA	Open On schedule	August 10, 1990

RA No. 3, South Groundwater Contamination Plume

The extended public comment period for the South Plume EE/CA closed on June 18, 1990. The DOE formally requested a 45-day extension until August 1, 1990 to provide a responsiveness summary and a revised EE/CA to allow for the simultaneous incorporation of all review comments. On June 19, 1990, the U.S. EPA denied the request for the 45-day extension and granted a 15-day extension until July 2, 1990.

The DOE formally requested reconsideration of the extension request and notified the U.S. EPA of DOE intention to initiate informal dispute resolution on July 2, 1990. Informal dispute discussions were held between DOE and U.S. EPA representatives on July 27, 1990, followed by a letter from DOE to U.S. EPA on July 31, 1990. The revised EE/CA document will be submitted to the U.S. EPA and Ohio Environmental Protection Agency (EPA) on August 1, 1990.

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Issue responsiveness summary on U.S. EPA comments on South Plume EE/CA	On schedule	August 1, 1990
Issue responsiveness summary on public comments on South Plume EE/CA	On schedule	August 1, 1990
Issue revised South Plume EE/CA to the U.S. EPA	On schedule	August 1, 1990

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

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Receive U.S. EPA comments/approval on the South Plume EE/CA	Open	August 31, 1990

RA No. 4, Silos 1 and 2

Work progressed on the EE/CA document for the Silos 1 and 2 Removal Action. During July, the second draft of the Silos 1 and 2 EE/CA was submitted to U.S. Department of Energy-Headquarters (DOE-HQ) for review. A public workshop to discuss the K-65 Silos EE/CA will be conducted on August 16, 1990. The workshop will provide the public with pertinent information regarding the EE/CA process and the alternative selection process.

<u>KEY MILESTONES</u>	<u>STATUS</u>	<u>DATE</u>
Issue K-65 Silos EE/CA to the U.S. EPA	Open On schedule	August 1, 1990
Receive U.S. EPA comments/approval on the K-65 Silos EE/CA	Open	August 31, 1990
Receive public comments on the K-65 Silos EE/CA	Open	August 31, 1990

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

This section provides an update on Operable Unit (OU) and RI/FS Community Relations and Field Activities for July 1990. Status information is presented for each of the five Operable Units (OUs) identified in the Consent Agreement. The five Operable Units are:

- o Operable Unit 1 (OU 1): Waste Pits 1-6, clearwell, burn pit;
- o Operable Unit 2 (OU 2): Other Waste Units - (fly ash piles, lime sludge ponds, solid waste landfill, south field area);
- o Operable Unit 3 (OU 3): Production area and suspect areas outside production area (excluding the D&D of equipment and facilities but including effluent line to Great Miami River);
- o Operable Unit 4 (OU 4): Silos 1, 2, 3, and 4;
- o Operable Unit 5 (OU 5): All environmental media (i.e., including groundwater, surface water, soils, air, flora, fauna, etc.);

**RI/FS General Information**

Revision of the Feasibility Study (FS) Work Plan (August 1988) was initiated following receipt of U.S. EPA comments. This activity is currently on schedule for issuance to the U.S. EPA on August 9, 1990.

Consistent with a request from the U.S. EPA, DOE initiated activities to revise and update the RI/FS Quality Assurance Project Plan (QAPP). The revised QAPP is on schedule for issuance to the U.S. EPA on September 14, 1990.

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**Operable Unit 1: Waste Pits**

**1.1 Remedial Investigation**

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

A Document Change Request (DCR) to the RI/FS Work Plan for the completion of additional sampling in the waste pits was transmitted to the U.S. EPA on July 25, 1990.

The following activity was in progress during July 1990:

<u>Activity</u>	<u>Comments</u>
Issue Draft Remedial Investigation (RI) Report to U.S. EPA	Open, on schedule 35% complete

**b. Issue/Problems**

None to report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Continue preparation of the OU 1 Draft RI Report.

**1.2 Feasibility Study**

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

A revised listing of Applicable or Relevant and Appropriate Requirements (ARARs) for Operable Unit 1 was transmitted to the U.S. EPA on July 10, 1990. A meeting was held on July 13, 1990 at the U.S. EPA-Region V to further discuss ARARs for Operable Unit 1 originally discussed on June 19, 1990. A third meeting is tentatively scheduled for early August to resolve outstanding issues.

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Operable Unit 1: Waste Pits (cont'd.)

1.2 Feasibility Study (cont'd.)

a. **Status of Work - Key Milestones (cont'd).**

The following activities were completed or in progress during July 1990:

<u>Activity</u>	<u>Comment</u>
Issue Draft Initial Screening of Alternatives Report to U. S. EPA.	Completed July 23, 1990.
Present Detailed Analysis of Alternatives (DAA) to U.S. EPA.	Open, on schedule. 77% complete

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1990**

Complete OU 1 Detailed Analysis of Alternatives (DAA) presentation for internal project review.

Commence work on the Selection of Preferred Alternative.

Complete ARARs listing pertaining to OU 1 fully addressing U.S. EPA comments.

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Operable Unit 1: Waste Pits (cont'd.)

1.3 Risk Assessment

a. **Status of Work**

The following activities were in progress during July 1990:

Calculations were performed pertaining to construction and transportation risks for each alternative.

Assimilation of the Remedial Action Objectives and ARARS.

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1990**

Provide input for Detailed Analysis of Alternatives.

Continue work on the Baseline Risk Assessment for OU 1 RI Report.

**FMPC RI/FS FFA TRACKING**  
**OPERABLE UNIT 1 - WASTE STORAGE AREA**

ACTIVITY	FY 1990												FY 1991												FY 1992												% COMPL	
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	PUN	ACT
RI REPORT/RISK ASSESSMENT																																					35	35
TASK 12 - INITIAL SCREENING OF ALTs																																				100	100	
TASK 13 - DETAILED ANALYSIS OF ALTs																																				55	77	
TASK 14 - SELECTION OF PREFERRED ALT																																				0	0	
TASK 15/16 - FS REPORT																																				0	0	
TASK 17 - PROPOSED PLAN																																				0	0	
TASK 18 - RESPONSIVENESS SUMMARY																																				0	0	
TASK 19 - DRAFT RECORD OF DECISION																																				0	0	

LEGEND: [ ] PLANNED [ ] PROGRESS [ ] ASMT MILESTONE [ ] DOE MILESTONE [ ] DEL TO EPA [ ] PRIMARY DOCUMENT [ ] DOE MAY EXTEND 30 DAYS [ ] SECONDARY DOCUMENT/PRESENTATION

NOTES: [ ]

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Operable Unit 2: Other Waste Units

2.1 Remedial Investigation

a. Status of Work - Key Milestones

A DCR to the RI/FS Work Plan for the completion of additional sampling on the Operable Unit 2 facilities was transmitted to the U.S. EPA on July 25, 1990.

Activity

Comment

Issue Draft OU 2 RI Report  
to U.S. EPA.

Open, on schedule  
54% complete. Draft report in  
internal review.

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for August 1990

Activities on the preparation of the Draft RI Report will continue with the compilation and resolution of internal review comments.

2.2 Feasibility Study

a. Status of Work - Key Milestones

The following activities were in progress during July 1990:

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**Operable Unit 2: Other Waste Units (cont'd.)**

**2.2 Feasibility Study (cont'd.)**

**a. Status of Work - Key Milestones (cont'd.)**

<u>Activity</u>	<u>Comment</u>
Issue Draft Initial Screening of Alternatives Report	Open, on schedule 93% complete
Present the Detailed Analysis of Alternatives to U.S. EPA	Open, on schedule 79% complete
Meet with U.S. EPA on ARARs	On schedule for August 1990

**b. Issues/Problems**

None to report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Activities related to the Selection of the Preferred Alternative will be initiated.

Preparation of the Draft FS Report will be initiated.

A proposed listing of ARARs for Operable Unit 2 is being compiled. A meeting to discuss the ARARs is tentatively scheduled for early August.

Transmittal of listing of proposed ARARs for Operable Unit 2 to the U.S. EPA.

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**Operable Unit 2: Other Waste Units (cont'd.)**

**2.3 Risk Assessment**

**a. Status of Work**

Risk assessment activities related to the Detailed Analysis of Alternatives are proceeding toward completion.

**b. Issues/Problems**

None to report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Risk Assessment activities relating to the Detailed Analysis of Alternatives will be completed in August.

Internally generated review comments on the Baseline Risk Assessment will be resolved and appropriate revisions made to the draft document.



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**Operable Unit 3: Production Area and Suspect Areas**

**3.1 Remedial Investigation**

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

Progress to date is consistent with scheduled commitments. Tabulation and evaluation of perched groundwater data continued in July.

Activity

Comment

Issue OU 3 RI Report to  
U.S. EPA

Open, on schedule  
13% complete.

**b. Issues/Problems**

None to report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Preparation of Chapter 4, "Nature and Extent of Contamination," of the RI Report will be initiated in August.

**3.2 Feasibility Study**

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

Progress on the preparation of the Draft Initial Screening of Alternatives Report was slightly ahead of schedule as of July 31, 1990. Activities related to the Detailed Analysis of Alternatives continued on schedule during July.

Activity

Comment

Issue Draft Initial Screening  
of Alternatives Report to  
U.S. EPA.

Open, on schedule  
79% complete

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Operable Unit 3: Production Area and Suspect Areas (cont'd.)

3.2 Feasibility Study (cont'd.)

a. Status of Work - Key Milestones (cont'd.)

<u>Activity</u>	<u>Comment</u>
Complete the Detailed Analysis of Alternatives Presentation to U.S. EPA	Open, on schedule 22% complete
Meet with U.S. EPA on ARARs	On schedule for August 24, 1990

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for August 1990

The Draft Initial Screening of Alternatives Report is scheduled to be submitted for DOE HQ final review on August 6, 1990.

Development of work plans for treatability testing will be initiated in August.

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Operable Unit 3: Production Area and Suspect Areas (cont'd.)

3.3 Risk Assessment

a. Status of Work

Progress on the Baseline Risk Assessment during July was consistent with scheduled commitments. Risk Assessment information was developed in July in order to initiate groundwater fate and transport modeling.

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for August 1990

Continue work on Baseline Risk Assessment.

**FMPC RIIFS FFA TRACKING  
 OPERABLE UNIT 3 - PRODUCTION AND SUSPECT AREAS**

ACTIVITY	FY 1990			FY 1991			FY 1992			% COMPL				
	O	N	D	J	F	M	A	M	J	J	A	S	PLN	ACT
RI REPORT/RISK ASSESSMENT													10	13
TASK 12 - INITIAL SCREENING OF ALTs													75	79
TASK 13 - DETAILED ANALYSIS OF ALTs													21	22
TASK 14 - SELECTION OF PREFERRED ALT													0	0
TASK 15/16 - FS REPORT													0	0
TASK 17 - PROPOSED PLAN													0	0
TASK 18 - RESPONSIVENESS SUMMARY													0	0
TASK 19 - DRAFT RECORD OF DECISION													0	0

LEGEND:  PLANNED  ASMT MILESTONE  DEL TO EPA  PRIMARY DOCUMENT  
 PROGRESS  DOE MILESTONE  DOE MAY EXTEND 30 DAYS  
 SECONDARY DOCUMENT/PRESENTATION

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

4.1 Remedial Investigation

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

The procedures for completing the sampling of the K-65 berms, subsoils and internal contents (residues) were hand carried to the Ohio EPA and the U.S. EPA on July 18, 1990 and formally transmitted to the U.S. EPA for approval on July 25, 1990. Approval of the berm, subsoil and residue sampling procedures were received from the Ohio EPA on July 26, 1990. As of July 31, 1990, approval had not been received from the U.S. EPA on the sampling procedures.

Activity

Comment

Issue Draft RI Report  
to U.S. EPA

Open, on schedule  
89% complete

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

d. **Planned Activities for August 1990**

Transmit the RI report for the U.S. EPA review.

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

4.2 Feasibility Study

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

A presentation on the Detailed Analysis of Alternatives for OU 4 was made to the U.S. EPA and the Ohio EPA on July 18, 1990. The U.S. EPA and Ohio EPA comments were incorporated into the Initial Screening of Alternatives Report.

A meeting was held on July 27, 1990 with the U.S. EPA in Chicago to discuss ARARs on Operable Unit 4. A follow-up meeting to resolve outstanding issues was tentatively scheduled for August 8, 1990.

<u>Activity</u>	<u>Comment</u>
Present Detailed Analysis of Alternatives to U.S. EPA	Completed July 18, 1990
Meeting with U.S. EPA on ARARs	Completed July 27, 1990
Submit Revised Initial Screening of Alternatives to U.S. EPA	On schedule for August 1990

b. **Issues/Problems**

None to report.

c. **Corrective Actions**

None required.

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

**4.2 Feasibility Study (cont'd.)**

**d. Planned Activities for August 1990**

Incorporate the U.S. EPA and the Ohio EPA comments on the Detailed Analysis of Alternatives presentation into the Draft FS Report upon receipt.

Submit the Draft Final Initial Screening of Alternatives Report to the U.S. EPA and the Ohio EPA following incorporation of their comments.

Meet with the U.S. EPA on August 8, 1990 to discuss outstanding issues relative to ARARs for Operable Unit 4.

**4.3 Risk Assessment**

**a. Status of Work**

The draft Baseline Risk Assessment was completed and incorporated into the Draft RI Report as an appendix.

**b. Issues/Problems**

Geochemical modeling and groundwater transport modeling for the till layer have produced potentially unrealistic concentration projections at the receptor exposure point.

**c. Corrective Actions**

Model input parameters are being reassessed and additional data needs evaluated in order to refine the leachate calculation model for the silo residues.

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Operable Unit 4: Silos 1, 2, 3, and 4 (cont'd.)

4.3 Risk Assessment (cont'd.)

d. **Planned Activities for August 1990**

Estimate the risks to the public and workers resulting from remedial alternatives being evaluated under the FS.

Prepare the FS Risk Assessment as an appendix to Draft FS Report.

Refine the risk-based remedial action objectives for Operable Unit 4.

Provide risk assessment input to the Detailed Analysis of Alternatives in response to the U.S. EPA and Ohio EPA comments.

**FMPC RIIFS FFA TRACKING  
 OPERABLE UNIT 4 - WASTE STORAGE SILOS**

ACTIVITY	FY 1990												FY 1991												FY 1992												% COMPL					
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	P	L	N	A	C	T
	[Gantt bars for FY 1990]												[Gantt bars for FY 1991]												[Gantt bars for FY 1992]												75	89				
RI REPORT/RISK ASSESSMENT	[Gantt bar: Oct 1990 - Dec 1990]												[Gantt bar: Jan 1991 - Mar 1991]												[Gantt bar: Apr 1992 - Jun 1992]												75	89				
TASK 12 - INITIAL SCREENING OF ALTs	[Gantt bar: Nov 1990 - Dec 1990]												[Gantt bar: Jan 1991 - Feb 1991]												[Gantt bar: Mar 1992 - Apr 1992]												100	100				
TASK 13 - DETAILED ANALYSIS OF ALTs	[Gantt bar: Dec 1990 - Feb 1991]												[Gantt bar: Mar 1991 - May 1991]												[Gantt bar: Jun 1992 - Aug 1992]												100	100				
TASK 14 - SELECTION OF PREFERRED ALT	[Gantt bar: Jan 1991 - Feb 1991]												[Gantt bar: Mar 1991 - Apr 1991]												[Gantt bar: May 1992 - Jun 1992]												75	70				
TASK 15/16 - FS REPORT	[Gantt bar: Dec 1990 - Jan 1991]												[Gantt bar: Feb 1991 - Mar 1991]												[Gantt bar: Apr 1992 - May 1992]												50	51				
TASK 17 - PROPOSED PLAN	[Gantt bar: Jan 1991 - Feb 1991]												[Gantt bar: Mar 1991 - Apr 1991]												[Gantt bar: May 1992 - Jun 1992]												5	0				
TASK 18 - RESPONSIVENESS SUMMARY	[Gantt bar: Feb 1991 - Mar 1991]												[Gantt bar: Apr 1991 - May 1991]												[Gantt bar: Jun 1992 - Jul 1992]												0	0				
TASK 19 - DRAFT RECORD OF DECISION	[Gantt bar: Mar 1991 - Apr 1991]												[Gantt bar: May 1991 - Jun 1991]												[Gantt bar: Jul 1992 - Aug 1992]												0	0				

LEGEND:  PLANNED  PROGRESS

NOTES: \* - PRIMARY DOCUMENT  
 \*\* DOE MAY EXTEND 20 DAYS  
 † - SECONDARY DOCUMENT/PRESENTATION

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Operable Unit 5: All Environmental Media

5.1 Remedial Investigation

a. Status of Work - Key Milestones

<u>Activity</u>	<u>Comment</u>
Issue Draft RI Report to U.S. EPA	Open, on schedule 41% complete

b. Issues/Problems

None to report.

c. Corrective Actions

None required.

d. Planned Activities for August 1990

Continue work on the Draft RI Report.

5.2 Feasibility Study

a. Status of Work - Key Milestones

A listing of proposed ARARs for Operable Unit 5 was transmitted to the U.S. EPA on July 25, 1990. A meeting with the U.S. EPA was scheduled to discuss the proposed ARARs on July 27, 1990.

<u>Activity</u>	<u>Comment</u>
Issue Draft Initial Screening of Alternatives Report to U.S. EPA	Open, on schedule 93% complete
Present Detailed Analysis of Alternatives to U.S. EPA	Open, on schedule 44% complete
Conduct ARARs meeting with U.S. EPA	Open

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**Operable Unit 5: All Environmental Media (cont'd.)**

**5.2 Feasibility Study (cont'd.)**

**b. Issues/Problems**

None to Report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Submit Draft Initial Screening of Alternative Report to the U.S. EPA on August 27, 1990.

Continue work on Detailed Analysis of Alternatives.

Incorporate the U.S. EPA comments into proposed ARARs listing.

**5.3 Risk Assessment**

**a. Status of Work**

Progress on the baseline risk assessment included preparation of the toxicity assessment for contaminants of concern and compilation of surface soil data.

**b. Issues/Concerns**

Technical work related to geochemical modeling and contaminant transport modeling in the till is proceeding slower than originally anticipated. Completion of the necessary groundwater and geochemical modeling to support the OU 5 Risk Assessment Report is on the critical path of the project schedule.

**c. Corrective Actions**

The problem has been identified and additional employees have been assigned to the groundwater modeling team to work on the completion of this subtask.

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Operable Unit 5: All Environmental Media (cont'd.)

5.3 Risk Assessment (cont'd.)

d. **Planned Activities for August 1990**

Continue work on baseline risk assessment.

Continue to work on FS risk assessment.

Incorporate groundwater pathway into the baseline risk assessment for fate and transport calculation.

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**FMPC RI/IFS FFA TRACKING  
 OPERABLE UNIT 5 - ENVIRONMENTAL MEDIA**

ACTIVITY	FY 1990												FY 1991												FY 1992												% COMPL	
	OND	J	F	M	A	M	J	J	A	S	OND	J	F	M	A	M	J	J	A	S	OND	J	F	M	A	M	J	J	A	S								
	[Gantt chart for FY 1990]												[Gantt chart for FY 1991]												[Gantt chart for FY 1992]												PLN	ACT
RI REPORT/RISK ASSESSMENT																															32	61						
TASK 12 - INITIAL SCREENING OF ALTs																															90	93						
TASK 13 - DETAILED ANALYSIS OF ALTs																															38	44						
TASK 14 - SELECTION OF PREFERRED ALT																															0	0						
TASK 15/16 - FS REPORT																															0	0						
TASK 17 - PROPOSED PLAN																															0	0						
TASK 18 - RESPONSIVENESS SUMMARY																															0	0						
TASK 19 - DRAFT RECORD OF DECISION																															0	0						

LEGEND:  PLANNED  ASMT MILESTONE  DEL TO EPA  PRIMARY DOCUMENT  
 PROGRESS  DOE MILESTONE  \*\* DOE MAY EXTEND 30 DAYS  
 † - SECONDARY DOCUMENT/PRESENTATION

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RI/FS Community Relations

6.1/6.2 Remedial Investigation

a. Status of Work - Key Milestones

May 22, 1990 RI/FS Community Meeting Follow-up:

One letter remains to be transmitted to a local resident in follow-up to a comment provided at the community meeting.

Identified flipchart questions for inclusion in first issue of FMPC Cleanup Update

Waste Pit Removal Action EE/CA:

Public comments received during the public comment period, May 30 - July 2, were provided to appropriate technical staff for inclusion in Responsiveness Summary.

K-65 Silos Removal Action EE/CA:

Set August 16 as date for community workshop to be held at the Plantation Restaurant.

RI/FS Community Relations Plan:

Received the U.S. EPA comments on the Community Relation Plan on July 12, 1990. Revised plan addressing the comments to be issued by August 10, 1990.

Other Activity:

The RI/FS contractor participated in July 26, 1990 Fernald Residents for Environmental Safety and Health (FRESH) meeting; distributed RI/FS Community Relations calendar through December 1990.

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

**6.1/6.2 Remedial Investigation (cont'd.)**

**a. Status of Work - Key Milestones (cont'd.)**

Other Activity: (cont'd)

Congressional Hearing, chaired by Rep. Tom Luken, was held at the Crosby Township Elementary School on July 5, 1990. A tour of the FMPC by Rep. Luken and representatives of FRESH preceded the Congressional Hearing.

**b. Issues/Problems**

None to report.

**c. Corrective Actions**

None required.

**d. Planned Activities for August 1990**

Submit South Plume EE/CA Responsiveness Summary to the U.S. EPA August 1; distribute revised EE/CA and Responsiveness Summary to community members per request; issue Administrative Record Notice of Availability (NOA).

Submit Waste Pit EE/CA Responsiveness Summary to the U.S. EPA on August 10; distribute revised EE/CA and Responsiveness Summary to community members per request; issue Administrative Record NOA.

Submit Revised RI/FS Community Relations Plan to the U.S. EPA and deliver to Administrative Record on August 10.

Make preparation for Fall RI/FS Community Meeting which will be held in conjunction with an Open House on September 22, 1990.

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RI/FS Community Relations (cont'd.)

6.1/6.2 Remedial Investigation (cont'd.)

d. Planned Activities for August 1990 (cont'd.)

Hold K-65 Silos EE/CA Workshop on August 16; a brief presentation on the FMPC Site Specific Plan (SSP) will be included.

Issue the FMPC Site Specific Plan NOA and announce public comment period.

Issue NOA for K-65 EE/CA.

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Field Activities

Surveying Activities

Surveying activities continued during July on establishing the horizontal and vertical coordinates for borings and installed monitoring wells.

K-65 Sampling

Procedures for the completion of sampling of the K-65 berms, subsoils and internal contents were hand carried to the U.S. EPA and Ohio EPA on July 18, 1990 and formally transmitted to the U.S. EPA on July 25, 1990.

