

**PLANS AND SPECIFICATIONS
REMEDIAL ACTION**

**Naval Ordnance Station
Site 5
Indian Head, Maryland**

Prepared For:

Environmental Engineering Branch
Chesapeake Division (Code 114)
Naval Facilities Engineering Command
Washington, D.C.

and

Air and Hazardous Waste Management Branch
Naval Ordnance Station
Indian Head, Maryland

Prepared By:

ABB ENVIRONMENTAL SERVICES, INC.
Washington, D.C.

Contract No. N62477-91D0043
Delivery Order No. 0001
Job No. 6942-00

March 10, 1992

BID SCHEDULE

SCHEDULE OF FIRM FIXED PRICE WORK

Price to perform work in accordance with all terms of this Contract.

Item No.	Item	Unit Price	Total Price
0001	Project Planning, Site Preparation, Mobilization/Demobilization, Waste Excavation and Handling, Solidification/Stabilization, Placement/Compaction/Covering, Restoration, and Demobilization.		
		<u>\$ Lump Sum</u>	<u>\$ _____</u>

SCHEDULE OF INDEFINITE QUANTITY WORK

Price to perform work in accordance with all terms of this Contract. The price of Contract Line Item 0002 is the sum of Subline Items 0002A through 0002B.

Item No.	Item	Max. Quantity	Unit Price	Total Price
0