Monitoring Wells Installations -Task 3.2.1

Cable-tool installations continued during July on contingency wells in the 31-well program and on wells in the South Plume study. A total of eight monitoring wells were installed (three were in the South Plume area and five were part of the 31-well program). Table 1 summarizes the monitoring well drilling status for July 1990. Boring logs as to locations can be found in Enclosure C.

TABLE 1: MONITORING WELL INSTALLATIONS

<u>Monitoring Well No.</u>	<u>Date Completed</u>	<u>Depth Drilled (Ft.)</u>	<u>Depth to Bottom of Casing (Ft.)</u>
3385	7-01-90	126.7	126.7
4108	7-13-90	117.0	116.0
2389	7-15-90	71.5	69.0
3396	7-19-90	91.5	80.0
2393	7-24-90	29.0	27.4
2396	7-26-90	25.0	21.0
2397	7-29-90	70.0	64.5
3390	7-31-90	120.5	115.1

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**Field Activities (cont'd.)**

**Monitoring Well Development - Task 3.2.1**

During July, three monitoring wells were developed: Wells 4108, 4125, and Well 3385. The wells were sampled after development for full Radiological and General Water Quality parameters. Table 2 summarizes the wells developed during July.

**TABLE 2: MONITORING WELL DEVELOPMENT**

<u>Monitoring Well Developed</u>	<u>Date Started</u>	<u>Date Completed</u>
4125	7-02-90	7-13-90
3385	7-14-90	7-24-90
4108	7-25-90	7-30-90

**Facility Testing Drilling Program - Task 3.7**

The Facility Testing Drilling Program continued during July with three borings completed. Boring 1277 had to be redrilled after the original was accidentally damaged. Boring 1286 was completed in Building 69 (Decontamination Building) with no water being encountered during drilling. Boring 1292 was completed just south of Building 69 and no water was encountered while drilling. Table 3 summarizes the Facility Testing Boring Program for July 1990. Boring logs can be found in Enclosure C.

**TABLE 3: FACILITY TESTING DRILLING PROGRAM**

<u>Boring No.</u>	<u>Date Completed</u>	<u>Depth Drilled (Ft.)</u>	<u>Piezometer Installed Yes/No</u>	<u>Sector No.</u>
1277 (Redrill)	7-13-90	9.0	Yes	4
1292	7-15-90	20.0	No	4
1286	7-29-90	20.0	No	4

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Field Activities (cont'd).

Water Sampling: Facility Testing Task 3.7.4

During July, a total of 17 piezometers were sampled. Most piezometers were in the production area with the exception of one piezometer located at the Laboratory Burial Area, No. 1523.

Geochemical Boring Program - Task 3.7.5

The Geochemical Boring and Sampling Program continued in July in areas of suspected soluble uranium spills. No piezometers were set at these locations under the guidelines of the Geochemical Boring Program. Table 4 summarizes the Geochemical Borings drilled in July 1990. Boring logs can be found in Enclosure C.

TABLE 4: GEOCHEMICAL BORING AND SAMPLING

<u>Boring No.</u>	<u>Date Completed</u>	<u>Depth Drilled and Sampled (Ft.)</u>
1502	7-10-90	20.0
1503	7-01-90	20.0

Water Level Measurements: Monitoring Wells and Piezometers

Three hundred twenty-one (321) water level measurements were completed. These included both monitoring wells and piezometers contained in the RI/FS.

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

**CONSOLIDATED CONSENT AGREEMENT/FEDERAL FACILITY  
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Period Ending July 31, 1990

**Introduction**

In accordance with the requirements of Section XXIII.B of the Consent Agreement under CERCLA Section 120 and 106(a), Enclosure A with its accompanying tables provides (1) data on the daily wastewater flows and radionuclide concentrations and loadings released to the Great Miami River and an estimate of runoff and radionuclide concentrations to Paddy's Run during July 1990.

**Summary - July 1990**

The total quantity of uranium discharged from the FMPC to the Great Miami River via Manhole 175 (Outfall 1I000004001) was 52.01 kilograms. The average uranium concentration for the previous twelve months in the discharges from Manhole 175 was 0.80 mg/l. This is 89.9 percent of the Derived Concentration Guide (DOE Order 5400.5) for ingested water.

There was no discharge from the Stormwater Retention Basin (Outfall 1I000004002) to Paddy's Run via the Storm Sewer Outfall Ditch during July 1990. Based on 3.65 inches of rainfall in July 1990, the total quantity of uranium discharged to Paddy's Run from uncontrolled areas of the FMPC is estimated to be 16.42 kilograms.

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**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  
8502 M 8612 801002

**LOCATION:** 1I000004001; 001 Total Discharge  
Manhole 175 (Effluent to Great Miami River)                      **MONTH:** July 1990

<u>Day</u>	<u>Flow (MGD)</u>	<u>Total Alpha (pCi/l)</u>	<u>Total Beta (pCi/l)</u>	<u>Total U (mg/l)</u>	<u>Total U (kgs)</u>	<u>Calculated Total U-238 (pCi/l) (1)</u>
1	0.592	437	320	0.96	2.15	324
2	0.560	365	176	0.78	1.65	264
3	0.634	419	333	0.86	2.06	291
4	0.655	505	225	1.00	2.48	338
5	0.227	865	437	1.64	1.41	554
6	0.417	550	387	0.94	1.48	318
7	0.700	365	144	0.48	1.27	162
8	0.480	419	180	0.68	1.23	230
9	0.217	694	486	1.24	1.02	419
10	0.195	892	527	1.84	1.36	622
11	0.320	486	410	1.00	1.21	338
12	0.167	532	477	1.08	0.68	365
13	0.389	437	396	0.98	1.44	331
14	0.907	297	144	0.72	2.47	243
15	1.066	347	176	0.82	3.31	277
16	0.885	311	207	0.32	1.07	108
17	0.756	297	176	0.36	1.03	122
18	0.997	437	144	0.38	1.43	128
19	1.032	414	149	0.52	2.03	176
20	1.026	410	225	0.50	1.94	169
21	0.989	333	135	0.34	1.27	115
22	0.920	284	135	0.32	1.11	108
23	0.962	167	135	0.36	1.31	122
24	0.971	288	135	0.42	1.54	142
25	0.639	324	293	0.56	1.35	189
26	0.902	509	302	0.86	2.93	291
27	1.063	369	203	0.70	2.81	236
28	1.083	369	203	0.50	2.05	169
29	1.175	437	140	0.70	3.11	236
30	0.251	689	297	1.08	1.03	365
31	<u>0.368</u>	441	288	0.54	<u>0.75</u>	182
<b>Total</b>	<b>21.545</b>				<b>52.01</b>	

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**Wastewater Flows and Radionuclide Concentrations (cont.)**

FACILITY: Feed Materials Production Center

LOCATION: 001 Total Discharge

MONTH: July 1990

	<u>Flow (MGD)</u>	<u>Total Alpha (pCi/l)(2)</u>	<u>Total Beta (pCi/l)(2)</u>	<u>Total U (mg/l)(2)</u>	<u>Total U (kgs)</u>	<u>Calculated Total U-238 (pCi/l)(1)(2)</u>
Avg.	0.695	392	213	0.64	1.68	216
Max.	1.175	892	527	1.84	3.31	622
Min.	0.167	167	135	0.32	0.68	108

The average uranium concentration for the previous twelve months was 0.80 mg/l. This is 89.9 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 applied to the measured value of total uranium.
- (2) Average values presented are flow-weighted.

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**Wastewater Flows and Radionuclide Concentrations (cont.)**

**FACILITY:** Feed Materials Production Center, U.S. Department of Energy  
7400 Willey Road, P.O. Box 398704  
Cincinnati, Ohio 45239 Hamilton  
8502 M 8612 801002

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

**MONTH:** July 1990

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

Based on 3.65 inches of rainfall in July, the uranium discharge to Paddy's Run from uncontrolled areas of the FMPC is estimated to be 16.42 kgs.

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**PERIOD ENDING JULY 31, 1990**

**ENCLOSURE B**

**FFCA: INITIAL REMEDIAL MEASURES  
AND OTHER OPEN ACTIONS**

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**INTRODUCTION**

Enclosure B describes actions undertaken at the Feed Materials Production Center (FMPC) during the period July 1 through July 31, 1990 that are not covered by the reporting requirements of the Consent Agreement under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 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 both ongoing and completed work in support of the Federal Facility Compliance Agreement (FFCA) is summarized in Table 1 of Enclosure B. 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 - Final review comments on the K-65 Silo embankment and subsoils sampling and analysis work plan are being incorporated by Advanced Sciences, Inc./International Technology (ASI/IT).

The work plan for the Treatability Testing on the K-65 materials is being revised by ASI/IT to reflect final internal review comments.

The K-65 Sampling work plan for the resampling of the silos was submitted to the U.S. EPA and the Ohio EPA in July 1990.

The cracked pipe that was removed from the Radon Treatment System (RTS) in June was replaced in July. The RTS was isolated from the K-65 silos in order to perform integrity checks on the system without risk of radon release and to anchor the system for added support.

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

1. Initial Remedial Measures (cont'd).

*Section C*

K-65 Silo Project (cont'd).

The clean-up of the K-65 Silo area in support of the resampling effort was completed in July.

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 Section 120 and 106(a).

3. Reports and Record Keeping

*Section B*

The RI/FS Monthly Technical Progress Report for June 1990 was transmitted to U.S. EPA on July 20, 1990 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.

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**CLEAN AIR ACT (CAA)**

*Section C*

The Annual NESHAP Compliance Report for CY 1989 was transmitted to the U.S. EPA on July 9, 1990.

*Section E*

The fifteenth Quarterly Particulate Emissions Report for the period April 3, 1990 through July 3, 1990 is on schedule for submittal to the U.S. EPA in August 1990.

**RADIATION DISCHARGE INFORMATION**

*Section A*

The fifteenth Quarterly Liquid Discharge Report for the period April through June 1990 is on schedule for submittal to the U.S. EPA in August 1990.

**REPORTING REQUIREMENTS**

*Section B*

The Federal Facilities Compliance Agreement Monthly Progress Report for June 1990 was transmitted to the U.S. EPA on July 20, 1990 as Attachment 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, 1990**

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY90 STATUS
CERCLA			
1.	INITIAL REMEDIAL MEASURES		
1.A	Develop and implement O&M procedures and work practices to control radioactive emissions, including radon gas and decay products.	60 days	Completed.
1.B	Develop and provide to U.S. EPA a plan and implementation schedule for the interim control of radon at the K-65 Silos.	30 days	Completed.
	Develop and provide to U.S. EPA a plan and implementation schedule for control of thorium compounds.		Completed.
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.
	Implement interim control plan for thorium compounds as approved by the U.S. EPA.		Completed.
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.C	Provide to U.S. EPA the analysis results for Laboratory certification -- SOW Task 7b.	45 days	Completed.
2.D	Submit a work plan to U.S. EPA for a complete sitewide RI/FS.	90 days	Completed.
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).

TABLE 1

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

**STATUS OF ACTIONS AS OF  
JULY 31, 1990**

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY90 STATUS
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 1990 was transmitted to the U.S. EPA on July 20, 1990 (DOE-1452-90).
CLEAN AIR ACT			
A.	--No Action Required --	-----	
B.1	Install real-time alarm monitors on all MAJOR emission points. Also list non-alarm emission points.	30 days	Completed.
B.2	Establish and implement administrative controls for real-time monitors to ensure any unplanned releases will be detected and dealt with in 24 hours.	30 days	Completed.
	Establish and implement sample collection and analysis procedures and a QA plan to monitor ALL radionuclide emission points.	30 days	Completed.
B.4	Establish schedule for the installation and replacement of emission control devices.	30 days	Completed.
	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 22, 1990 (DOE-617-90).
	Respond to U.S. EPA comments on Air Monitoring Network (WDF-JAR dated 12-May-87).		Completed.
C.	Provide annual reports to U.S. EPA per 40 CFR 61.94(c).	yearly	The Annual NESHAP Compliance Report for CY 1989 was transmitted to the U.S. EPA on July 9, 1990 (DOE-1392-90).

TABLE 1

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

**STATUS OF ACTIONS AS OF  
JULY 31, 1990**

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY90 STATUS
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 production at the FMPC is made.
D.2	Provide U.S. EPA with stack-test results for stacks tested that year.	45 days after test	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.
E.1	Maintain records of monthly particulate matter emissions.	-----	Continuing.
E.2	Provide quarterly reports to U.S. EPA on these emissions.	quarterly	The thirteenth Quarterly Particulate Emissions Report was transmitted to the U.S. EPA on February 28, 1990. The fourteenth Quarterly Particulate Emissions Report for the period January 3, 1990 through April 3, 1990 was transmitted to the U.S. EPA on May 18, 1990 (DOE-1121-90).
	Provide U.S. EPA with a list of environmental air monitoring equipment, including location and the O&M program.	60 days	Completed.
G.	Develop and provide U.S. EPA with an O&M program for air pollution control devices.	90 days	Completed.
RCRA			
A.	Achieve compliance with interim status regulations.	30 days	Completed.
A.1	Conduct a hazardous waste determination 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.

TABLE 1

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

**STATUS OF ACTIONS AS OF  
JULY 31, 1990**

<u>ACTION</u>	<u>DESCRIPTION</u>	<u>COMPLETION TIME AFTER FFCA SIGNED</u>	<u>FY90 STATUS</u>
A.3	Update operating records pursuant to 40 CFR 265.73 and 265.309.	30 days	Completed.
A.4	Include full name, signature, and date received on manifests pursuant to 40 CFR 265.71.	30 days	Completed.
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.
A.6	Begin collection of all run-off from the active portions of Pit 4.	30 days	Completed.
A.7	Prepare and maintain an outline for a groundwater quality assessment program.	30 days	Completed.
B.	Submit to U.S. EPA for approval a detailed groundwater monitoring plan.	90 days	Completed. Revision 1 of the Groundwater Quality Assessment Program Plan was submitted to U.S. EPA on March 24, 1989 to fulfill comments received from the U.S. EPA in 2/89.
B.1	Determine groundwater flow at the RCRA-regulated units.	90 days	Completed.
B.2	Provide a map showing the locations of all RCRA monitoring wells.	90 days	Completed.
B.3	Include design and construction specifications for all RCRA wells.	90 days	Completed.
B.4	Monitor for all Appendix VIII constituents, including radionuclides.	90 days	Completed.
B.5	Include a sampling and analysis plan to met 40 CFR 265.92.	90 days	Completed.
C.1	Develop a closure plan for the landfill pursuant to 40 CFR 265.112.	60 days	Completed.
	Develop a post-closure plan for the landfill pursuant to 40 CFR 265.118.	60 days	Completed. The post-closure plan for Waste Pit 4 was submitted as part of RCRA Part B Permit Application which was transmitted to Ohio EPA on September 22, 1989 (DOE-1653-89).

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

**STATUS OF ACTIONS AS OF  
JULY 31, 1990**

ACTION	DESCRIPTION	COMPLETION TIME AFTER FFCA SIGNED	FY90 STATUS
<b>RADIATION DISCHARGE INFORMATION</b>			
A.	Respond to U.S. EPA comments on Items A.1. - A.3. (WDF-JAR dated May 12, 1987).	Completed.	
A.1	Provide U.S. EPA with existing offsite environmental monitoring program.	30 days	Completed.
A.2	Provide U.S. EPA the QA program associated with the environmental monitoring program.	30 days	Completed.
A.3	Report to U.S. EPA, Ohio EPA and Ohio Department of Health the results of the continuous liquid discharge samples.	quarterly	The thirteenth Quarterly Liquid Discharge Report was transmitted to the U.S. EPA on February 28, 1990. The fourteenth Quarterly Liquid Discharge Report for the period January through March 1990 was transmitted to the U.S. EPA on May 18, 1990 (DOE-1121-90).
<b>REPORTING REQUIREMENTS</b>			
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 20, 1990 (DOE-1452-90).

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

**PERIOD ENDING JULY 31, 1990**

**ENCLOSURE C  
DRILLING AND BORING LOGS**



**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS
BOHING NUMBER: 3385	COORDINATES:
ELEVATION:	GWL Depth Date/Time
ENGINEER/GEOLOGIST: M. SWANSON	Date/Time
DRILLING METHODS: CABLE TOOL	DATE STARTED: 6-5-90
	DATE COMPLETED: 7-1-90
	PAGE 2 OF 8

DEPTH (FT)	SAMPLE TYPE & NO	HOWSON SAMPLE PER (6 IN)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (PS)	WELL CONSTRUCTION	REMARKS
75	32724	10		DENSE, DARK GRAYISH BROWN (10YR 4/2), WELL-GRADED COARSE SAND, SOME SUBROUNDED PEBBLES AND COBBLES, TRACE OF SILT, SATURATED	SW	N/A		H <sub>25</sub> = 0.8 ppm α = 0 cpm βγ = 80-100 cpm
76	1325	21	18					
	6-13-40	23						
77								
78								
79								
80	32725	4		DENSE, DARK GRAY (10YR 4/1) POORLY GRADED FINE SAND, SOME SUBROUNDED PEBBLES, SATURATED.	SP	N/A		H <sub>20</sub> = 0.8 ppm α = 0 cpm βγ = 80-90 cpm
81	1357	18	16					
	6-13	24						
82								
83								
84								
85	32726	18		Dense, Dark brown (10YR 4/3) well graded coarse sand, some subrounded pebbles, trace silt, saturated	sw	N/A		H <sub>25</sub> = 1.0 ppm α = 0 cpm βγ = 60-80 cpm
86	1552	19	22					
	6-13	22						
87								
88								
89								
90								

**NOTES.**

Drilling Contractor: PEW DRILL CO.  
 Drilling Equipment: BOYRUS GALE  
 Driller: A. NEWMAN  
ASST. B. JOHNSON

ALL SOIL SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST. SOIL SAMPLE COLORS IDENTIFIED USING Munsell COLOR CHARTS.

INSTRUMENT	SERIAL #	BACKGROUND READING
H <sub>25</sub>	A01344	0.2 - 1.0 ppm
α	4, 4	0 cpm
βγ	B, B	40-100 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <b>602 3.2.1</b>	PROJECT NAME: <b>FMP/ RI/FS</b>
BORING NUMBER: <b>5385</b>	COORDINATES: _____
ELEVATION: _____	GWL: Depth _____ Date/Time _____
ENGINEER/GEOLOGIST: <b>M. SWANSON</b>	DATE STARTED: <b>6-5-90</b>
DRILLING METHODS: <b>CABLE TOOL</b>	DATE COMPLETED: <b>7-1-90</b>
PAGE <b>3</b> OF <b>8</b>	

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER (6 IN)	RECOVERY (%)	DESCRIPTION	USE SYMBOL	MEASURED COMPACTENCY (%)	WELL CONSTRUCTION	REMARKS
80	32727 1710 6-13	18 20 19	18	Dense, dark brown (10YR 4/3) well graded, coarsening sand, some silt and pebbles (.5 in.), saturated	SW	N/A		H <sub>2</sub> O = 1.1 ppm α = 0 cpm β = 60-80 cpm
81								
82								
83								
84								Blow SANDS
85	32728 0937 6-14	10 25 33	14	very dense, grayish brown (10YR 5/2) well graded, coarsening sand, some silt some pebbles and gravel (to .75 in.) - saturated	SW	N/A		H <sub>2</sub> O = 0.6 ppm α = 0 cpm β = 40-60 cpm
86								
87								
88								
89								Blow SANDS
90								
91	32729 1037 6-14	18 25 36	10	very dense, dark grayish brown (10YR 4/2) silty, fine grained sand, trace pebbles and gravel (to .5 in) saturated	SM	N/A		H <sub>2</sub> O = 0.4 ppm α = 0 β = 80-100 cpm
92								
93								
94								Blow SANDS
95								

**NOTES**

Drilling Contractor: PENNY-DRILL CO.  
 Drilling Equipment: BUCTAUS ERIE  
 Driller: D. NEWMAN  
 Ass't: B. JOHNSON

**BACKGROUND**

H<sub>2</sub>O = 0.4 - 2.0 ppm (MOISTURE)  
 α = 0 cpm  
 β = 40-100 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS
BOHRING NUMBER: 3385	COORDINATES:
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: M. Swanson	Depth Date/Time
DRILLING METHODS: Cable Tool	DATE STARTED: 6-5-90
	DATE COMPLETED: 7-1-90
	PAGE 4 OF 8

DEPTH (FT)	SAMITE TYPE & NO	BLOWS ON SAMPLER PER 10 IN.	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED COMPRESSIBILITY (15%)	WELL CONSTRUCTION	REMARKS
105	32730	16		very dense, brown to grayish brown <sup>well graded</sup> (10YR 4/3 - 5/2) sand some silt, gravel, pebbles and limestone cobbles (to 1 in.) saturated	SW	N/A		H <sub>nc</sub> = 0.4 ppm α = 0 cpm P <sub>γ</sub> = 40-60 cpm
106	1334 6-14	25 28	14					
107								
108								
109				DENSE, GRAYISH BROWN (10YR 5/2) POORLY GRADED FINE SAND, SOME SILT, PEBBLES TO .20 IN.; SATURATED	SP	N/A		
110	32731	20		110.5 MEDIUM DENSE, DARK GRAYISH BROWN (10YR 4/2); SANDY SILT; FINE-GRAINED SAND WITH PEBBLES TO .25 IN., SATURATED	SM	(<.25		H <sub>nc</sub> = 0.4 ppm α = 0 cpm P <sub>γ</sub> = 80-100 cpm
111	1552 6-14	31 27	13					
112								
113								BLOW SANDS
114								
115	32732	7		DENSE, DARK GRAY (10YR 4/1) WELL GRADED SANDY GRAVEL (COBBLES TO 1.0 IN.) SOME SILT, SATURATED	GW	N/A		H <sub>nc</sub> = 0.4 ppm α = 0 cpm P <sub>γ</sub> = 80-90 cpm
116	0417 6-15-90	18 19	8					
117								
118								BLOW SANDS
119								
120								

NOTES

Drilling Contractor: PENT DRILL CO.  
 Drilling Equipment: BUYROS EAVE  
 Driller: D. NEUMAN  
ASST. B. JOHNSON

BACKGROUND

H<sub>nc</sub> = 0.2 - 0.6 ppm  
 α = 0 cpm  
 P<sub>γ</sub> = 40 - 100 cpm

**VISUAL CLASSIFICATION OF SOILS**

**1112**

PROJECT NUMBER: 602-32.1	PROJECT NAME: FMPC RI/FS
BOHNING NUMBER: 3385	COORDINATES:
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: M. SWANSON	Depth Date/Time
DRILLING METHODS: CABLE TOOLS	DATE STARTED: 6-5-90
	DATE COMPLETED: 7-1-90
	PAGE 5 OF 8

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER (6 IN)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	WELL CONSTRUCTION	REMARKS
120	32733 1111 6-15	7 12 16	6	VERY SOFT, DARK GRAY (2.57 4/10) - VERY FINE SANDY SILT - TRACE OF SUBROUNDED PEBBLES @ 120.0 FT; SATURATED	ML	< 0.25		H <sub>nu</sub> = 0.3 ppm L = 0 cpm P <sub>y</sub> = 50-60 cpm
121								
122								
123								
124								
125	32734 1400 6-15	10 12 13	10	SOFT, DARK GRAY (2.57 4/10) SAND; SILT MIXTURE (X 2:3) FINE GRAINED, POORLY SORTED SAND; SATURATED	SM	0.35		H <sub>nu</sub> = 0.2 ppm L = 0 cpm P <sub>y</sub> = 40-60 cpm
126								
127								
128								BLOW SANDS
129								
130	32735 1532 6-15	10 29 30	12	VERY DENSE, DARK GRAY (10.78 4/10) SILTY GRAVEL, SOME SAND; LIMESTONE COBBLE FRAGMENTS, SURROUNDED, SATURATED.	GM	N/A		H <sub>nu</sub> = 0.2 ppm L = 0 cpm P <sub>y</sub> = 40-60 cpm
131								
132								
133								
134								
135								

**NOTES**

Drilling Contractor: DEAN DRILL CO.  
 Drilling Equipment: BUCYRUS ERIE  
 Driller: DAUBMAN  
 ASST.: B. JOHANSON

**BACKGROUND**

H<sub>nu</sub> = 0.2 ppm  
 L = 0 cpm  
 P<sub>y</sub> = 40-100 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602 32.1</u>	PROJECT NAME: <u>FMPC RI/FS</u>
BORING NUMBER: <u>3385</u>	COORDINATES: _____
ELEVATION: _____	GWL: <u>Deem</u> Date/Time: _____
ENGINEER/GEOLOGIST: <u>M. SWANSON</u>	Date/Time: _____
DRILLING METHODS: <u>CABLE TOOLS</u>	DATE STARTED: <u>6-5-90</u>
	DATE COMPLETED: <u>7-1-90</u>
	PAGE <u>6</u> OF <u>8</u>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER (6 IN)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CLINCHING (IN)	WELL CONSTRUCTION	REMARKS
135	37736	42		VERY DENSE, OLIVE GRAY (SY SIZ) POORLY GRADED FINE SAND, SOME SILT, SATURATED	SP	N/A		H <sub>u</sub> = 0.4 ppm α = 0 ppm β <sub>γ</sub> = 40-80 cm
136	0747 6-16	50+ 410	10					
135.5				VERY DENSE, OLIVE GRAY (SY SIZ) SILTY GRAVEL; TRAIL OF SAND; SATURATED	GM	MA		
136.5				BOTTOM OF BORING @ 136.5 FT. SAMPLED TO 136.5 FT.				

**NOTES**

Drilling Contractor: RENT-DRILL CO  
 Drilling Equipment: ROCTRUS GRIE  
 Driller: D. NEWMAN  
ASST.: B. JOHNSON

BACKGROUND  
 H<sub>u</sub> = 0.4 ppm  
 α = 0 ppm  
 β<sub>γ</sub> = 40-80 cm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS	DATE: 6-28-90
BORING NUMBER: 3385 (REDRILL)	COORDINATES:	
ELEVATION:	GWL Depth	Date/Time
ENGINEER/GEOLOGIST: M. Swanson	Depth	Date/Time
DRILLING METHODS: Cable Tool		PAGE 7 OF 8

DEPTH (FT.)	SAMPLE TYPE & NO	BLOWSON SAMPLING (6 in)	RECOVERY (in)	DESCRIPTION	USCS SYMBOL	MEASURED COMPRESSIBILITY (%)	WELL CONSTRUCTION	REMARKS
95	32788	15		Dense, Dark Gray (10YR 4/1); Well graded Fine silty sand; saturated	SM	N/A		H <sub>w</sub> = 0.0ppm α = 0cpm β <sub>g</sub> = 40-140cpm
96	0842	23	10					
	6-28-90	25						
97								
98								
99								
100	32739	11		Medium Dense, Dark Grayish Brown (10YR 4/2) Well graded Gravelly Sand, Some Silt and Pebbles (to .20 in); Subangular; saturated	SW	N/A		H <sub>w</sub> = 0.0ppm α = 0cpm β <sub>g</sub> = 20-100cpm
101	0924	14	12					
	6-28	9						
102								
103								
104								
105	32740	19		Very Dense, Yellowish Brown (10YR 5/4) Well Graded Coarsening Sand, Some Silt and Pebbles and Gravel (to .75 in); saturated	SW	N/A		H <sub>w</sub> = 0.0ppm α = 0cpm β <sub>g</sub> = 40-100cpm
106	1049	25	10					
	6-28	31						
107								
108								
109								
110								

NOTES:

Drilling Contractor: PENNY DRILL CO

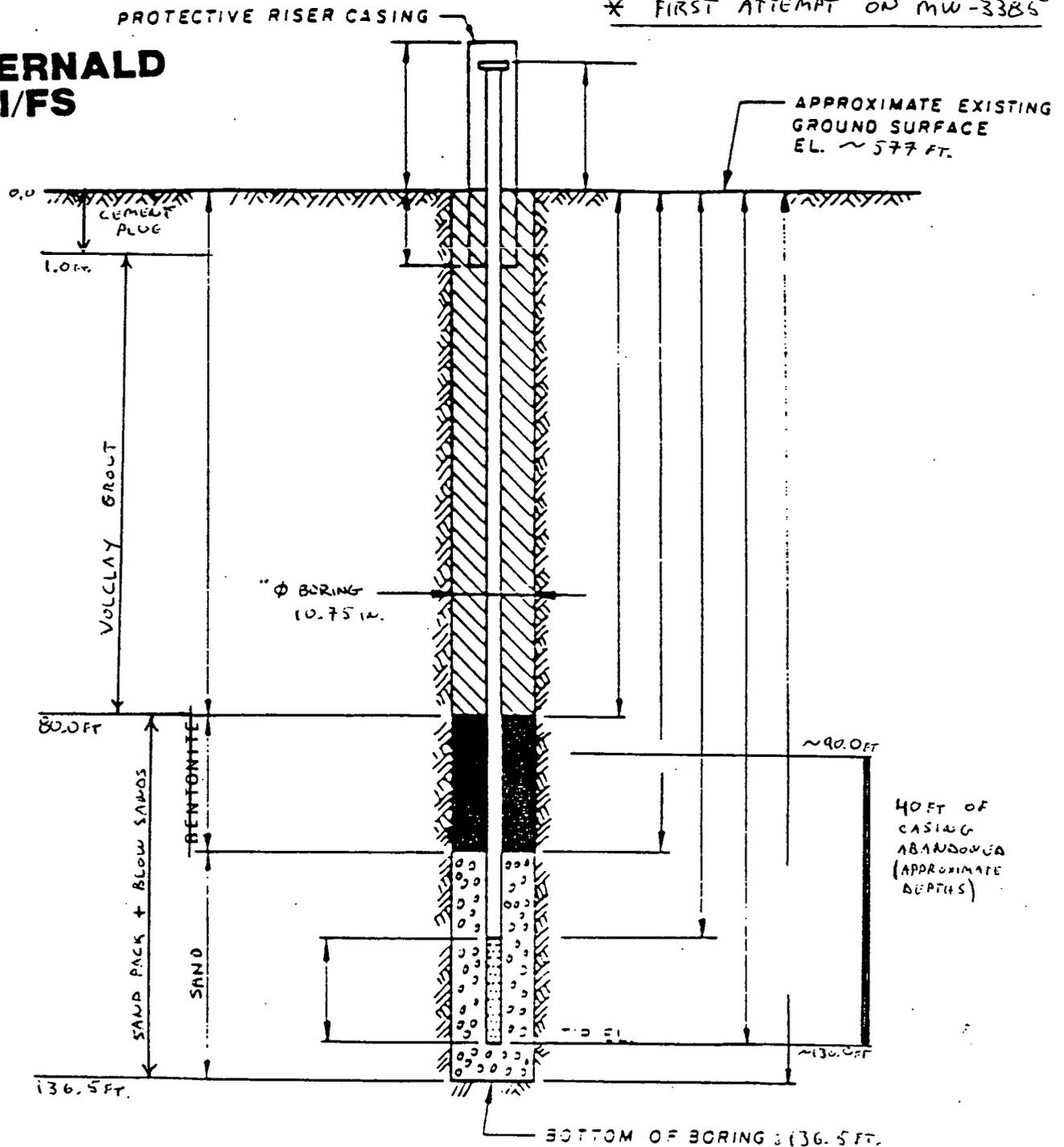
Drilling Equipment: BOCYRUS ERIE

Driller: D. NEWMAN

Asst.: B. JOHNSON

\* FIRST ATTEMPT ON MW-3385

# FERNALD RI/FS



DRAWING NUMBER
CHECKED BY
APPROVED BY
DRAWN BY

### NOTES:

1. RISER PIPE IS IN 10 SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN IS IN 1.0 PIPE CONTINUOUS SLOT SCREEN (0.0 O IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

MATERIALS USED DURING FIRST ATTEMPT:

- 10 - 80 LB. BAGS OF 10/20 SAND
- 15 - 50 LB. BAGS OF VOLCLAY GROUT
- 3 - 5 GAL. BUCKETS OF BENTONITE PELLETS
- 800 GALLONS OF WATER (DRILLING/GROUTING)
- 1 BAG OF CEMENT MIX

NO MONITOR WELL INSTALLED ON FIRST ATTEMPT DUE TO FACT THAT CASING BROKE AND WAS ABANDONED IN HOLE AT APPROXIMATELY 90 TO 130 FT. BELOW GROUND SURFACE.

INSTALLATION DETAILS MONITORING WELL 3385 (1<sup>ST</sup> ATTEMPT)

PREPARED FOR FERNALD RI/FS

# FERNALD RI/FS

# 1112

## PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. M. SWANSON DATE 6-19-90  
 PROJECT NO. 602 3.2.1 CHECKED BY E. TROTTNER DATE 7-13-90  
 BORING NO. 3385  
 PIEZOMETER NO. 3385 DATE OF INSTALLATION 7-1-90

### BOREHOLE DRILLING

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID (S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0 FT</u> TO _____ FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE (S) USED: SIZE <u>10.0 ID</u> FROM <u>0 FT</u> TO <u>135.0 FT</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

### PIEZOMETER DESCRIPTION

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 in.</u> I.D. <u>4 in.</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in.</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u>
TOTAL PERFORATED AREA <u>10 FT</u>	

### PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED, LOCKING</u>
PROTECTIVE PIPE O.D. <u>10.75 in.</u>	<u>LID COVER WITH PADLOCK</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	+ 2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	- 2.5			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0	BOTTOM 110.0	TOP	BOTTOM
BENTONITE <i>NONE USED</i>	TOP N/A	BOTTOM N/A	TOP	BOTTOM
SAND	TOP 110.0	BOTTOM 126.7	TOP	BOTTOM
GRAVEL <i>NONE USED</i>	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 115.0	BOTTOM 125.0	TOP	BOTTOM
PIEZOMETER TIP	126.7 FT			
BOTTOM OF BOREHOLE	126.7 FT			
GWL AFTER INSTALLATION	53.8 FT ON 7-2-90			

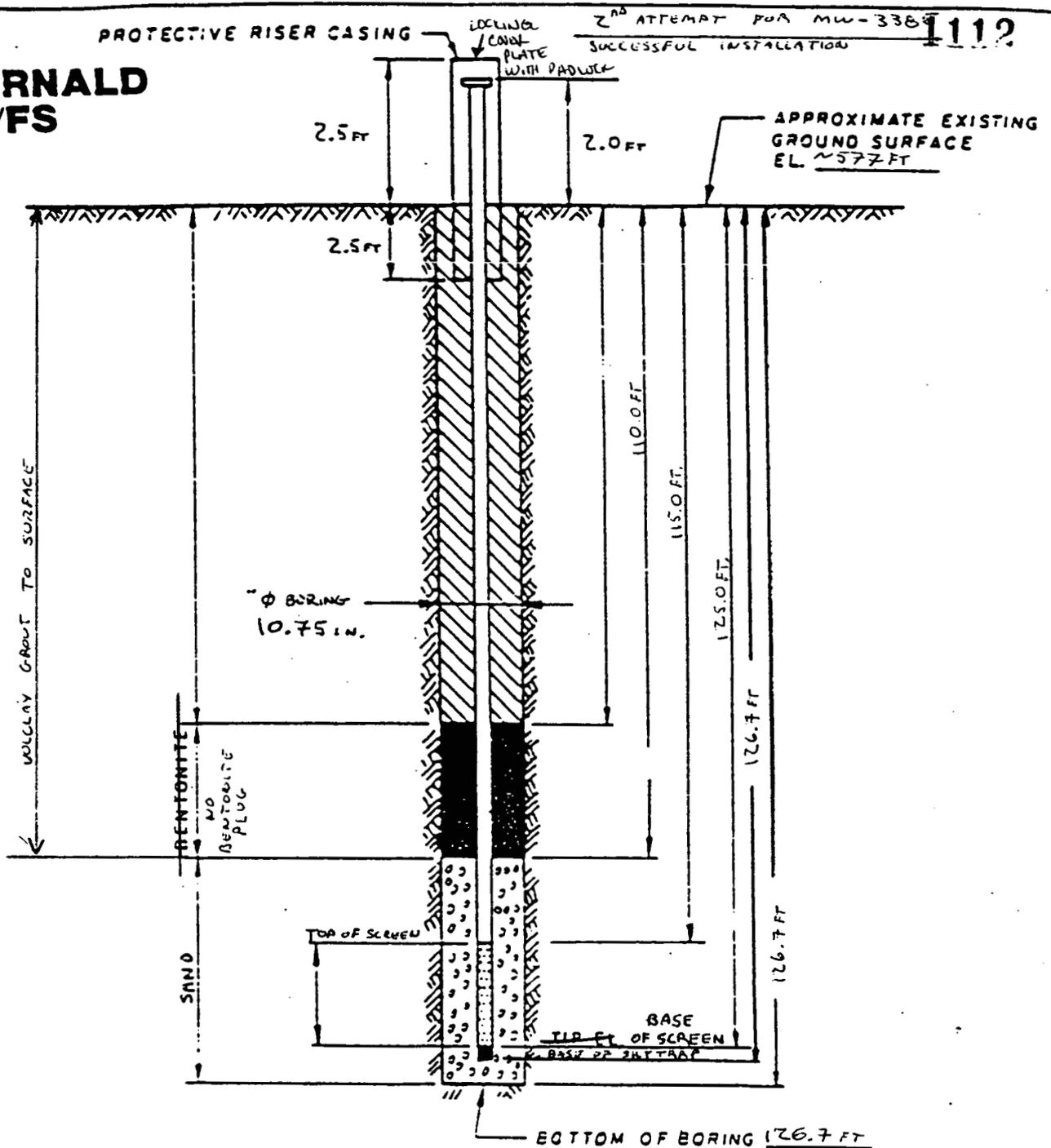
WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

# 53

REMARKS NO BENTONITE PLUG. 3 BUCKETS OF BENTONITE ADDED AROUND PROTECTIVE CASING.

# FERNALD RI/FS

PROTECTIVE RISER CASING  
 2<sup>ND</sup> ATTEMPT FOR MW-3385  
 SUCCESSFUL INSTALLATION **1112**



DRAWING NUMBER	
CHECKED BY	M.H.D.
APPROVED BY	7-2-90
DRAWN BY	

**NOTES:**

1. RISER PIPE 1.54.0 IN I.D. SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN 1.54.0 IN I.D. SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED. (WITH WELDED SILT TRAP)
4. ELEVATION OF WATER LEVEL 54.0 FT
5. WATER LEVEL READING ON 7-1-90

INSTALLATION DETAILS  
 MONITORING WELL #3385

PREPARED FOR  
 FERNALD RI/FS

**MATERIALS USED DURING WELL INSTALLATION**

- 15 80 LB. BAGS OF 10/20 SAND
- 16 50 LB. BAGS OF VOLCLAY GROUT
- 3 5 GAL. BUCKETS OF BENTONITE PELLETS

1600 GALLONS OF WATER USED DURING GROUTING AND DRILLING PROCEDURES ← INCLUDES WATER FROM 1<sup>ST</sup> ATTEMPT.

SS PIPE SECTIONS: 11 - 10' SECS; 1 - 5' SEC; 1 - 2' SEC; 1 - 10' SCREEN w/ 1.7 FT WELDED SILT TRAP

Date	6/29/90			
Initial	SL			
Field Check		1st Key in	2nd Key in	Hard Cap Verification

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>FMPC RI/FS</u>		
BORING NUMBER: <u>4108</u>	COORDINATES	DATE: <u>6-29-90</u>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <u>6-29-90</u>
ENGINEER/GEOLOGIST: <u>GARMAN/LEAR</u>	Depth	Date/Time	DATE COMPLETED: <u>7-13-90</u>
DRILLING METHODS: <u>CABLE TOOL</u>	PAGE <u>1</u> OF <u>5</u>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLE PER (G/M)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (L.S.)	NA WELL CONSTRUCTION	REMARKS
0				SEE VISUAL CLASSIFICATION LOGS FOR MONITOR WELLS 3108 AND 2108 FOR SOIL DESCRIPTION AND CLASSIFICATION.				
5								
10								
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								
75								
80								
85								
90								
95								

NOTES.

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
ASST. CHRIS COULTER

BACKGROUND:  
 HNU = 0 ppm  
 α = 0 cpm  
 γB = 100-160 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>FAPC RI/FS</u>
BORING NUMBER: <u>410B</u>	COORDINATES
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: <u>CARMAN/LEAR</u>	DATE STARTED: <u>6-29-90</u>
DRILLING METHODS: <u>CABLE TOOL</u>	DATE COMPLETED: <u>7-13-90</u>
	PAGE <u>2</u> OF <u>5</u>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ES)	NA WELL CONSTRUCTION	REMARKS
95				WPP 1-1-90				
96	32742		ms 7.1	HARD, DARK GRAY (10YA 4/1), CLAY, SOME ORGANIC MATERIAL, MOIST  ⊗ PUSHED SHELLEY TUBE FROM 96.1 TO 98.1 FT. 2.0 FT PENETRATION.  0.65 FT OF BLUE CLAY RECOVERED, SAMPLE # <u>32742</u>	CL	2.5		H <sub>NU</sub> = 0.1 ppm
97	1215	N/A	7.8					
98	7-1-90							β = 50-140 cpm
99								
100	32743	11		HARD, DARK GRAY (10YA 4/1), CLAY, TRACE OF SILT, LOW TO MEDIUM PLASTICITY, MOIST	CL	2.5		H <sub>NU</sub> = 0.1 ppm
101	1310	27	18					
102	7-1-90	21						β = 60-110 cpm
103								
104								
105	32744	14		FIAM, DARK GRAY (2.5Y 4/0), CLAY, MEDIUM TO HIGH PLASTICITY, MOIST TO WET	CH	1.75		H <sub>NU</sub> = 0.1 ppm
106	0908	26	16					
107	7-2-90	33						β = 40-80 cpm
108								
109								
110								

Shelley Tube pushed for blue clay.

NOTES:  
 Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLO JE 43  
 Driller: CRAIG COULTER  
 ASST. CERIS COULTER

BACKGROUND:  
 H<sub>NU</sub> = 0.1 ppm  
 α = 0 cpm  
 β = 20-140 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <b>602 J.2.1</b>	PROJECT NAME: <b>FMPC R/FS</b>
BORING NUMBER: <b>4108</b>	COORDINATES:
ELEVATION:	GWL: Depth Date/Time
ENGINEER/GEOLOGIST: <b>M. SWANSON</b>	Depth Date/Time
DRILLING METHODS: <b>CABLE TOOL</b>	PAGE <b>3</b> OF <b>5</b>

DEPTH (FT)	SAMPLE TYPE & NO	INCHES ON SAMPLE PER (6 IN.)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (IS:)	WELL CONSTRUCTION	REMARKS
110	32745	14		FIAM, DARK GRAY (2.5Y 4/0), CLAY. SOME SILT, TRACE OF SAND AND GRAVEL. MEDIUM TO HIGH PLASTICITY, MOIST TO WET	CH	1.50		H <sub>2</sub> O = 0.1 ppm α = 0 cpm βγ = 60-120 cpm
111	1014	22						
	7-2-90	24						
112								
113								
114								
115	32746	50		VERY DENSE, GRAY (5Y 5/1), CLAYEY GRAVEL; LIMESTONE COBBLES, SATURATED	GC	MA		H <sub>2</sub> O = 0.1 ppm α = 0 cpm βγ = 100-140 cpm
116	0910	5 IN	5					
	7-10-90							
117	32747	100		VERY DENSE, GRAY (5Y 5/1), LIMESTONE GRAVEL, COBBLES, LARGE FRAGMENT. ASSUMED BEORDBCH	GP	VIA		H <sub>2</sub> O = 0.1 ppm α = 0 cpm βγ = 60-120 cpm
118	1113	2 IN	2					
	7-10							
119				BOTTOM OF BORING @ 117.0 FT SAMPLED TO 117.0 FT.				
120								H <sub>2</sub> O = α = βγ =
121								
122								
123								
124								
125								

**NOTES**  
 Drilling Contractor: RENO DRILL CO.  
 Drilling Equipment: BUYROS URLE  
 Driller: D. NEWMAN  
ASST. B. JOHNSON

**BACKGROUND**  
 H<sub>2</sub>O = 0.0-0.2 ppm  
 α = 0 cpm  
 βγ = 60-140 cpm

# FERNALD RI/FS

1112

## PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. M. SWANSON DATE 6-29-90  
 PROJECT NO. 602 3.2.1 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
 BORING NO. 4108  
 PIEZOMETER NO. 4108 DATE OF INSTALLATION 7/13/90

### BOREHOLE DRILLING

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID(S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0 FT</u> TO <u>117</u> FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE (S) USED: SIZE <u>10.125 ID</u> FROM <u>0 FT</u> TO <u>117</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

### PIEZOMETER DESCRIPTION

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 IN ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 IN.</u> I.D. <u>4 IN.</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 IN.</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u> <u>WITH PADLOCK</u>
TOTAL PERFORATED AREA <u>10 FT</u>	

### PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED, LOCKING</u>
PROTECTIVE PIPE O.D. <u>10.75 IN.</u>	<u>LID COVER</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	+ 2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	- 2.5			
BOREHOLE FILL MATERIALS: VULCAN GROUT/SLURRY BENTONITE SAND 10/20 GRAVEL	TOP <u>0</u>	BOTTOM <u>95 FT</u>	TOP	BOTTOM
	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
	TOP <u>95 FT</u>	BOTTOM <u>117 FT</u>	TOP	BOTTOM
	TOP <u>N/A</u>	BOTTOM <u>N/A</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>104 FT</u>	BOTTOM <u>114 FT</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>116 FT</u>			
BOTTOM OF BOREHOLE	<u>117 FT</u>			
GWL AFTER INSTALLATION	<u>23.75 FT ON 7-14-90</u>			

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

REMARKS 3 BUCKETS OF BENTONITE PELLETS ADDED AROUND PROTECTIVE CASING

**VISUAL CLASSIFICATION OF SOILS**

1112

PROJECT NUMBER: 303317 (602.3.2.1)	PROJECT NAME: Fernald		
BORING NUMBER: B-2389	COORDINATES:	DATE: 7-2-90	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 6-30-90
ENGINEER/GEOLOGIST: B. Nies	Depth	Date/Time	DATE COMPLETED: 7-15-90
DRILLING METHODS: Cable foot			PAGE 3 OF 7

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6)	RECOVERY (inches)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	NA WELL CONSTRUCTION	REMARKS
30.0	32851 7-2 0850	7 13 15	18	Medium dense (2.58, 5/16) light olive brown sand, trace silt and c-sand, moist.	SP	NA	NA	H <sub>uv</sub> = 0ppm α = 0cpm β, γ = 80cpm
31.5								
35	32852 7-2 0945	15 15 12	18	Medium dense (2.58, 4/16) olive brown M-sand, trace silt, trace c-sand, and trace gravel, moist.	SP	N/A		H <sub>uv</sub> = 0ppm α = 0cpm β, γ = 80cpm
36.5								
40	32853 7-2 1010	15 20 30	18	Dense (2.58, 4/12) olive brown M-sand, trace silt, grading to M-sand, trace f-gravel, trace c-sand, moist.	SP	N/A		H <sub>uv</sub> = 0ppm α = 0cpm β, γ = 120cpm
41.5								
45								

NOTES:

Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 72 speed star  
 Driller: Joe Barile  
Gary Krepps

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>Fernald</u>	
BORING NUMBER: <u>B-2389</u>	COORDINATES:	DATE: <u>7-2-90</u>
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: <u>6-30-90</u>
ENGINEER/GEOLOGIST: <u>B. Nies / M. GARNAN</u>	Depth      Date/Time	DATE COMPLETED: <u>7-15-90</u>
DRILLING METHODS: <u>Cable Tool</u>	PAGE <u>4</u> OF <u>7</u>	

7-2-90  
7-11-90

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6")	RECOVERY (inches)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
45	32854 7-2	33 50/4	7	very dense (2.54, 5/16) light olive brown gravelly sand, moist.	SW	NA		H <sub>2</sub> O = 0 ppm α = 0 cpm β, γ = 80 cpm
46.5	1100							
50	32855 7-11	50/4	4	very dense (2.54, 5/16) grayish brown silty sand (fine to medium grained), trace gravel, moist	SM	NA		H <sub>2</sub> O = 0 ppm α = 0 cpm β, γ = 100 cpm
51.5	0910							
55	32856 7-11	50/5	5	very dense (40 PR, 5/16) grayish brown well graded sand, trace silt, trace gravel, wet.	SW	NA		H <sub>2</sub> O = 0 ppm α = 0 cpm β, γ = 120 cpm
56.5	1430							

NOTES:

Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 7L Speedstar  
 Driller: Joe Barite  
GARY KREPPS

Background:

H<sub>2</sub>O = 0 ppm  
 α = 0 cpm  
 β, γ = 100-200 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.32.1</u>	PROJECT NAME: <u>Fernald</u>	
BORING NUMBER: <u>2389</u>	COORDINATES:	DATE: <u>7-11-90</u>
ELEVATION:	GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: <u>B. Nies / M. GARNAN</u>	Depth	Date/Time
DRILLING METHODS: <u>CABLE TOOLS.</u>	DATE COMPLETED: <u>7-15-90</u>	
		PAGE <u>5</u> OF <u>7</u>

DEPTH (ft)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6" )	RECOVERY (inches)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	WELL CONSTRUCTION	REMARKS
60	32857	20	13	Dense (104R, 411) dark gray well graded sand, trace silt, trace gravel, moist wet.	SW	NA	NA	H <sub>2</sub> O = 0 ppm α = 0 cpm B <sub>1</sub> γ = 160 cpm
U.S.	7-11	20						
	1510	27						
7-11-40 7-12-40	32858	50/5	5	SAA	SW	NA	NA	H <sub>2</sub> O = 0 ppm α = 0 cpm B <sub>1</sub> γ = <100 cpm
66.5	7-12							
	1040							
70	32859	50/4	3	SAA	SW	NA	NA	H <sub>2</sub> O = 0 ppm α = 0 cpm B <sub>1</sub> γ = <100 cpm
71.5	7-12							
	1100							
				T.D. 71.5 ft. BOTTOM OF BORING @ 71.5 FT. SAMPLING ENDED @ 71.5 FT.				

NOTES:

Drilling Contractor Pennsylvania Drilling  
 Drilling Equipment 72 Speed Star  
 Driller: Joe Barite  
GARY KREPPS

Background

H<sub>2</sub>O = 0 ppm  
 α = 0 cpm  
 B<sub>1</sub>γ = 100-200 cpm

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME Fernald FIELD ENG./GEO. B. Nies DATE 7-15/14-90  
 PROJECT NO. 602 32.1 CHECKED BY E. Trullinger DATE 7-28-90  
 BORING NO. 2389  
 PIEZOMETER NO. 2389 DATE OF INSTALLATION 7-13/14-90

**BOREHOLE DRILLING**

DRILLING METHOD <u>Cable tool</u>	TYPE OF BIT <u>Cable tool (Hammer)</u>
DRILLING FLUID(S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0</u> TO <u>55.0ft</u> FLUID <u>—</u> FROM <u>—</u> TO <u>—</u>	CASING SIZE(S) USED: SIZE <u>10. inch</u> FROM <u>0</u> TO <u>70.0ft</u> SIZE <u>—</u> FROM <u>—</u> TO <u>—</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring well</u>	RISER PIPE MATERIAL <u>Stainless steel</u>
DIAMETER OF PERFORATED SECTION <u>4 inch</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 inch</u> I.D. <u>4.0 inch</u>
PERFORATION TYPE: SLOTS <input checked="" type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>19, 10, 2 ft</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010</u>	JOINING METHOD <u>threaded, flush-joint</u>
TOTAL PERFORATED AREA <u>15.0 ft</u>	<u>WITH SCREW ENDS.</u>

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0 ft</u>	OTHER PROTECTION <u>Locking <del>top</del> cap</u>
PROTECTIVE PIPE O.D. <u>10.5 inches</u>	<u>WITH PADLOCK</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION ( )	
TOP OF RISER PIPE	2.5 ft			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.3 ft			
BOREHOLE FILL MATERIALS: GROUT/SLURRY <u>ben brite pellets</u> BENTONITE <u>(0.0-2.0)</u> SAND <u>10/20</u> GRAVEL <u>none used</u>	TOP <u>0.0 ft</u>	BOTTOM <u>42.0ft</u>	TCP	BOTTOM
	TOP <u>42.0ft</u>	BOTTOM <u>47.0ft</u>	TOP	BOTTOM
	TOP <u>47.0ft</u>	BOTTOM <u>69.0ft</u>	TOP	BOTTOM
	TOP <u>n/a</u>	BOTTOM <u>n/a</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>52.0ft</u>	BOTTOM <u>67.0'</u>	TOP	BOTTOM
PIEZOMETER TIP	69.0 ft			
BOTTOM OF BOREHOLE	71.5 ft			
GWL AFTER INSTALLATION	58.57' on 7-16-90			

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

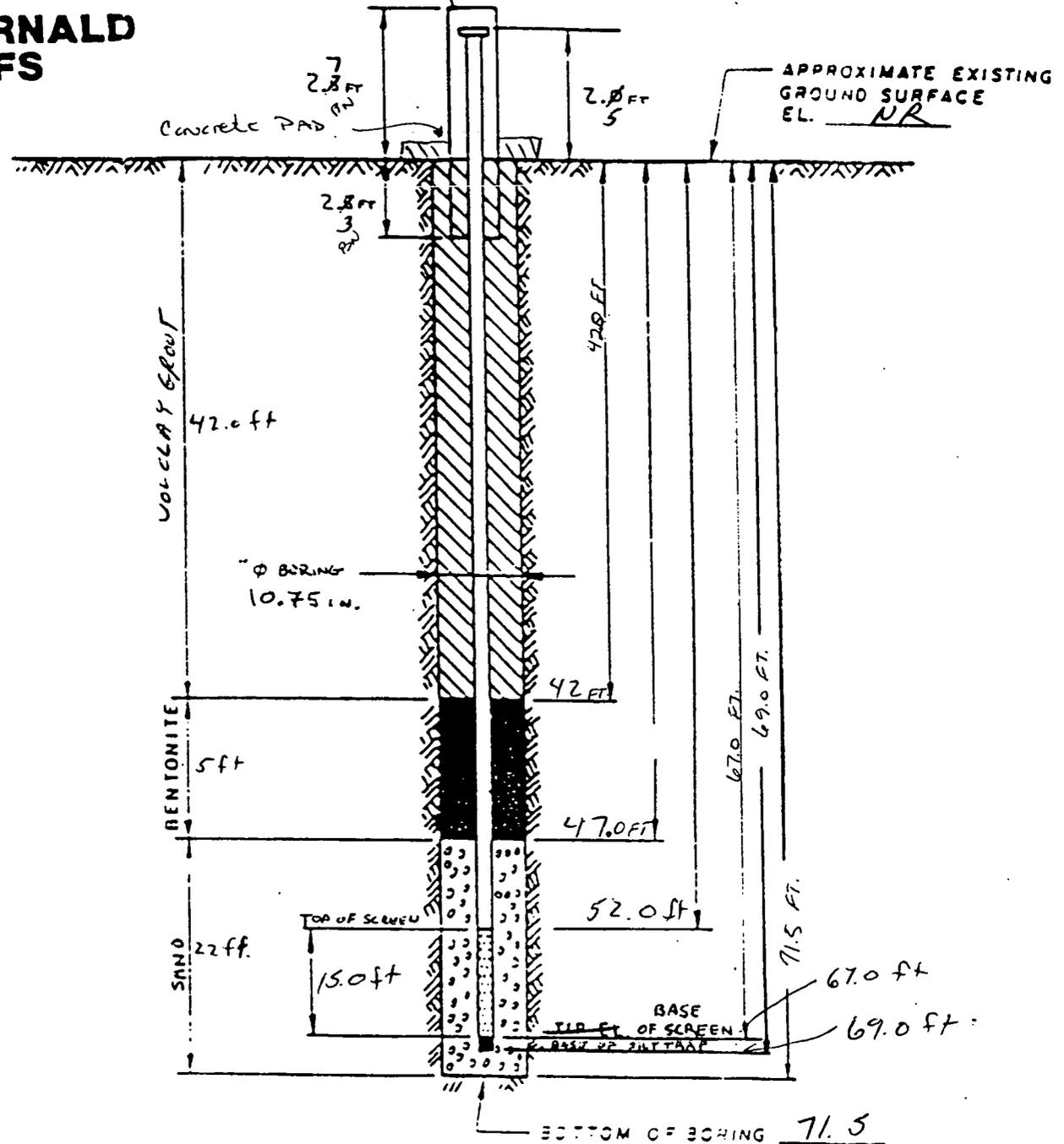
REMARKS water was at 25.0' on Thursday 7-13 - not sure where it was coming from - water was encountered at 55.0' during drilling

water level on 7-16-90 was 58.57' from TOC

602.3.2.1

**FERNALD  
RI/FS**

PROTECTIVE RISER CASING



DRAWING NUMBER  
 CHECKED BY  
 APPROVED BY  
 DRAWN BY

**NOTES:**

1. RISER PIPE 1.54.0 IN 1.0 SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN 1.54.0 IN 1.0 SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED. (WITH WELDED SILT TRAP)
4. ELEVATION OF WATER LEVEL 58.57 ft from TOL
5. WATER LEVEL READING ON 7-16-90

INSTALLATION DETAILS  
 MONITORING WELL # 2389

PREPARED FOR  
 FERNALD RI/FS

**MATERIALS USED DURING WELL INSTALLATION:**

- 18 80 LB. BAGS OF 10/20 SAND
- 11 50 LB. BAGS OF Vol-CLAY GROUT
- 12 5 GAL. BUCKETS OF BENTONITE PELLETS
- 800 GALLONS OF WATER USED DURING GROUTING AND DRILLING PROCEDURES
- SS PIPE SECTIONS: 15 ft screen w/ 2 ft sump, 5-10 ft & 2-2 ft

Date	7/19/90				
Initial	E.T.				
Field Check		1st Log In	2nd Key In	Hard Copy Verification	

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 3396	COORDINATES:	DATE: 7-16-90
ELEVATION:	GWL: Depth 5.2 FT Date/Time 7/24/90 @ 1000	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth 5.5 FT Date/Time 7/19/90 @ 1200	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS	PAGE 1	OF 9

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN. I	RECOVERY (IN.)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	32900 0942 7-16-90	3 2	8	VERY SOFT, DARK GRAYISH BROWN (10YR 4/2), CLAYEY SILT, TRACE OF SAND AND ORGANICS IN 0.0 TO 0.2 FT. INTERVAL, MOIST	OH	N/A	H <sub>nu</sub> = 0.30 ppm α = 0 cam P <sub>γ</sub> = 30 cam
2	32901 0947 7-16	4 4	8	VERY SOFT, DARK YELLOWISH BROWN (10YR 4/6) SANDY SILT, SOME CLAY, TRACE OF GRAVEL (SUBANGULAR), MOIST	SM	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 30 cam
3	32902 0451 7-16	4 6	10	VERY LOOSE, DARK YELLOWISH BROWN (10YR 4/6), SANDY GRAVEL (ANGULAR), DRY	GP	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 30-50 cam
4	32903 0453 7-16	3 5	7	LOOSE, YELLOWISH BROWN (10YR 5/6), POORLY GRADED FINE SAND, DRY TO MOIST	SP	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 40 cam
5	32904 0454 7-16	6 6	8	MEDIUM DENSE, YELLOWISH BROWN (10YR 5/4), GRAVELLY SAND (SUBANGULAR), SOME SILT, MOIST TO WET	SM	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 40 cam
6	32905 1007 7-16	6 12	6	MEDIUM DENSE, YELLOWISH BROWN (10YR 5/4), GRAVEL-SAND-SILT MIXTURE (SUBANGULAR) TO SUBROUND, WET	GM	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 30-40 cam
7	32906 1015 7-16	18 10	9	MEDIUM DENSE, LIGHT OLIVE BROWN (2.5Y 5/4), SANDY GRAVEL, SOME SILT, LIMESTONE COBBLE FRAGMENT, COARSE-POORLY GRADED SAND, SATURATED	GM	N/A	H <sub>nu</sub> = 0.20 ppm α = 0 cam P <sub>γ</sub> = 40 cam
8	32907 1340 7-16	8 9	12	MEDIUM DENSE, OLIVE GRAY (2.5Y 4/4), POORLY GRADED FINE SAND, SOME SILT, SATURATED	SP	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cam P <sub>γ</sub> = 40-60 cam
9	32908 1349 7-16	7 8	10	MEDIUM DENSE, OLIVE GRAY (2.5Y 4/4), SILTY GRAVEL, SOME SAND, SATURATED	GM	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cam P <sub>γ</sub> = 60-90 cam
10				AQUIFER WILL BE SAMPLED EVERY 5.0 FT. HERE AFTER			

START OF AQUIFER  
3.0 FT  
5.3 FT

**NOTES:**

DRILLING CONTRACTOR: PELL DRILL CO.  
 DRILLING EQUIPMENT: BULYRUS ERIC  
 DRILLER: DWENMAL ASST: B. JOHNSON  
 ALL SOIL SAMPLES COLLECTED PER ASTM STANDARD PENETRATION TEST, SOIL COLORS IDENTIFIED USING MUNSELL COLOR CHARTS.

INSTRUMENT	SERIAL #	INST. #	BACKGROUND READINGS
H <sub>nu</sub>	101344	N/A	0.10-0.30 ppm
α	4	4	0 cam
P <sub>γ</sub>	7	7	20-40 cam

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMAIL RI/FS	
BORING NUMBER: 3396	COORDINATES:	DATE: 7-16-90
ELEVATION:	GWL: Depth Date/Time	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth Date/Time	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS	PAGE 2 OF 9	

DEPTH	SAMPLE TYPE & NO.	BLOWSON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
15							
16							
17							
18							
19							
20	32904	3		VERY LOOSE, DARK GRAYISH BROWN (2.5Y 4/2), POORLY GRADED COARSE SILTY SAND, SOME SUBROUNDED PEBBLES, WET	SP	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm PY = 30 cpm
20.4	1541	6	12	LOOSE, LIGHT OLIVE BROWN (2.5Y 5/4), SILTY SAND, SOME CLAY, SATURATED	SM	N/A	
20.7	7-16	6		LOOSE, VERY DARK GRAYISH BROWN (2.5Y 3/2), WELL GRADED SANDY GRAVEL, TRACE OF LIMESTONE COBBLES, WET	GW	N/A	
21							
22							
23							
24							
25	32910	18		DENSE, DARK GRAY (10YR 4/1), WELL GRADED GRAVEL-SAND MIXTURE, SOME SUBROUNDED PEBBLES, TRACE OF SILT, SATURATED	GW	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm PY = 40-70 cpm
26	1637	19	18				
26	7-16	19					
27							
28							
29							
30							

**NOTES:**

DRILLING CONTRACTOR: PENN DRILL CO.  
 DRILLING EQUIPMENT: BUCKY'S CRIE  
 DRILLERS: A. NEWMAN ASST.: B. JOHNSON

BACK GROUND

H<sub>nu</sub> = 0.10 ppm  
 α = 0 cpm  
 PY = 20-80 cpm

70

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 6023.2.1	PROJECT NAME: FMPC RI/FS		
BORING NUMBER: 3396	COORDINATES:	DATE: 7-16-90	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth	Date/Time	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS			PAGE 3 OF 9

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ISCI)	REMARKS
30	32911	20		VERY DENSE, GRAYISH BROWN (10YR 5/1), WELL GRADED GRAVELLY SAND, SOME SUBANGULAR PEBBLES, TRACE OF SILT	SW	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm β <sub>γ</sub> = 40 cpm
31	1702 7-16	29 40	16				
32							
33							
34							
35	32912	18		DENSE, DARK GRAY (10YR 4/1) SILTY COARSE SAND, SOME GRAVEL AND PEBBLES (SUBANGULAR), TRACE OF COBBLES, WET	SM	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm β <sub>γ</sub> = 40-50 cpm
36	1739 7-16	16 21	14				
37							
38							
39							
40	32913	2		LOOSE, DARK GRAY (10YR 4/1), POORLY GRADED SANDY GRAVEL, SOME SILT, ROUNDED TO SUBANGULAR PEBBLES, WET	GP	N/A	H <sub>nu</sub> = 0.15 ppm α = 0 cpm β <sub>γ</sub> = 60 cpm
41	1753 7-16	3 6	3				
42							
43							
44							
45							

**NOTES:**

DRILLING CONTRACTOR: PENN DRILL CO.  
 DRILLING EQUIPMENT: BUCYLUS GANE  
 DRILLER: D. NEUMAN ASST.: B. JOHNSON

**BACKGROUND**

H<sub>nu</sub> = 0.10-0.20 ppm  
 α = 0 cpm  
 β<sub>γ</sub> = 40-60 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 32.1	PROJECT NAME: FMPC RI/FS		
BORING NUMBER: 3396	COORDINATES:	DATE: 7-17-90	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth	Date/Time	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS	PAGE 4		OF 9

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWSON SAMPLER PER 16 (IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
45	32914	16		DENSE, DARK GRAY (10YR 4/1), WELL GRADED COARSE SAND, SOME ROUNDED PEBBLES, TRACE OF SILT, SATURATED	SW	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm P <sub>γ</sub> = 40-60 cpm
46	0849	19	18				
47	7-17-90	22					
48							
49							
50	32915	6		DENSE, DARK GRAY (7.5YR 4/0), WELL GRADED GRAVELLY SAND, SOME ROUNDED PEBBLES AND SILT, TRACE OF COBBLES, SATURATED	SW	N/A	H <sub>nu</sub> = 0.15 ppm α = 0 cpm P <sub>γ</sub> = 40-60 cpm
51	0941	13	12				
52	7-17	20					
53							
54							
55	32916	16		VERY DENSE, DARK GRAY (7.5YR 4/0), WELL GRADED COARSE GRAVELLY SAND, SOME ROUNDED PEBBLES, COBBLES, AND SILT, SATURATED	SW	N/A	H <sub>nu</sub> = 0.10 ppm α = 0 cpm P <sub>γ</sub> = 40-50 cpm
56	1052	21	14				
57	7-17	39					
58							
59							
60							

**NOTES:**

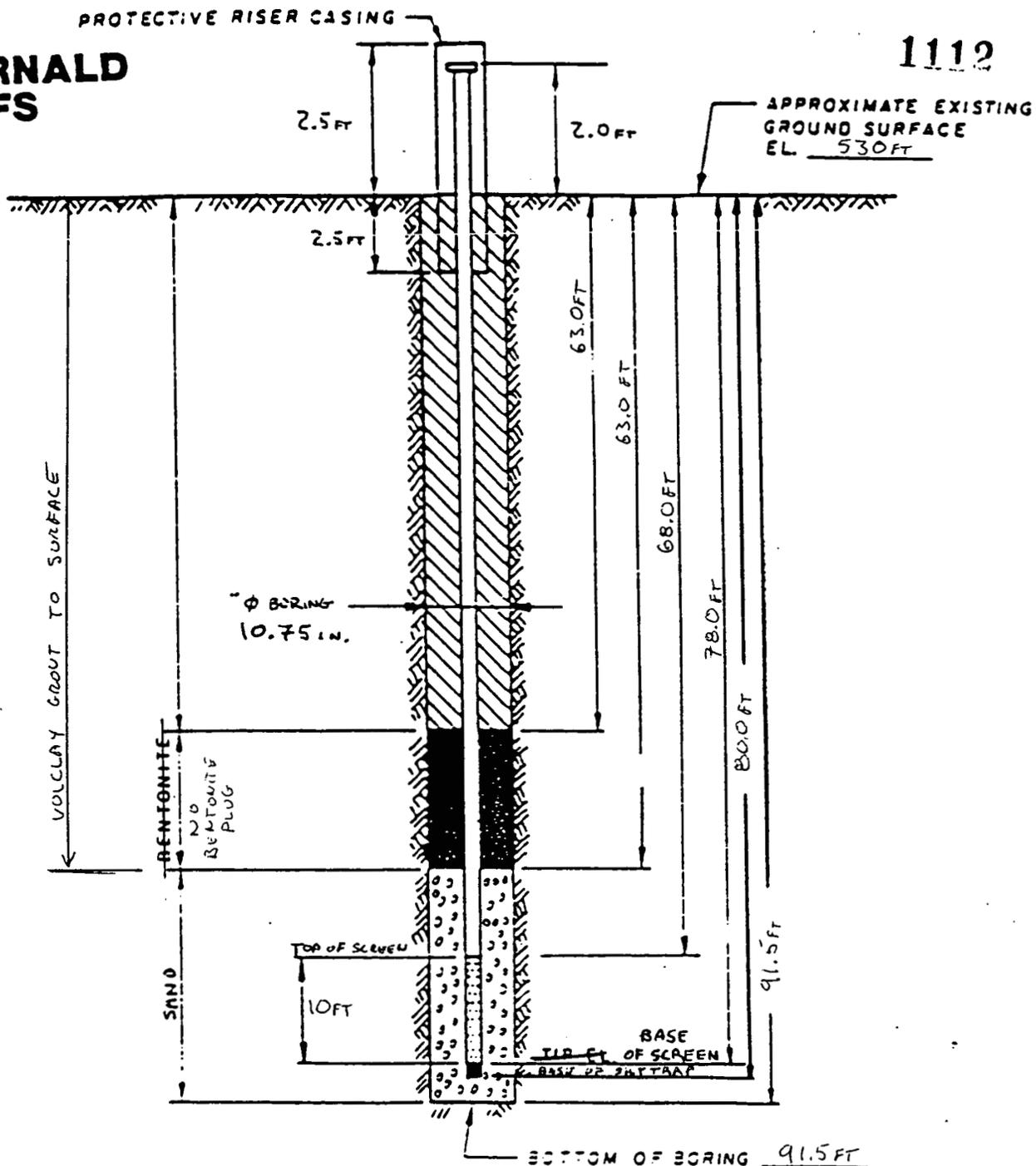
DRILLING CONTRACTOR: PENN DRILL CO.  
 DRILLING EQUIPMENT: BUCYROS GRIE  
 DEALER: D. NEWMAN ASST. C.B. JOHNSON

**BACKGROUND**

H<sub>nu</sub> = 0.2 ppm  
 α = 0 cpm  
 P<sub>γ</sub> = 40-60 cpm

# FERNALD RI/FS

1112



DRAWING NUMBER	
CHECKED BY	M.K.O.
APPROVED BY	7-19-90
DRAWN BY	

**NOTES:**

1. RISER PIPE IS 4.0 IN I.D SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN IS 4.0 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED (WITH WELDED SILTTRAP)
4. ELEVATION OF WATER LEVEL 5.5 FT
5. WATER LEVEL READING ON 7-19-90

INSTALLATION DETAILS  
MONITORING WELL #3396

PREPARED FOR  
FERNALD RI/FS

**MATERIALS USED DURING WELL INSTALLATION:**

- 23 80 LB. BAGS OF 10/20 SAND (5 FROM ORIGINAL ATTEMPT)
  - 19 50 LB. BAGS OF VOLCLAY GROUT (5 FROM ORIGINAL ATTEMPT)
  - 8 5 GAL. BUCKETS OF BENTONITE PELLETS (4 FROM ORIGINAL ATTEMPT)
  - 800 GALLONS OF WATER USED DURING GROUTING AND DRILLING PROCEDURES
- SS PIPE SECTIONS: 1-10 FT SCREEN WITH 2 FT WELDED SILTTRAP, 7-10 FT SECTIONS OF RISER PIPE

Date	7/28/90			
Initial	ET			
Field Check				
1st Key In				
2nd Key In				
Hard Copy Verification				

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>FMPC RNFS</u>	DATE: <u>7-17-90</u>
BORING NUMBER: <u>2393</u>	COORDINATES:	DATE STARTED: <u>7-17-90</u>
ELEVATION:	GWL: <u>Depth</u>	DATE COMPLETED: <u>7-24-90</u>
ENGINEER/GEOLOGIST: <u>M. GARMAN</u>	Depth	PAGE: <u>1</u> OF <u>4</u>
DRILLING METHODS: <u>CABLE TOOL</u>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN.)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (SPT)	WELL CONSTRUCTION	REMARKS
1	32876 7-17 1335	2 3 4	8	LOOSE (104R, F/3) DARK BROWN CLAYEY SILT. TRACE FINE SAND. SLIGHTLY MOIST.	ML	NA		HNU = 0 α = 0 βγ = 50 cpm
2	32871 7-17 1340	10 11 23	7	DENSE (104R, F/3) DARK BROWN CLAYEY SILT. TRACE FINE SAND. TRACE COARSE GRAVEL. LOW MOISTURE.	ML	NA		HNU = 0 α = 0 βγ = 60 cpm
3	32872 7-17 1342	40 36 27	10	VERY DENSE (104R, S/3) BROWN GRAVELLY WELL GRADED SAND SOME SILT, LOW MOISTURE.	SW	NA		HNU = 0 α = 0 βγ = 60 cpm
4	32873 7-17 1535	34 50 2M	10	VERY DENSE (104R, S/4) YELLOWISH BROWN SANDY WELL GRADED GRAVEL. SOME SILT. LOW MOISTURE.	GW	NA		HNU = 0 α = 0 βγ = 60 cpm
5								
6								
7								
8								
9								
10	32874 7-17 1645	50 50 45	11	VERY DENSE (104R, S/6) YELLOWISH BROWN SANDY WELL GRADED GRAVEL. SOME SILT. LOW MOISTURE.	GW	NA		HNU = 0 α = 0 βγ = 60 cpm
11								
12								
13								
14								
15								

END OF TRL

11

NOTES:  
 Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
 ASST. CHRIS COULTER

BACKGROUND:  
 HNU = 0  
 α = 0  
 βγ = 40 - 80 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>FMPC RIVFS</u>	DATE: <u>7-18-90</u>
BORING NUMBER:	COORDINATES:	DATE STARTED: <u>7-17-90</u>
ELEVATION:	GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: <u>M. GARMAN</u>	Depth	Date/Time
DRILLING METHODS: <u>CABLE TOOL</u>		DATE COMPLETED: <u>7-24-90</u>
		PAGE <u>2</u> OF <u>4</u>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (CS)	NA WELL CONSTRUCTION	REMARKS
15	32875	13		DENSE (104R, 5/3) BROWN COARSE GRAVEL TRACE SILT. TRACE SAND. MOIST.	GP	NA	NA	HMU = 0 α = 0 B <sub>8</sub> = 60 cpm
-16	7-18 1118	18 14	2					
-17								
-18								
-19								
-20	32876	13		DENSE (104R, 5/3) BROWN GRAVELLY WELL GRADED SAND. TRACE SILT. WET.	SW	NA	NA	HMU = 0 α = 0 B <sub>8</sub> = 60 cpm
-21	7-18 1147	17 14	13					
-22								
-23								
-24								
-25	32877	11		MEDIUM DENSE (104R, 4/2) DARK GRAY/B BROWN WELL GRADED SAND. SOME GRAVEL. TRACE SILT. WBT.	SW	NA	NA	HMU = 0 α = 0 B <sub>8</sub> = 60 cpm
-26	7-18 1455	7 9	12					
-27								
-28								
-29								
-30				25.0 FT - BOTTOM OF BORING PIEZOMETER INSTALLED				

NOTES:

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CTCLONG 43  
 Driller: CRAG COULTER  
 ASST: CHRIS COULTER

BACKGROUND:

HMU = 0  
 α = 0  
 B<sub>8</sub> = 40-80 cpm



4/4

# FERNALD RI/FS

1112

## PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. M. GARMAN DATE 7-24-90  
 PROJECT NO. 602 3.2.1 CHECKED BY E. Trollinger DATE 7-28-90  
 BORING NO. 2393  
 PIEZOMETER NO. 2393 DATE OF INSTALLATION 7-24-90

### BOREHOLE DRILLING

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID(S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0 FT</u> TO <u>29.0 FT</u> FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE(S) USED: SIZE <u>10.25 ID</u> FROM <u>0 FT</u> TO <u>30.0 FT</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

### PIEZOMETER DESCRIPTION

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 IN</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 IN</u> I.D. <u>4 IN</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 IN</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u>
TOTAL PERFORATED AREA <u>15.0 FT</u>	

### PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED LOCKING LID COVER WITH PADLOCK</u>
PROTECTIVE PIPE O.D. <u>10.75 IN</u>	

ITEM	DISTANCE ABOVE / BELOW GROUND	ABOVE / BELOW SURFACE (FT)	ELEVATION ( )	
TOP OF RISER PIPE		+ 2.0		
GROUND SURFACE		0.0		
BOTTOM OF PROTECTIVE PIPE		- 2.5		
BOREHOLE FILL MATERIALS:				
GROUT / SLURRY <u>NONE USED</u>	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
BENTONITE PELLETS	TOP <u>0.0</u>	BOTTOM <u>6.0</u>	TOP	BOTTOM
SAND	TOP <u>6.0</u>	BOTTOM <u>29.0</u>	TOP	BOTTOM
GRAVEL <u>NONE USED</u>	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>10.4</u>	BOTTOM <u>25.4</u>	TOP	BOTTOM
PIEZOMETER TIP		<u>27.4</u>		
BOTTOM OF BOREHOLE		<u>29.0</u>		
GWL AFTER INSTALLATION		<u>12.9 FT</u>		

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO  77

REMARKS VOIDING GROUT WAS NOT USED BECAUSE THE HOLE WAS SHALLOW ENOUGH THAT THE BENTONITE PLUG WAS WITHIN 1.0 FT OF GROUND SURFACE.

## VISUAL CLASSIFICATION OF SOILS

Date	7/28/90			
Initial	E.T.			
Field Check		1st Key In	2nd Key In	Hard Copy Verification

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS	DATE: 7-26-90
BORING NUMBER: 2396	COORDINATES:	DATE STARTED: 7-25-90
ELEVATION:	GWL: Depth 5.85ft Date/Time 7-27 <sup>th</sup> 0800	DATE COMPLETED: 7-26-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth	Date/Time
DRILLING METHODS: CABLE TOOL		PAGE 1 OF 3

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0				FOR DESCRIPTION OF SOIL ENCOUNTERED IN MW-2396, SEE LOG OF MW-3396.			
5							
10							
15							
20							
25							

NOTES:

Drilling Contractor PEWEE DRILL CO.

Drilling Equipment BOYRUS ERIE

Driller: D. NEWMAN  
ASST. B. JOHNSON

# FERNALD RI/FS

1112

## PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. M. SWANSON DATE 7-25-90  
 PROJECT NO. 602 3.2.1 CHECKED BY E. Trullinger DATE 7-28-90  
 BORING NO. 2396  
 PIEZOMETER NO. 2396 DATE OF INSTALLATION 7-26-90

### BOREHOLE DRILLING

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID(S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0 FT</u> TO <u>25.0 FT</u> FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE(S) USED: SIZE <u>10.0 ID</u> FROM <u>0 FT</u> TO <u>25.0 FT</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

### PIEZOMETER DESCRIPTION

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 in.</u> I.D. <u>4 in.</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in.</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u>
TOTAL PERFORATED AREA <u>15 FT</u>	

### PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED, LOCKING</u>
PROTECTIVE PIPE O.D. <u>10.75 in.</u>	<u>LID COVER WITH PADLOCK</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
	TOP	BOTTOM	TOP	BOTTOM
TOP OF RISER PIPE	+ 2.0			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	- 2.5			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP N/A	BOTTOM N/A	TOP	BOTTOM
BENTONITE	TOP 0.0	BOTTOM 3.3	TOP	BOTTOM
SAND	TOP 3.3	BOTTOM 22.0	TOP	BOTTOM
GRAVEL	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 4.0	BOTTOM 19.0	TOP	BOTTOM
PIEZOMETER TIP	21.0 FT			
BOTTOM OF BOREHOLE	25.0 FT			
GWL AFTER INSTALLATION	5.85 FT on 7-27-90			

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

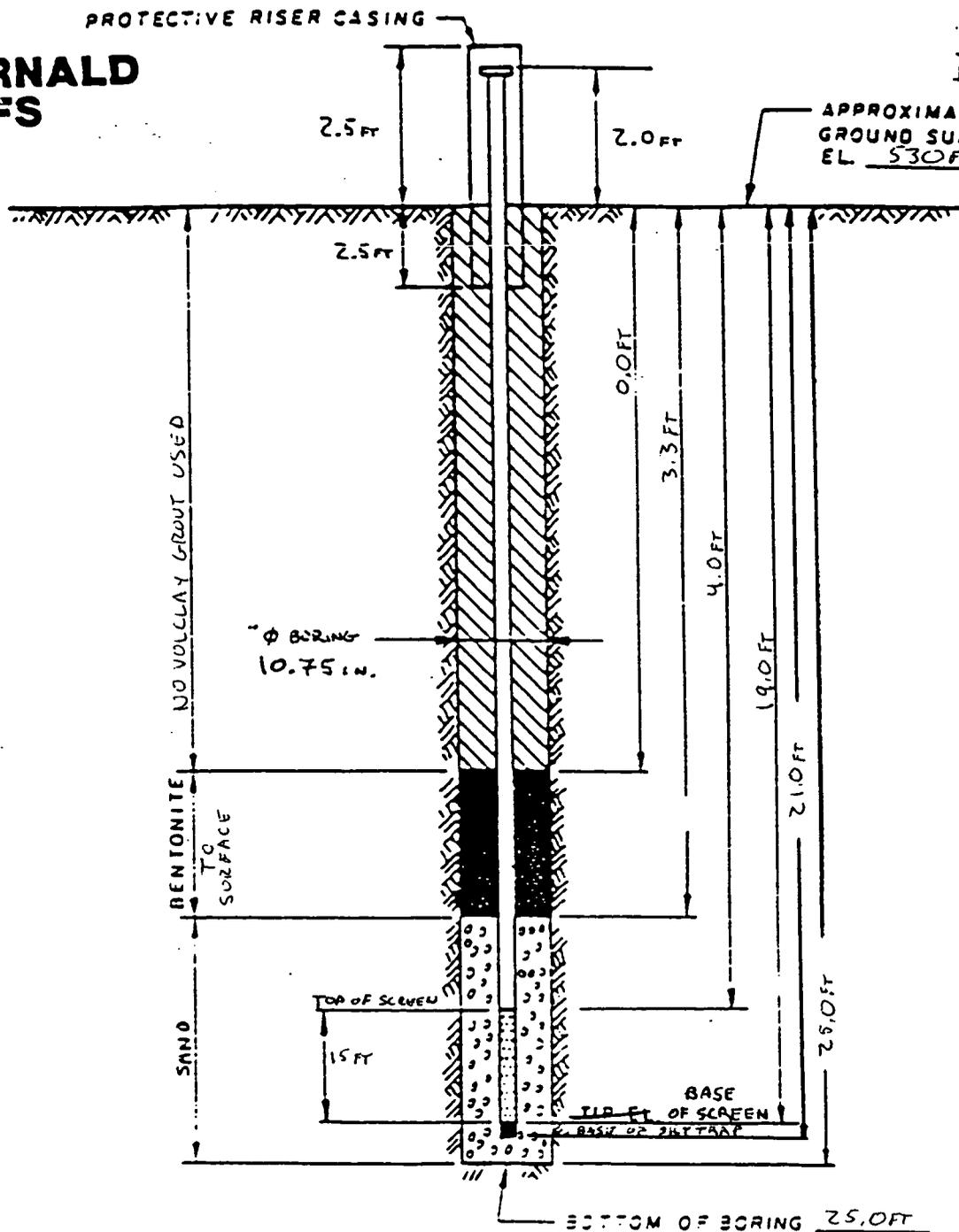
79

REMARKS NO GROUT USED DUE TO FACT THAT NATURAL MATERIALS, AS WELL AS LACK OF FOOTAGE (DUE TO WATER TABLE) IN HOLE, CREATED NECESSITY FOR BENTONITE PLUG TO SURFACE

# FERNALD RI/FS

1112

APPROXIMATE EXISTING  
GROUND SURFACE  
EL 53.0 FT



DRAWING NUMBER	
CHECKED BY	
APPROVED BY	
DRAWN BY	9718A
	7-27-90

**NOTES:**

1. RISER PIPE 1.54.0 IN 10 SCHEDULE PIPE, THREADED, FLUSH-JOINTED.
2. SCREEN 1.54.0 IN 1.0 SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED. (WITH WELDED SILT TRAP)
4. ELEVATION OF WATER LEVEL 5.85 FT
5. WATER LEVEL READING ON 7-27-90

INSTALLATION DETAILS  
MONITORING WELL # 2396

PREPARED FOR  
FERNALD RI/FS

**MATERIALS USED DURING WELL INSTALLATION:**

- 18 80 LB. BAGS OF 10/20 SAND
- 8 50 LB. BAGS OF VOLCLAY GROUT
- 8 5 GAL. BUCKETS OF BENTONITE PELLETS
- 200 GALLONS OF WATER USED DURING GROUTING AND DRILLING PROCEDURES
- SS PIPE SECTIONS: 8'-15 FT SCREEN WITH 2 FT WELDED SILT TRAP; 1'-5 FT SECTION RISER; 1'-1 FT SECTION RISER

**VISUAL CLASSIFICATION OF SOILS**

Date	7/31/90			
Initials	E.T.			
Field Check		11 6 in	100 47 in	H <sub>2</sub> O Cub Verification

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: J-2397	COORDINATES:	DATE: 7/24/90
ELEVATION:	GWL Depth 48' Date/Time 7/27/90	DATE STARTED: 7/24/90
ENGINEER/GEOLOGIST: J. Lear	Depth Date/Time 09:00	DATE COMPLETED: E.T. 7-29-90
DRILLING METHODS: CABLE TOOL	GWL Depth 53.4' 7/30/90 8:00	PAGE 1 OF 17

DEPTH (F.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 in)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
1	32935 1305 7/24	3 6 10	12"	medium stiff 4/3 10YR brown, clayey silt, slight plasticity, dry	ML	.75	H <sub>2</sub> O = 0 B <sub>2</sub> = 140 α = 0
2	32936 1308 7/24	6 12 18	6	stiff, 4/6 10YR, dark yellowish brown, clayey silt, slight plasticity, dry	ML	2.0	H <sub>2</sub> O = 0 B <sub>2</sub> = 30 α = 0
3	32937 1320 7/24	12 12 12	5	S.A.A.	ML	2.0	H <sub>2</sub> O = 0 B <sub>2</sub> = 100 α = 0
5	32938 1325 7/24	10 16 18	8	stiff, 4/6 10YR, yellowish brown clayey silt some sand trace gravel low plasticity moist	OL	1.5	H <sub>2</sub> O = 0 B <sub>2</sub> = 140 α = 0
6	32939 1340 7/24	18 15 20	10	stiff 5/4 10YR yellowish brown silty clay some gravel trace sand medium plasticity trace some moist	ML	1.75	H <sub>2</sub> O = 0 B <sub>2</sub> = 100 α = 0
8	32940 1617 7/24	4 6 15	12	very stiff 5/6 10YR yellowish brown clayey silt trace sand gravel moist	ML	2.0	H <sub>2</sub> O = 0 B <sub>2</sub> = 80 α = 0
9	32941 1640 7/24	7 10 13	10	very stiff 5/1 10YR gray clayey silt some sand trace gravel slight plasticity moist	ML	2.0	H <sub>2</sub> O = 0 B <sub>2</sub> = 80 α = 0
11	32942 1653 7/24	3 8 15	10	stiff 10YR, 5/1 gray clayey silt trace gravel & sand slight plasticity moist.	ML	1.25	H <sub>2</sub> O = 0 B <sub>2</sub> = 50 α = 0
13	32943 0915 7/25	12 25 25	NR	NR			H <sub>2</sub> O = 0 B <sub>2</sub> = α = 0
14	32944 0820 7/25	12 25 25	6	stiff 5/1 10YR clayey silt trace sand some gravel slight plasticity moist.	ML	1.5	H <sub>2</sub> O = 0 B <sub>2</sub> = 100 α = 0

NOTES:

Drilling Contractor Penn Drilling  
 Drilling Equipment cable tool  
 Driller: Joe Barile Gary Krepps

	Background	Serial	Inst
H <sub>2</sub> O	0	71111	NA
B <sub>2</sub>	120	32937	18
b	0	55361	9

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS		
BORING NUMBER: 2397	COORDINATES:	DATE: 7/25/90	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7/24/90
ENGINEER/GEOLOGIST: J. Lear	Depth	Date/Time	DATE COMPLETED: 7/29/90
DRILLING METHODS: CABLE TOOL			PAGE 2 OF 57

DEPTH (FT.)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (%)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	32945 8:45 7/25	8 16 24	3	stiff s/l 10yr clayey silt trace sand some gravel slight plasticity moist	ML	1.5 JL 7/25	H <sub>nu</sub> = 0 B <sub>α</sub> = 140 b = 0
17	32946 9:00 7/25	6 10 14	7	J.A.A.	ML	1.5 JL 7/25	H <sub>nu</sub> = 0 B <sub>α</sub> = 80 b = 0
19	32947 9:20 7/25	3 7 15	6	19.0 FT. S.A.A. JL 7/25	ML CL	1.5 1.0	H <sub>nu</sub> = 0 B <sub>α</sub> = 80 b = 0
20	32948 10:30 7/25	8 12 34	7	medium stiff 4/6 <del>10yr</del> yellowish brown very stiff s/l 10yr grey clayey silt trace sand some gravel slight plasticity moist 20.5 ft	ML	2.0	H <sub>nu</sub> = 0 B <sub>α</sub> = 30 b = 0
21	32949 10:45 7/25	20 30 45	4	dense 4/6 10yr dark yellowish brown well sorted moist very dense 4/6 10yr dark yellowish brown gravelly sand poorly sorted moist	SM SW	NA	H <sub>nu</sub> = 0 B <sub>α</sub> = 50 b = 0
22	32950 11:15 7/25	30 45 50	6	very dense 4/6 10yr dark yellowish brown gravelly sand trace silt poorly sorted moist	SW	NA	H <sub>nu</sub> = 0 B <sub>α</sub> = 80 b = 0
25				→ THESE SAMPLES LOST BY ACCIDENT, BOTTLES BROKE AFTER WELL INSTALLED. NONCONFORMANCE REPORT # 29 WAS FILED TO QA ON 7-31-90 E.T.			
26							
27							
29							
29							

Aquifer begins

NOTES:  
 Drilling Contractor Penn Drilling  
 Drilling Equipment cable tool  
 Driller: Joe Barile Gary Krepps

H <sub>nu</sub>	86	Serial	No
B <sub>α</sub>	0	71111	NA
b	100	72937	18
	0	55321	9

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 602.37	PROJECT NAME: FMPG RI/FS
BORING NUMBER: 2397	COORDINATES:
ELEVATION:	GWL: Dean Date/Time
ENGINEER/GEOLOGIST: J. Lear	Dean Date/Time
DRILLING METHODS: cable tool	DATE STARTED: 7/25/90
	DATE COMPLETED: 8/29/90
	PAGE 3 OF 87

DEPTH (ft)	SAMITE	TYPE & NO	BLOWS ON SAMPLER	RECOVERY (%)	DESCRIPTION	TEST SYMBOL	MEASURED COMPACTNESS (pcf)	REMARKS
30								
31	32951	12	18	15	Dense 4/6 10yr dark yellowish brown poorly sorted some gravel trace silt damp	SW		H <sub>n</sub> U = 0 B <sub>α</sub> = 180 t = 0
32	7/25	24						
33								
34								
35	32952	17	25	6	very dense 4/6 10yr dark yellowish brown poorly sorted sand some silt trace gravel damp	SW	NA	H <sub>n</sub> U = 0 B <sub>α</sub> = 180 t = 0
36	7/25	35						
37								
38								
39								
40	32953	54/5	6		very dense 4/3 10yr dark brown poorly sorted sand some gravel moist	SW	NA	H <sub>n</sub> U = 0 B <sub>α</sub> = 80 t = 0
41	7/25							
42								
43								
44								
45								

sample lost  
bottle broke

NOTES  
 Drilling Contractor Penn Drilling  
 Drilling Equipment cable tool  
 Driller: Joe Barile Gary Krupps

86	Serial	No
H <sub>n</sub> U 0	71111	NA
B <sub>α</sub> 120	72937	18
t 0	55361	9

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER 602.3.7	PROJECT NAME FMPC RIFS	
BORING NUMBER 2397	COORDINATES	DATE 7/26
ELEVATION:	GWL: Depth 49' Date/Time 7/27/90	DATE STARTED 7/24/90
ENGINEER/GEOLOGIST J. Lear	Depth Date/Time 09:00	DATE COMPLETED 7-29-90
DRILLING METHODS cable tool	PAGE 4 OF 87	

DEPTH (ft)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
46	32954 0930 7/26	50 3	3	very dense 1/4 10yr, dark yellowish brown poorly sorted sand some gravel trace silt moist	SW	NA	H <sub>nu</sub> = 0 B <sub>α</sub> = 40 b = 0
47							
49							
49							
50	(32955)	50		J A A	SW	NA	H <sub>nu</sub> = 0 B <sub>α</sub> = 90 b = 0
51	1030 7/26	5	5				
52							
53							
54							
55	32956	14		very dense 5/2 10yr grayish brown well sorted sand trace silt wet	SP	NA	H <sub>nu</sub> = 0 B <sub>α</sub> = 90 b = 0
56	11:40 7/26	24 50	6				
57							
58							
59							
60							

H<sub>2</sub>O level →

sample broken  
55' bottle

<b>NOTES:</b> Drilling contractor - Penn Driller Drilling equipment - cable tool Drillers - Joe Barile, Gary Krepps	BC	Serial	No.
	H <sub>nu</sub> 0	71111	NA
	B <sub>α</sub> 120	22937	18
	0	55361	9

**VISUAL CLASSIFICATION OF SOILS**

**1112**

PROJECT NUMBER <b>662-37</b>		PROJECT NAME: <b>FMPG RIFS</b>	
BORING NUMBER <b>2397</b>		COORDINATES:	DATE <b>7/26/90</b>
ELEVATION:		GWL: Depth      Date/Time	DATE STARTED: <b>7/24/90</b>
ENGINEER/GEOLOGIST <b>J. Lear</b>		Depth      Date/Time	DATE COMPLETED: <b>7-29-90</b>
DRILLING METHODS: <b>cable tool</b>			PAGE <b>5</b> OF <b>8</b>

DEPTH	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
60							
61	<b>32957</b> 7:40 7/26	17 34 28	8	Very dense 5/10yr Gray poorly sorted sand some gravel wet	SW	NA	$H_u = 0$ $B_\alpha = 140$ $\gamma = 0$
62							
63							
64							
65	<b>32958</b> 14:30 7/26	34 <b>50</b> 5	7	very dense 4/10yr dark gray poorly sorted sand some gravel trace silt, wet	SW	NA	$H_u = 0$ $B_\alpha = 240$ $\gamma = 0$
66							
67							
68							
69							
70	<b>32959</b> 15:00 7/26	11 11 15	8	medium dense 4/10yr dark gray poorly sorted sand some gravel trace silt, wet	SW	NA	$H_u = 0$ $B_\alpha = 280$ $\gamma = 0$
71							
72				SAMPLING ENDED @ 71.5 FT. DRILLING ENDED @ 70.0 FT.  *BOTTOM OF BORING			

sample lost, broken bottle

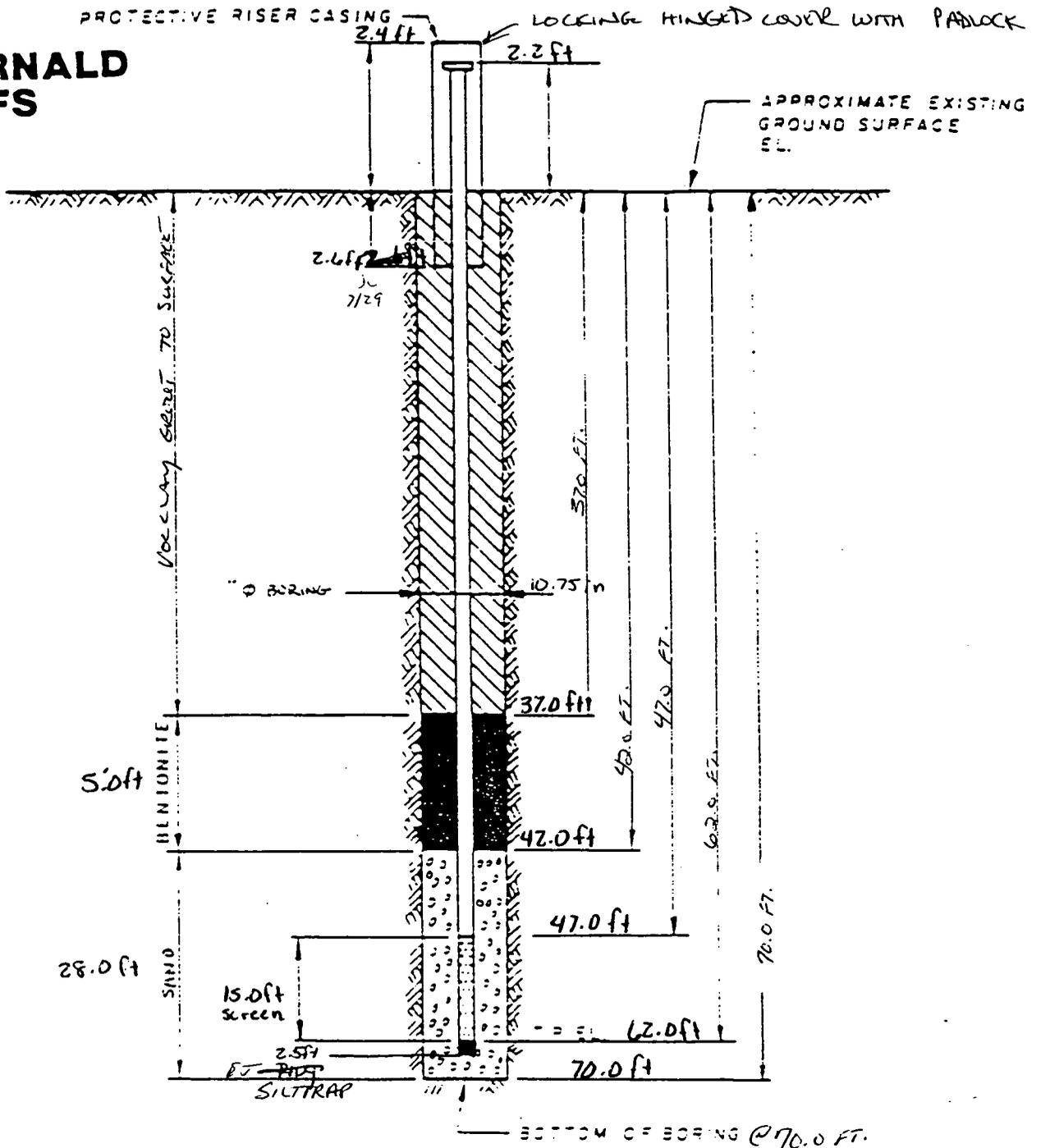
lost sample bottle BROKE

NOTES  
Drilling contractor - Penn Drilling  
Drilling equipment - cable tool  
Diller - Joe Barile Gary Krapps

Drum Sample # **32960**  
7/26/90 @ 15:20  

$H_u$	0	Serial	71111	NO
$B_\alpha$	120		72937	19
$\gamma$	0		55361	9

**FERNALD  
RI/FS**



DRAWING NUMBER

CHECKED BY  
APPROVED BY

J. Legg

DRAWN BY

**NOTES**

1. RISER PIPE 1.540 IN 10 SCHEDULE PIPE, THREADED, FLUS-JOINTED.
2. SCREEN 1.540 IN 1.0 SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN SLOT SIZE)
3. LOWER END OF SCREEN IS CAPPED WITH WELDED SILTRAP
4. ELEVATION OF WATER LEVEL 49.0 FT 53.0 FT
5. WATER LEVEL READING ON 7-27-90, 7-30-90

materials used during installation

- 19 Bags of sand 80 lbs ea.
- 9 Bag of volclay 50 lbs ea.
- 8 Buckets of bentonite pellets 5 gals ea.
- 800 gals of H<sub>2</sub>O during drilling and grouting

INSTALLATION DETAILS  
MONITORING WELL 2397

PREPARED FOR  
Fernald RI/FS  
Stainless steel used - 4-10ft sections,  
1- 5ft sections, 1- 2ft section  
1- 2.5ft Plug, 1- 15ft screen

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME FMPC RIFS FIELD ENG./GEO. J. Lear DATE 7/29/30  
 PROJECT NO. 602.3.7 CHECKED BY C. Toddling DATE 7-31-90  
 BORING NO. 2397  
 PIEZOMETER NO. 2397 DATE OF INSTALLATION 7-29-30

**BOREHOLE DRILLING**

DRILLING METHOD <u>cable tool</u>	TYPE OF BIT <u>Hammer</u>
DRILLING FLUID (S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0.0ft.</u> TO <u>70.0ft</u> FLUID <u>—</u> FROM <u>—</u> TO <u>—</u>	CASING SIZE (S) USED: SIZE <sup>10.0in ID</sup> <u>10.0ft</u> FROM <u>25.0</u> TC <u>70.0 ft.</u> E.T. SIZE <u>5.0ft</u> FROM <u>0.0ft</u> TO <u>25.0ft</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>Monitoring well</u>	RISER PIPE MATERIAL <u>Stainless steel</u>
DIAMETER OF PERFORATED SECTION <u>4.0in ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 in</u> I.D. <u>4.0in</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SCREEN <input checked="" type="checkbox"/> <u>SCOTTED</u>	LENGTH OF PIPE SECTIONS <u>10.0ft 5.0ft 2.0ft</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in</u>	JOINING METHOD <u>threaded FLUSH JOINED</u>
TOTAL PERFORATED AREA <u>15.0ft</u>	<u>SCREW TYPE</u>

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5.0ft</u>	OTHER PROTECTION <u>Hinged locking cap</u>
PROTECTIVE PIPE O.D. <u>10 3/4 in</u>	<u>WITH PADLOCKS</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT.)		ELEVATION ( )	
TOP OF RISER PIPE	2.4 ft			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.6 ft			
BOREHOLE FILL MATERIALS: vol. GROUT/SLURRY	TOP	BOTTOM	TCP	BOTTOM
	0.0ft	37.0ft		
	BENTONITE PELLETS			
	TOP	BOTTOM	TOP	BOTTOM
SAND 10/20 SPEC				
TOP	BOTTOM	TOP	BOTTOM	
GRAVEL <sup>ET</sup> NONE USED				
TOP	BOTTOM	TOP	BOTTOM	
N/A	N/A	N/A	N/A	
PERFORATED SECTION	TOP	BOTTOM	TOP	BOTTOM
	47.0ft	62.0ft		
PIEZOMETER TIP	62.0ft ET 64.5ft			
BOTTOM OF BOREHOLE	70.0ft			
GWL AFTER INSTALLATION	53.4 ft on 7-30-90			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO  87  
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS 3 of the 9 buckets of bentonite were added around and in protective cover area.

Date	7/1/90		
Initial	ET		
Field Check		1st Key In	2nd Key In
		Fluid Cont. Verification	

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.32.1</u>	PROJECT NAME
BORING NUMBER: <u>3390</u>	COORDINATES
ELEVATION:	GWL: Depth
ENGINEER/GEOLOGIST: <u>M. GARMAN</u>	Depth
DRILLING METHODS: <u>CABLE TOOL</u>	

FMPC RIFFS		DATE	<u>7-25-90</u>
Date/Time	DATE STARTED:	<u>7-25-90</u>	
Date/Time	DATE COMPLETED:	<u>7-31-90</u>	
PAGE	<u>1 OF 7</u>		

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (PS)	WELL CONSTRUCTION	REMARKS
0				SEE VISUAL CLASSIFICATION				
5				LOG FOR MW 2390				
10				FOR 0.0 - 70.0 FT. INTERVAL				
15								
20								
25								
30								
35								
40								
45								
50								
55								
60								
65								
70								

NOTES:  
 Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
ASST. CHRIS COULTER

BACKGROUND:  
 HNU = 0 PPM  
 L = 0 CPM  
 YB = 40-100 CPM

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.3.2.1</u>	PROJECT NAME: <u>FMP/ RIF/FS</u>	DATE: <u>7-27-90</u>
BORING NUMBER: <u>3390</u>	COORDINATES:	DATE STARTED: <u>7-25-90</u>
ELEVATION:	GWL: Depth	DATE COMPLETED: <u>7-31-90</u>
ENGINEER/GEOLOGIST: <u>M. GARMAN</u>	Depth	PAGE: <u>2 OF 7</u>
DRILLING METHODS: <u>CABLE TOOL</u>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TEST)	NA WELL CONSTRUCTION	REMARKS
70	32879	16		MEDIUM DENSE (10YR, 5/2) GRAYISH BROWN WELL GRADED SAND. SOME SILT. WET.	SW	NA		WU = 0
71	7-27 1440	18 12	13					α = 0 γB = 60 cpm
72								
73								
74								
75	32880	2		MEDIUM DENSE (10YR, 5/2) GRAYISH BROWN WELL GRADED SAND. TRACE FINE GRAVEL. TRACE SILT. WET.	SW	NA		WU = 0
76	7-27 1510	2 9	18					α = 0 γB = 60 cpm
77								
78								
79								
80	32881	2		MEDIUM DENSE (10YR, 5/3) BROWN WELL GRADED SAND. TRACE SILT. TRACE FINE GRAVEL. WET.	SW	NA		WU = 0
81	7-27 1620	4 7	18					α = 0 γB = 50 cpm
82								
83								
84								
85								

NOTES:

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAG COULTER  
 ASST. CHRIS COULTER

BACKGROUND:

WU = 0 ppm  
 α = 0 cpm  
 γB = 40-100 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602.3.2.1</b>	PROJECT NAME <b>FMPC RI/FS</b>	DATE <b>7-28-90</b>
BORING NUMBER <b>3390</b>	COORDINATES	DATE STARTED <b>7-25-90</b>
ELEVATION	GWL: Depth	DATE COMPLETED <b>7-31-90</b>
ENGINEER/GEOLOGIST <b>M. GARMAN</b>	Depth	PAGE <b>3 OF 7</b>
DRILLING METHODS <b>CABLE TOOL</b>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLE PER (6 IN.)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (FS)	NA WELL CONSTRUCTION	REMARKS
85	32882	3		LOOSE (10YR, 5/3) BROWN WELL GRADED SAND. TRACE SILT. TRACE GRAVEL. WET.	SW	NA		HNU = 0
86	7-28 0914	3 4	12					α = 0
87								γB = 80 cpm
88								
89								
90	32883	6		MEDIUM DENSE (10YR, 5/3) BROWN WELL GRADED SAND. TRACE GRAVEL. WET.	SW	NA		HNU = 0
91	7-28 1000	9 11	10					α = 0
92								γB = 70 cpm
93								
94								
95	32884	50/5 in		VERY DENSE (10YR, 5/3) BROWN GRAVELLY WELL GRADED SAND. WET.	SW	NA		HNU = 0
96	7-28 1135		5					α = 0
97								γB = 70 cpm
98								
99								
100								

NOTES:

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
 ASST: CHRIS COULTER

BACKGROUND:

HNU = 0 ppm  
 α = 0 cpm  
 γB = 40-120 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER	602.3.2.1	PROJECT NAME	FMPD RI/FS
SPRING NUMBER	3390	COORDINATES	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST	M. GARMAN	Depth	Date/Time
DRILLING METHODS	CABLE TOOL		

DATE 7-28-90  
DATE STARTED: 7-25-90  
DATE COMPLETED: 7-31-90  
PAGE 4 OF 7

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLE/LIT PER (G/N)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (%)	NA WELL CONSTRUCTION	REMARKS
100	32885 7-28 1350	50 1/4 in	4	VERY DENSE (104R, 5/16) BROWN WELL GRADED SAND. SOME GRAVEL. TRACE SILT. WET.	SW	NA		HVU = 0 d = 0 γB = 70 cpm
101								
102								
103								
104								
105	32886 7-29 0820	10 12 13	16	MEDIUM DENSE (104R, 5/16) BROWN WELL GRADED SAND. SOME SILT. WET.	SW	NA		HVU = 0 d = 0 γB = 70 cpm
106								
107								
108								
109								
110	32887 7-29 0843	3 3 3	11	LOOSE (104R, 5/16) GRAYISH BROWN WELL GRADED SAND. SOME GRAVEL. SOME SILT. WET.	SW	NA		HVU = 0 d = 0 γB = 40 cpm
111								
112								
113								
114								
115								

NOTES:

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
 ASST: CHRIS COULTER

BACKGROUND:

HVU = 0 ppa  
 d = 0 cpm  
 γB = 40-120 cpm

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <u>602.32.1</u>	PROJECT NAME: <u>FMPL RI/FS</u>	DATE: <u>7-29-90</u>
BORING NUMBER: <u>3390</u>	COORDINATES:	DATE STARTED: <u>7-25-90</u>
ELEVATION:	GWL: Depth	DATE COMPLETED: <u>7-31-90</u>
ENGINEER/GEOLOGIST: <u>M. GARMAN</u>	Depth	PAGE: <u>5</u> OF <u>7</u>
DRILLING METHODS: <u>CABLE TOOL</u>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER (6 IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED LAZERSHIFT (ESP)	UA WELL CONSTRUCTION	REMARKS
115	32888 7-29 0330	10 14 20	18	DENSE (104R, S/3) BROWN WELL GRADED SAND. TRACE GRAVEL. TRACE SILT. WET.	SW	NA		HVU = 0 α = 0 γB = 70 cpm
120	32889 7-29 0350	6 8 11	14	MEDIUM DENSE (104R, S/2) <sup>GRAYISH BROWN</sup> WELL GRADED SAND. SOME GRAVEL. TRACE SILT. WET.	SW	NA		HVU = 0 α = 0 γB = 60 cpm
125	32890 7-29 1120	4 5 7	15	MEDIUM DENSE (104R, S/2) GRAYISH BROWN WELL GRADED SAND. TRACE SILT. WET.	SW	NA		HVU = 0 α = 0 γB = 60 cpm

NOTES.

Drilling Contractor PENNSYLVANIA DRILLING  
 Drilling Equipment CYCLONE 43  
 Driller: CRAIG COULTER  
 ASST: CHRIS COULTER

BACKGROUND:

HVU = 0 ppm  
 α = 0 cpm  
 γB = 40-120 cpm



**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME EMPC RI/FS FIELD ENG./GEO. M. GARMAN DATE 7-29-90  
 PROJECT NO. 602 3.2.1 CHECKED BY E. TROLLINGER DATE 9-1-90  
 BORING NO. 3390  
 PIEZOMETER NO. 3390 DATE OF INSTALLATION 7-31-90

**BOREHOLE DRILLING**

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID(S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>0 FT</u> TO <u>126.5 FT</u> FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE(S) USED: SIZE <u>10.0 IN ID</u> FROM <u>0 FT</u> TO <u>126.5 FT</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

**PIEZOMETER DESCRIPTION**

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 IN ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 IN.</u> I.D. <u>4 IN.</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 IN.</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u>
TOTAL PERFORATED AREA <u>10.0 FT</u>	

**PROTECTION SYSTEM**

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED LOCKING</u>
PROTECTIVE PIPE O.D. <u>10.75 IN.</u>	<u>LID COVER</u>

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )		
TOP OF RISER PIPE		+ 2.0			
GROUND SURFACE		0.0			
BOTTOM OF PROTECTIVE PIPE		- 2.5			
BOREHOLE FILL MATERIALS: GROUT/SLURRY BENTONITE <u>NONE USED</u> SAND <u>10/20 SIZE</u> GRAVEL <u>NONE USED</u>	TOP	0.0	BOTTOM 95.0	TOP	BOTTOM
	TOP	NA	BOTTOM NA	TOP	BOTTOM
	TOP	95.0	BOTTOM 126.5	TOP	BOTTOM
	TOP	NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP	103.4	BOTTOM 113.4	TOP	BOTTOM
PIEZOMETER TIP		115.1			
BOTTOM OF BOREHOLE		126.5			
GWL AFTER INSTALLATION		45.1			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO  94  
 REMARKS \* - 20.0 FT OF BROKEN CASING LEFT IN BORING; BASE AT APPROX. 85.0 FT, TOP AT APPROX. 65.0 FT  
- 1 BUCKET BENTONITE USED IN AND AROUND PROTECTIVE WELL COVER.

Date	7/15/90			
Initial	E.T.			
F.M. Class		100 100 100 100		

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER 602 3.7	PROJECT NAME FMPC RI/FS		
BORING NUMBER 1277	COORDINATES	DATE 7-13-90	
ELEVATION: ≈ 590 ground	GWL: Depth	Date/Time	DATE STARTED: 7/13/90
ENGINEER/GEOLOGIST J. MASON	Depth	Date/Time	DATE COMPLETED: 7/13/90
DRILLING METHODS CME 45 AUGER			PAGE 1 OF 3

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
				REDRILL OF WELL 1277 (ORIGINAL WELL DESTROYED ACCIDENTALLY). FOR DESCRIPTION SEE VISUAL CLASSIFICATION OF SOILS SHEETS 1 & 2 OF 4 BY C. GRUBE, DATED 6/27/89. WELL SET AS PER SPECS		H <sub>nu</sub> = α = βγ =	
				ON PAGES 3 & 4 OF 4 BY C. GRUBE, SAME LOG.		H <sub>nu</sub> = α = βγ =	
						H <sub>nu</sub> = α = βγ =	
						H <sub>nu</sub> = α = βγ =	
						H <sub>nu</sub> = α = βγ =	

NOTES: CONTRACTOR: PENNDRILL  
 DRILLER: BOB YOST  
 ASSISTANT: BRIAN STRAPAZZAN

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
 COLOR I.D. BY MUNSELL COLOR CHART  
 BACKGROUND LEVELS: H<sub>nu</sub>: 1 ppm  
 α: 0 cpm  
 βγ: 400-600 cpm

H<sub>nu</sub>: B 221  
 α: ASI # 6  
 βγ: ASI # 11

95

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. J MASON DATE 7-16-90  
 PROJECT NO. 602 3.7 CHECKED BY E.J. DATE 7-21-90  
 BORING NO. 1292  
 PIEZOMETER NO. NA DATE OF <sup>PLUGGING</sup> INSTALLATION 7-16-90

**BOREHOLE DRILLING**

DRILLING METHOD <u>HOLLOW STEM AUGER</u>	TYPE OF BIT <u>HOLLOW AUGER</u>
DRILLING FLUID (S) USED: FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u> FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	CASING SIZE (S) USED: SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u> SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

**PIEZOMETER DESCRIPTION**

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

**PROTECTION SYSTEM**

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

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (FT)		ELEVATION ( )	
	TOP	BOTTOM	TOP	BOTTOM
TOP OF RISER PIPE	<u>NA</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>NA</u>			
BOREHOLE FILL MATERIALS:				
GROUT / SLURRY / CEMENT	TOP <u>0.0</u>	BOTTOM <u>1.0</u>	TOP	BOTTOM
BENTONITE	TOP <u>1.0</u>	BOTTOM <u>20.0</u>	TOP	BOTTOM
SAND	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
GRAVEL	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>NA</u>			
BOTTOM OF BOREHOLE	<u>20.0</u>			
GWL AFTER INSTALLATION	<u>NA</u>			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO  **96**  
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO   
 REMARKS DRY HOLE - PLUGGED ON 7-16-90 WITH BENTONITE AND CAPPED WITH CEMENT

Ordn	7/21/90			
Initial	J.T.			
Field	Block	1st Key In	2nd Key In	Hard Copy Verification

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>		
BORING NUMBER <b>1286</b>	COORDINATES	DATE <b>7/29/90</b>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/29/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/29/90</b>
DRILLING METHODS <b>CME 45 AUGER</b>			PAGE <b>1</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
①	18861 7-29 1030	NA	NA	FIRST FOOT CONSISTED OF BRICK, FLOOR LINER, AND CONCRETE	NA	NA	Hnu = 0 ppm α = 20 cpm BY = 600 cpm
	18862 7-29 1030	NA	NA		NA	NA	
②	18863 7-29 1100	3	6	medium dense, 10yr 5/6 yellowish brown clayey silt, slightly moist	ML	NA	
	18864 7-29 1100	5	6	SAA	ML	NA	Hnu = 0 α = 0
③	18865 7-29 1100	7	0	NR	NA	NA	BY = 80 cpm
	18866 7-29 1107	9	6	medium dense 10yr 5/6 to 10yr 5/1: yellowish brown to gray clayey silt, slightly moist	ML	NA	
④	18867 7-29 1107	12	5	SAA	ML	↓	Hnu = 0 α = 0
	18868 7-29 1107	13	0	NR	NA	↓	BY = 160 cpm
⑤	18869 7-29 1111	10	6	medium dense 10yr 5/6 yellowish brown clayey silt, slightly moist	ML	NA	
	18870 7-29 1111	13	6	medium dense 10yr 5/6 yellowish brown clayey silt, trace gravel, slightly moist	ML	↓	Hnu = 0 α = 0
⑥	18871 7-29 1111	15	0	NR	NA	↓	BY = 120 cpm
	18872 7-29 1115	7	6	medium dense 10yr 5/6 to 10yr 5/1 yellowish brown to gray clayey silt, trace gravel, slightly moist	ML	NA	
⑦	18873 7-29 1115	9	6	SAA	ML	NA	Hnu = 0 α = 0
	18874 7-29 1115	13	6	stiff 10yr 5/6 yellowish brown silty clay, slightly moist, low plasticity	CL	1.5	BY = 150 cpm
	18875 7-29 1125	10	6	stiff 10yr 5/6 yellowish brown silty clay, trace gravel, slightly moist, low plasticity	CL	1.5	Hnu = 0 α = 0 BY = 100 cpm

NOTES: CONTRACTOR: PENNDRILL  
DRILLER: BOB YOST  
ASSISTANT: BRIAN

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
COLOR I.D. BY MUNSELL COLOR CHART  
BACKGROUND LEVELS: Hnu: 0 ppm  
α: 0 cpm

Hnu: 8 222  
α: ASI # 6  
BY: ASI # 11

BY: 220 cpm **97**

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>		PROJECT NAME <b>FMPC RI/FS</b>	
BORING NUMBER <b>1286</b>		COORDINATES	DATE <b>7-29-90</b>
ELEVATION:		GWL: Depth      Date/Time	DATE STARTED <b>7/29/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>		Depth      Date/Time	DATE COMPLETED <b>7/29/90</b>
DRILLING METHODS <b>CME 45 AUGER</b>			PAGE <b>2</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ITSF)	REMARKS
8	18876 7-29 1125	13	6	dense 10yr 5/6 yellowish brown clayey silt, trace gravel, trace sand, slightly moist	ML	NA	H <sub>nu</sub> = 0 α = 0
	18877 7-29 1125	18	6	very stiff 10yr 6/6 brownish yellow silty clay, slightly moist	CL	3.75	β <sub>γ</sub> = 100 cpm
9	18878 7-29 1132	15	6	dense 10yr 6/4 light yellowish brown clayey silt, some gravel, trace sand, slightly moist	ML	NA	↑
	18879 7-29 1132	24	6	dense 10yr 5/3 brown clayey silt, some gravel, trace sand, slightly moist	ML	NA	H <sub>nu</sub> = 0 α = 0
10	18880 7-29 1132	19	6	SAA	ML	NA	β <sub>γ</sub> = 100 cpm
	18881 7-29 1215	18	6	very stiff 10yr 5/6 to 10yr 5/1 yellowish brown to gray silty clay, slightly moist, low plasticity	CL	2.5	↑
11	18882 7-29 1215	25	6	very stiff 10yr 5/1 gray silty clay, trace gravel, slightly moist, low plasticity	CL	2.75	H <sub>nu</sub> = 0 α = 0
	53415 7-29 1215	19	6	SAA	CL	2.5	β <sub>γ</sub> = 150 cpm
12	53416 7-29 1220	15	6	very stiff 10yr 5/1 gray silty clay, trace gravel, slightly moist, low plasticity	CL	2.75	↑
	53417 7-29 1220	17	4	stiff 10yr 5/1 gray silty clay, trace gravel, slightly moist, low plasticity	CL	1.75	H <sub>nu</sub> = 0 α = 0
13	53418 7-29 1220	19	0	NR	NA	NA	β <sub>γ</sub> = 100 cpm
	53419 7-29 1329	17	6	very stiff 10yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	2.5	↑
14	53420 7-29 1329	18	6	SAA	CL	2.0	H <sub>nu</sub> = 0 α = 0
	53421 7-29 1329	17	5	SAA	CL	2.0	β <sub>γ</sub> = 100 cpm
	53422 7-29 1334	18	6	very stiff 10yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	2.0	H <sub>nu</sub> = 0 α = 0 β <sub>γ</sub> = 220 cpm

NOTES: CONTRACTOR: PENNDRILL  
DRILLER: BOB YOST  
ASSISTANT: BRIAN STRAPAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
COLOR I.D. BY MUNSSELL COLOR CHART  
BACKGROUND LEVELS: H<sub>nu</sub>: 0

H<sub>nu</sub>: B 222  
α: ASI # 6  
β<sub>γ</sub>: ASI # 11

α: 0  
β<sub>γ</sub>: 220 cpm

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**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: <b>602 3.7</b>	PROJECT NAME: <b>FMPC RI/FS</b>		
BORING NUMBER: <b>1286</b>	COORDINATES:	DATE: <b>7-29-30</b>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/29/30</b>
ENGINEER/GEOLOGIST: <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/29/30</b>
DRILLING METHODS: <b>CME 45 AUGER</b>			PAGE: <b>3 OF 3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	53423 7-29 1334	17	6	stiff 10 yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	1.25	H <sub>nu</sub> = 0 α = 0 BY = 100 cpm
	53424 7-29 1334	30	6	SAA	CL	1.25	
	53425 7-29 1414	17	6	stiff 10 yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	1.5	
17	53426 7-29 1414	21	6	SAA	CL	1.25	H <sub>nu</sub> = 0 α = 0 BY = 100 cpm
	53427 7-29 1414	15	6	SAA	CL	1.5	
18	53428 7-29 1414	18	6	SAA	CL	1.5	
	53429 7-29 1421	11	6	very soft 10 yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	< 2.25	H <sub>nu</sub> = 0 α = 0 BY = 80 cpm
19	53430 7-29 1421	21	6	stiff, 10 yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	1.0	
	53431 7-29 1421	15	6	SAA	CL	2.0	
20	53432 7-29 1421	13	6	stiff 10 yr 5/1 gray silty clay, trace sand, trace gravel, slightly moist, low plasticity	CL	1.75	H <sub>nu</sub> = α = BY =
				BORING FILLED WITH BENTONITE AND PLUGGED WITH CEMENT TO SURFACE.			
				* NO WATER ENCOUNTERED DURING DRILLING, HOLE WAS DRY PLUGGED & ABANDONED.			H <sub>nu</sub> = α = BY =

NOTES: CONTRACTOR: PENNDRIILL  
DRILLER: BOB YOST  
ASSISTANT: BRIAN STRAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
COLOR I.D. BY MUNSELL COLOR CHART  
BACKGROUND LEVELS: H<sub>nu</sub>: 0  
α: 0  
BY: 220 cpm

H<sub>nu</sub>: B 222  
α: ASI #6  
BY: ASI #11

Parameter Sheet  
(Replacement)

Boring # - 1286

Bottom of Boring - 20.0

Comments

- No water encountered during drilling. Hole was dry Plugged & abandoned.

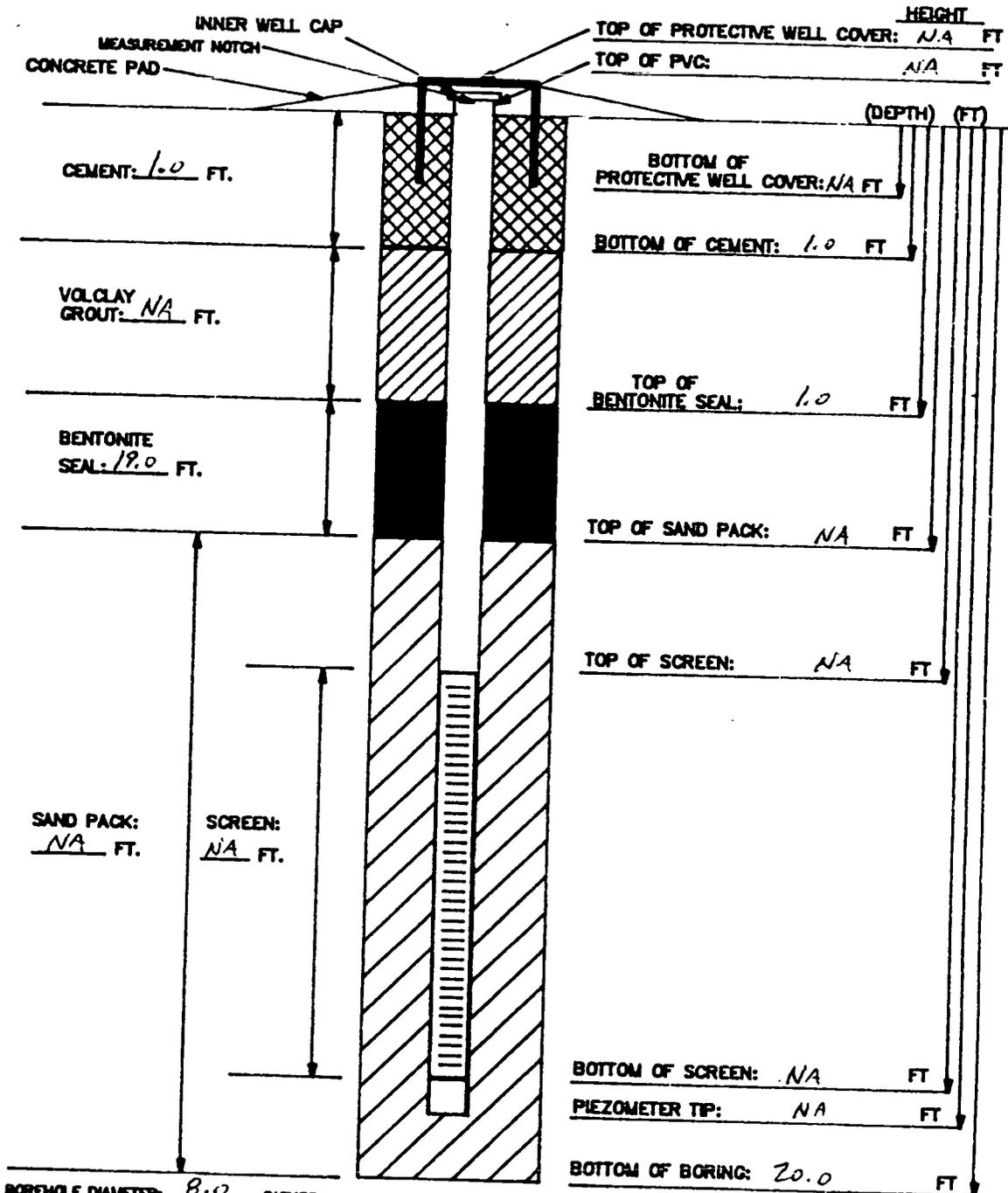
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2nd Key In		
Hard Copy Verification		

**FERNALD RI/FS**

INSTALLATION DIAGRAM  
MONITORING WELL NO.

1286

INSTALLATION DATE: 7-30-90



BOREHOLE DIAMETER: 8.0 INCHES

- MATERIALS USED:**
- SAND TYPE AND QUANTITY: NA
  - BENTONITE PELLETS (5-GALLON BUCKETS): 1
  - BAGS OF VOLCLAY GROUT: NA
  - AMOUNT OF CEMENT: 1 BAG JCM
  - AMOUNT OF WATER USED: 5 GAL 8-1-90
  - OTHER: NA

- NOTES:**
- 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 SLUMP.
  - 4) WATER DEPTH/DATE:
  - 5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
  - 6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

TASK: 602 3.7

GEOLOGIST/ENGINEER: J. MASON

Dist				
Initial	Est. 1/20/90			
End Date				
End Time				
End Day				
End Month				
End Year				
Project				

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>	DATE <b>7-10-90</b>
BORING NUMBER <b>1502</b>	COORDINATES	DATE STARTED <b>7/10/90</b>
LEVATION:	GWL: Depth Date/Time	DATE COMPLETED <b>7/10/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth Date/Time	PAGE <b>1</b> OF <b>3</b>
DRILLING METHODS <b>CME 45 AUGER</b>		

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
	00728 7-10-90 1355	6	6	Loose 10yr sli gray clayey silt, some gravel	ML	NA	Hnu = .20 ppm α = 0cpm βγ = 600 cpm
①	00729 7-10-90 1355	4	0	NR			
	00730 7-10-90 1355	5	0	NR			
②	00731 7-10-90 1400	8	6	SAA ( ) except some organic matt.	ML	NA	Hnu = .5 ppm α = 0 cpm βγ = 600 cpm
	00732 7-10-90 1400	8	2	SAA	ML	NA	
③	00733 7-10-90 1400	7	0	NR			
	00734 7-10-90 1404	10	6	Loose 10yr 4/11 dark gray clayey silt, trace gravel, organic matter	ML	NA	Hnu = 0 α = 0 βγ = 600 cpm
④	00735 7-10-90 1404	13	4	SAA	ML	NA	
	00736 7-10-90 1404	15	0	NR			
⑤	00737 7-10-90 1406	12	6	medium dense 10yr sli gray clayey silt	ML	NA	Hnu = 0 α = 0 βγ = 500 cpm
	00738 7-10-90 1406	10	6	SAA	ML	NA	
⑥	00739 7-10-90 1406	11	0	NR			
	00740 7-10-90 1427	4	6	SAA	ML	NA	Hnu = 0 α = 0 βγ = 500 cpm
⑦	00741 7-10-90 1427	5	4	very stiff 10yr sli yellowish brown silty clay	CL	2.0	
	00742 7-10-90 1427	6	0	NR			

NOTES: CONTRACTOR: DENNDRIILL  
 DRILLER: BOB YOST  
 ASSISTANT: BRIAN STRAPAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
 COLOR I.D. BY MUNSELL COLOR CHART  
 BACKGROUND LEVELS: Hnu: 1 ppm  
 α: 0 cpm  
 βγ: 1400-1500 cpm

Hnu: B221  
 α: ASI # 6  
 βγ: ASI # 11

\* (BACKGROUND LEVELS TAKEN ON PLASTIC SURFACE UPON WHICH SAMPLE SPOONS WILL LIE)

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**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>		
BORING NUMBER <b>1502</b>	COORDINATES:		DATE <b>7-10-90</b>
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/10/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/10/90</b>
DRILLING METHODS <b>CME 45 AUGER</b>			PAGE <b>3</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	00758 7-10-90 1600	3	6	Loose 10yr 6/8 brownish yellow sand poorly graded, some silt, trace gravel wet	SP	NA	Hnu = 0 α = 0 BY = 400 cpm
	00759 7-10-90 1600	3	6	SAA	SP	↓	
	00760 7-10-90 1600	7	6	Loose 10yr 5/1 gray silt, some sand and gravel, some clay, moist	ML	↓	
17	00761 7-10-90 1605	10	6	medium dense 10yr 6/8 brownish yellow sand, some silt; graded somewhat, wet	SP	NA	Hnu = 0 α = 0 BY = 500 cpm
	00762 7-10-90 1605	11	6	SAA	SP	↓	
18	00763 7-10-90 1605	9	6	med. dense 10yr 5/1 gray sandy silt, trace clay, wet	ML	↓	Hnu = 0 α = 0 BY = 400 cpm
	00764 7-10-90 1612	5	6	med dense 10yr 6/8 brownish yellow sand, some silt; graded slightly, wet	SP	NA	
19	00765 7-10-90 1612	6	6	SAA	SP	↓	Hnu = 0 α = 0 BY = 400 cpm
	00766 7-10-90 1612	7	4	very soft medium dense 10yr 5/1 gray sandy silty clay, trace gravel	CL	25	
20	00808 7-10-90 1612	0	0	NR		LCM 7-10-90 7-159c	Hnu = α = BY =
				BORING/SAMPLING STOPPED @ 20 FEET - CONCRETED AFTER FILLING WITH BENTONITE			
				# NO PIEZOMETER SET FOR GEOCHEM. <sup>ET</sup> LOCATIONS, 7-159c ONLY SAMPLING OF SOIL.			Hnu = α = BY =

NOTES: CONTRACTOR: PENNDRIU  
 DRILLER: BOB YOST  
 ASSISTANT: BRIAN STRAPAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
 COLOR I.D. BY MUNSELL COLOR CHART  
 BACKGROUND LEVELS: Hnu: 1 ppm  
 α: 0 cpm  
 BY: 1400 cpm

Hnu: B221  
 α: ASI # 6  
 BY: ASI # 11

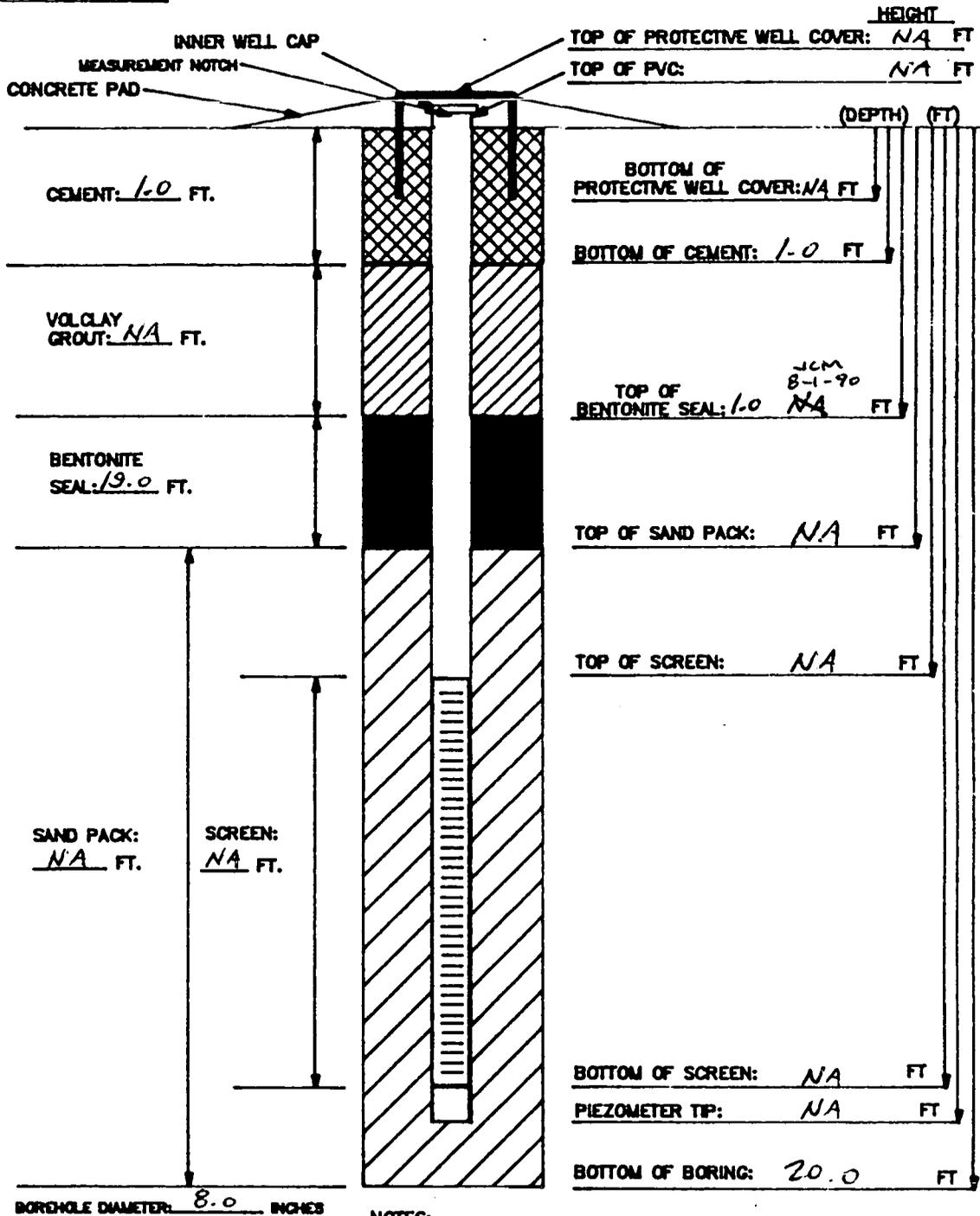
**103**

# FERNALD RI/FS

INSTALLATION DIAGRAM  
MONITORING WELL NO.

1502

PLUGGING  
INSTALLATION DATE: 7-11-90



**MATERIALS USED:**  
 SAND TYPE AND QUANTITY: NA  
 BENTONITE PELLETS (5-GALLON BUCKETS): 3  
 BAGS OF VOLCLAY GROUT: NA  
 AMOUNT OF CEMENT: 1/2 BAG  
 AMOUNT OF WATER USED: 5 GAL  
 OTHER: NA

- NOTES:**
- 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 BUMP.
  - 4) WATER DEPTH/DATE:
  - 5) TOP OF PVC IS SECURED WITH EXPANDABLE RUBBER PLUG AND PADLOCK.
  - 6) PARENTHESES INDICATE DEPTH BELOW GROUND LEVEL.

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME EMPC RI/FS FIELD ENG./GEO. J. MASON DATE 7-11-90  
 PROJECT NO. 602 3.7 CHECKED BY E.T. DATE 7-31-90  
 BORING NO. 1502  
 PIEZOMETER NO. NA DATE OF INSTALLATION PLUGGING 7-11-90

**BOREHOLE DRILLING**

DRILLING METHOD <u>HOLLOW STEM AUGER</u>	TYPE OF BIT <u>HOLLOW AUGER</u>
DRILLING FLUID (S) USED: FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u> FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	CASING SIZE (S) USED: SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u> SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

**PIEZOMETER DESCRIPTION**

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

**PROTECTION SYSTEM**

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

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	<u>NA</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>NA</u>			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY/CEMENT	TOP <u>0.0</u>	BOTTOM <u>1.0</u>	TCP	BOTTOM
BENTONITE	TOP <u>1.0</u>	BOTTOM <u>20.0</u>	TOP	BOTTOM
SAND	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
GRAVEL	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PERFORATED SECTION	TOP <u>NA</u>	BOTTOM <u>NA</u>	TOP	BOTTOM
PIEZOMETER TIP	<u>NA</u>			
BOTTOM OF BOREHOLE	<u>20.0</u>			
GWL AFTER INSTALLATION	<u>NA</u>			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO  **105**  
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO

REMARKS DRY HOLE - PLUGGED ON 7-11-90 WITH BENTONITE AND CAPPED WITH CEMENT.

1112  
**GLOCHEM BORING  
VISUAL CLASSIFICATION OF SOILS**

DATE	7/18/90			
TIME	ET			
NO. OF TESTS	1	2	3	4
NO. OF TESTS	1	2	3	4
NO. OF TESTS	1	2	3	4

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>		
BORING NUMBER <b>1503</b>	COORDINATES		DATE <b>7-1-90</b>
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/1/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/1/90</b>
DRILLING METHODS <b>CME 45 AUGER</b>			PAGE <b>1</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
①	00688 7-1-90 1115	6	3	medium stiff 10yr s/lb yellowish brown to brown gravelly clay	CL	1.0	H <sub>nu</sub> = 0 α = 40 cpm β <sub>γ</sub> = 250 cpm
	00689 7-1-90 1115	11	0	NR			
	00690 7-1-90 1115	8	0	NR			
②	00691 7-1-90 1120	6	4	SAA	CL	1.0	H <sub>nu</sub> = 4 ppm α = 40 cpm β <sub>γ</sub> = 200 cpm
	00692 7-1-90 1120	5	0	NR			
③	00693 7-1-90 1120	7	0	NR			
	00694 7-1-90 1123	5	6	stiff 10yr s/lb yellowish brown gravelly silty clay, slightly moist	CL	1.5	H <sub>nu</sub> = 0 α = 100 cpm β <sub>γ</sub> = 250 cpm
④	00695 7-1-90 1123	4					
	00696 7-1-90 1123	6					
⑤	00697 7-1-90 1125	5	6	loose 10yr s/lb yellowish brown to brown sandy silty gravel, poor graded sand & gravel	GM	NA	H <sub>nu</sub> = 4 α = 40-60 cpm β <sub>γ</sub> = 250 cpm
	00698 7-1-90 1125	2	0	NR			
⑥	00699 7-1-90 1125	4	0	NR			
	00700 7-1-90 1144	3	6	SAA	GM	NA	H <sub>nu</sub> = 0 α = 0
⑦	00701 7-1-90 1144	3	2	SAA	GM	NA	β <sub>γ</sub> = 150
	00702 7-1-90 1144	2		NR			

NOTES: CONTRACTOR: PENNDRIILL  
DRILLER: BOB YOST  
ASSISTANT: BRIAN STRAPAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
COLOR I.D. BY MUNSELL COLOR CHART  
BACKGROUND LEVELS: H<sub>nu</sub>: 4.5 ppm  
(READINGS IN SPOON EXAMINATION AREA) α: 0 β<sub>γ</sub>: 250 cpm

H<sub>nu</sub>: B 221  
α: ASI #6  
β<sub>γ</sub>: ASI #11

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Date				
Initial				
Field Check		1st Reg In	2nd Reg In	3rd Reg In
				3rd Reg In

**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>		
BORING NUMBER <b>1503</b>	COORDINATES:	DATE <b>7-1-90</b>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/1/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/1/90</b>
DRILLING METHODS: <b>CME 45 AUGER</b>			PAGE <b>2</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
8	00703 7-1-90 1147	2	0	NR			Hnu = 4 ppm α = 0
	00704 7-1-90 1147	1	0	NR			BY = 200 cpm
	00705 7-1-90 1147	1	0	NR			
9	00706 7-1-90 1150	2	6	very loose 10yr 4/3 brown medium graded gravel w poorly graded sand, some silt; wet	GM	NA	Hnu = 4 ppm α = 0 cpm
	00707 7-1-90 1150	1	2	SAA	GM	NA	BY = 400 cpm
10	00708 7-1-90 1150	1	0	NR			
	00709 7-1-90 1200	2	6	medium dense 10yr 5/6 yellowish brown well graded sandy silty gravel, wet	GM	NA	Hnu = 0 ppm α = 0 cpm
	00710 7-1-90 1200	7	3	medium dense 10yr 5/6 yellowish brown poorly graded silty sand, wet	SP	NA	BY = 200 cpm
11	00711 7-1-90 1200	8	0	NR			
	00712 7-1-90 1207	12	6	10yr 5/6 yellowish brown (DENSE) poorly graded sand, some gravel, some silt, wet	SP	NA	Hnu = 4 ppm α = 0 BY = 250 cpm
12	00713 7-1-90 1207	21	6	SAA			
	00714 7-1-90 1207	25	6	SAA			
13	00715 7-1-90 1212	21	6	dense 10yr 5/6 yellowish brown gravelly sand (poorly graded), wet	SP	NA	Hnu = 4 ppm α = 0 cpm
	00716 7-1-90 1212	23	6	SAA			BY = 200 cpm
	00717 7-1-90 1212	23	6	dense 10yr 5/6 yellowish brown gravelly sandy silt, wet	ML	NA	

NOTES: CONTRACTOR: PENNDRIU  
 DRILLER: BOB YOST  
 ASSISTANT: BRIAN STRATTON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
 COLOR I.D. BY MUNSELL COLOR CHART  
 BACKGROUND LEVELS: Hnu: 4 ppm  
 α: 0 cpm  
 BY: 400 cpm

Hnu: B 221  
 α: ASI # 6  
 BY: ASI # 11

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**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER <b>602 3.7</b>	PROJECT NAME <b>FMPC RI/FS</b>		
BORING NUMBER <b>1503</b>	COORDINATES.	DATE <b>7-1-90</b>	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: <b>7/1/90</b>
ENGINEER/GEOLOGIST <b>J. MASON</b>	Depth	Date/Time	DATE COMPLETED: <b>7/1/90</b>
DRILLING METHODS <b>ONE 45 AUGER</b>			PAGE <b>3</b> OF <b>3</b>

DEPTH (FT)	SAMPLE TYPE & NO	BLOWS ON SAMPLER PER 16 IN	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
16	00718 7-1-90 1230	5	6	medium dense 10yr 4/3 brown to 10yr-5/6 yellowish brown poorly graded sand, some silt, wet	SP	NA	Hnu = 4 α = 0 Bγ = 200 cpm
	00719 7-1-90 1230	6	2	SAA			
	00720 7-1-90 1230	9	0	NR			
17	00730 7-1-90 1240	12	6	SAA except trace silt, some gravel	SP		Hnu = 4 α = 0
	00731 7-1-90 1240	24	6	SAA except trace of silt, some gravel	SP		Bγ = 200 cpm
18	00732 7-1-90 1240	25	0	NR			
	00733 7-1-90 1250	9	6	dense 10yr 3/3 dark brown poorly graded sand; some gravel, and in some sections gravelly - Wet.	SP	NA	Hnu = 4 ppm α = 0 cpm Bγ = 100 cpm
19	00734 7-1-90 1250	12	6	SAA			
	00735 7-1-90 1250	18	6	SAA			
20	00736 7-1-90 1250	20	6	SAA			Hnu = α = Bγ =
				BORING/SAMPLING STOPPED @ 20 FT. HOLE PLUGGED WITH BENTONITE CLAY AND CAPPED WITH CEMENT.			
				<del>NO WATER ENCOUNTERED</del> E.T. 7-24-90			Hnu = α = Bγ =

NOTES: CONTRACTOR: PENNDRILL  
 DRILLER: BOB YOST  
 ASSISTANT: BRIAN STRAPAZZON

SAMPLES COLLECTED PER ASTM STANDARD PENETRATION  
 COLOR I.D. BY MUNSELL COLOR CHART  
 BACKGROUND LEVELS: Hnu: 4 ppm 108  
 α: 5 cpm  
 Bγ: 300 cpm

Hnu: 3221  
 α: ASI # 6  
 Bγ: ASI # 11

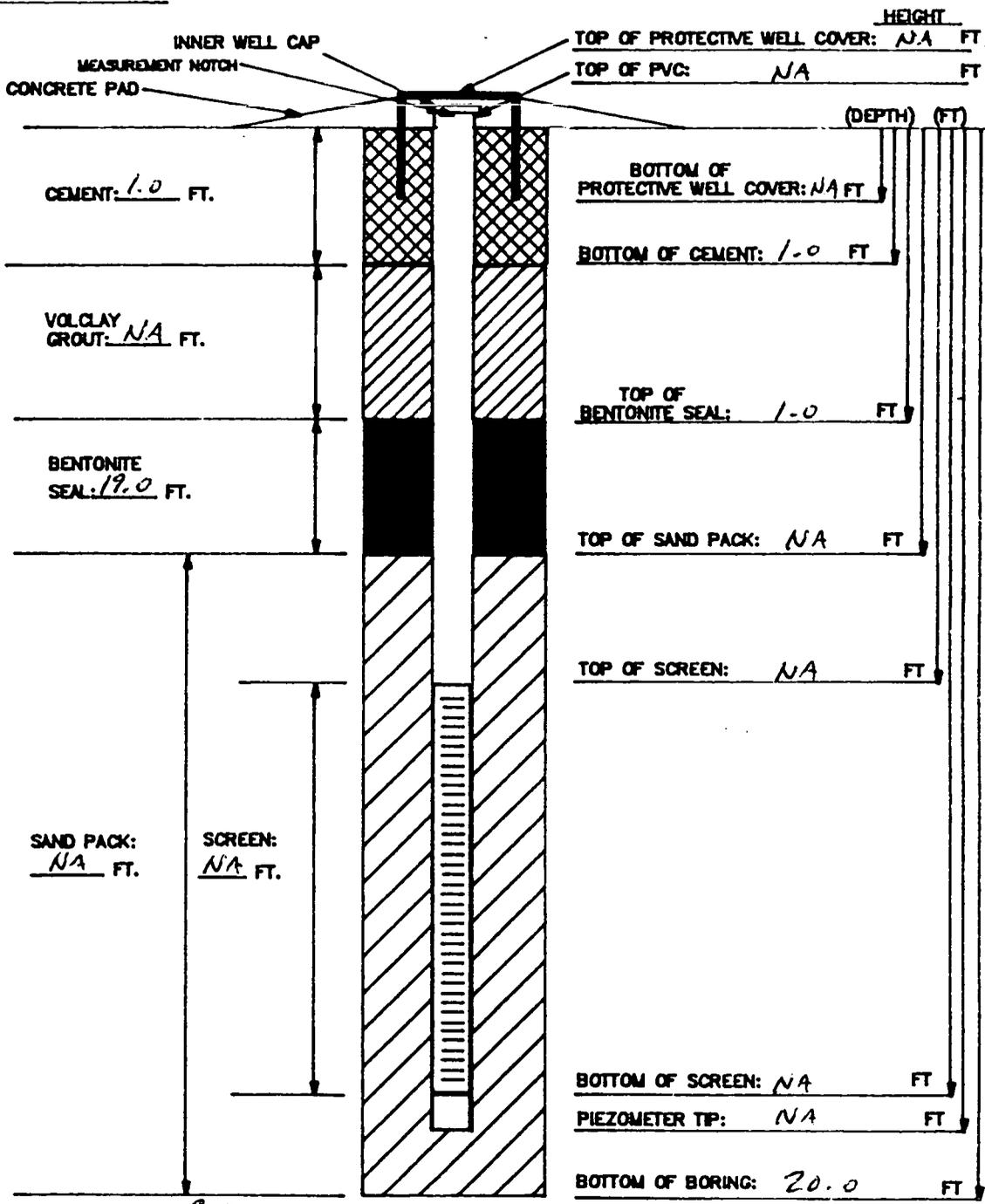
# FERNALD RI/FS

INSTALLATION DIAGRAM  
MONITORING WELL NO.

1503

INSTALLATION DATE: 7-2-90

1112



BOREHOLE DIAMETER: 8.0 INCHES

**MATERIALS USED:**

SAND TYPE AND QUANTITY: NA  
 BENTONITE PELLETS (5-GALLON BUCKETS): 3  
 BAGS OF VOLCLAY GROUT: NA  
 AMOUNT OF CEMENT: 1/2 BAG  
 AMOUNT OF WATER USED: 5 GAL  
 OTHER: NA

**NOTES:**

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

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TASK: 602 3.7

GEOLOGIST/ENGINEER: J. MASON

**PIEZOMETER INSTALLATION SHEET**

PROJECT NAME FMPD RI/FS FIELD ENG./GEO. J MASON DATE 7-2-90  
 PROJECT NO. 602 3.7 CHECKED BY S.T. DATE 7-31-90  
 BORING NO. 1503  
 PIEZOMETER NO. NA DATE OF <sup>PLUGGING</sup> INSTALLATION 7-2-90

**BOREHOLE DRILLING**

DRILLING METHOD <u>HOLLOW STEEL AUGER</u>	TYPE OF BIT <u>HOLLOW AUGER</u>
DRILLING FLUID (S) USED: FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u> FLUID <u>NA</u> FROM <u>NA</u> TO <u>NA</u>	CASING SIZE (S) USED: SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u> SIZE <u>NA</u> FROM <u>NA</u> TO <u>NA</u>

**PIEZOMETER DESCRIPTION**

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

**PROTECTION SYSTEM**

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

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (FT)		ELEVATION ( )	
	TOP	BOTTOM	TOP	BOTTOM
TOP OF RISER PIPE	<u>NA</u>			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	<u>NA</u>			
BOREHOLE FILL MATERIALS: GROUT / SLURRY / CEMENT BENTONITE SAND GRAVEL	TOP	<u>0.0</u>	BOTTOM	<u>1.0</u>
	TOP	<u>1.0</u>	BOTTOM	<u>20.0</u>
	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
PERFORATED SECTION	TOP	<u>NA</u>	BOTTOM	<u>NA</u>
PIEZOMETER TIP	<u>NA</u>			
BOTTOM OF BOREHOLE	<u>20.0</u>			
GWL AFTER INSTALLATION	<u>NA</u>			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES  NO   
 WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES  NO  110  
 REMARKS DRY HOLE - HOLE PLUGGED ON 7-2-90 WITH BENTONITE AND CAPPED WITH CEMENT

**VISUAL CLASSIFICATION OF SOILS**

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PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMPC RI/FS	
BORING NUMBER: 3396	COORDINATES:	DATE: 7-17-90
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth      Date/Time	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS		PAGE 5 OF 9

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWSON SAMPLER PER (IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (USF)	REMARKS
60	32917	9		DENSE, DARK GRAY (LOYA 411), SAND-SILT MIXTURE, SOME ROUNDED TO SUBROUNDED PEBBLES, SATURATED	SM	UA	H <sub>20</sub> = 0.0 ppm α = 0 cpm β <sub>γ</sub> = 30-40 cpm
61	1326 7-17	15 21	8				
62							
63							
64							
65	32918	21		VERY DENSE, DARK GRAY (LOYA 411), FINE GRAINED SILTY SAND, SOME SUBROUNDED PEBBLES, SATURATED	SM	UA	H <sub>20</sub> = 0.10 ppm α = 0 cpm β <sub>γ</sub> = 20-40 cpm
66	1405 7-17	28 33	7				
67							
68							
69							
70	32919	3		MEDIUM DENSE, GRAY (LOYA 511), SILTY FINE GRAINED SAND, SOME SUBROUNDED PEBBLES, SATURATED	SM	UA	H <sub>20</sub> = 0.0 ppm α = 0 cpm β <sub>γ</sub> = 30-40 cpm
71	1441 7-17	5 8	9				
72							
73							
74							
75							

**NOTES:**  
DRILLING CONTRACTOR: PENN DRILL CO.  
DRILLING EQUIPMENT: GULYRUS GRIE  
DRIVER: D. NEWMAN ASST.: B. JOHNSON

BACKGROUND  
H<sub>20</sub> = 0.0 - 0.20 ppm  
α = 0 cpm  
β<sub>γ</sub> = 20 - 50 cpm

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**VISUAL CLASSIFICATION OF SOILS**

PROJECT NUMBER: 602 3.2.1	PROJECT NAME: FMAX RI/FS		
BORING NUMBER: 3396	COORDINATES:	DATE: 7-18-90	
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 7-16-90
ENGINEER/GEOLOGIST: M. SWANSON	Depth	Date/Time	DATE COMPLETED: 7-19-90
DRILLING METHODS: CABLE TOOLS			PAGE 7 OF 9

DEPTH (FT)	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER 16 (IN)	RECOVERY (IN)	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (ITSF)	REMARKS
90	32923	19		DENSE, BROWN (LOAM SILT), WELL GRADED SANDY GRAVEL, SOME COBBLES AND SILT, SATURATED	GW	N/A	H <sub>25</sub> = 0.0 ppm α = 0.0 ppm β <sub>2</sub> = 40-60 cpm
91	1000 7-18	21 26	14				
92				BOTTOM OF BORING @ 91.5 FT. DRILLED AND SAMPLED TO 91.5 FT.			

**NOTES:**

DRILLING CONTRACTOR: PENN DRILL CO  
DRILLING EQUIPMENT: BENTONITE  
DRILLER: D. NEWMAN ASST.: B. JOHNSON

BACKGROUND

H<sub>25</sub> = 0.0 ppm  
 α = 0.0 ppm  
 β<sub>2</sub> = 40-60 cpm

# FERNALD RI/FS

1112

## PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS FIELD ENG./GEO. M. SWANSON DATE 7-16-90  
 PROJECT NO. 602 3.2.1 CHECKED BY E. Trollinger DATE 7-28-90  
 BORING NO. 3396  
 PIEZOMETER NO. 3396 DATE OF INSTALLATION 7-19-90

### BOREHOLE DRILLING

DRILLING METHOD <u>CABLE TOOLS</u>	TYPE OF BIT <u>HAMMER</u>
DRILLING FLUID (S) USED: FLUID <u>H<sub>2</sub>O</u> FROM <u>OFF</u> TO <u>91.5 FT</u> FLUID <u>-</u> FROM <u>-</u> TO <u>-</u>	CASING SIZE (S) USED: SIZE <u>10.0 ID</u> FROM <u>OFF</u> TO <u>90.0 FT</u> SIZE <u>-</u> FROM <u>-</u> TO <u>-</u>

### PIEZOMETER DESCRIPTION

TYPE <u>MONITORING WELL</u>	RISER PIPE MATERIAL <u>316 STAINLESS STEEL</u>
DIAMETER OF PERFORATED SECTION <u>4.0 ID</u>	RISER PIPE DIAMETERS: O.D. <u>4 3/8 in.</u> I.D. <u>4 in.</u>
PERFORATION TYPE: SLOTS <input type="checkbox"/> HOLES <input type="checkbox"/> SLOTTED SCREEN <input checked="" type="checkbox"/>	LENGTH OF PIPE SECTIONS <u>10 FT</u>
AVERAGE SIZE OF PERFORATIONS <u>0.010 in.</u>	JOINING METHOD <u>THREADED - FLUSH JOINTED</u>
TOTAL PERFORATED AREA <u>10 FT</u>	

### PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH <u>5 FT</u>	OTHER PROTECTION <u>HINGED, LOCKING</u>
PROTECTIVE PIPE O.D. <u>10.75 in.</u>	<u>LID COVER WITH PROXX</u>

ITEM	DISTANCE ABOVE / BELOW GROUND SURFACE (FT)		ELEVATION ( )		
TOP OF RISER PIPE	+ 2.0				
GROUND SURFACE	0.0				
BOTTOM OF PROTECTIVE PIPE	- 2.5				
BOREHOLE FILL MATERIALS:	GROUT / SLURRY	TOP 0.0	BOTTOM 63.0	TOP	BOTTOM
	BENTONITE	TOP N/A	BOTTOM N/A	TOP	BOTTOM
	SAND	TOP 63.0	BOTTOM 90.0	TOP	BOTTOM
	GRAVEL	TOP N/A	BOTTOM N/A	TOP	BOTTOM
PERFORATED SECTION	TOP 68 FT	BOTTOM 78.0 FT	TOP	BOTTOM	
PIEZOMETER TIP	80.0 FT				
BOTTOM OF BOREHOLE	91.5 FT				
GWL AFTER INSTALLATION	5.5 FT ON 7-19-90				

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

REMARKS TWO (2) BUCKETS OF BENTONITE ADDED AROUND PROTECTIVE CASING.

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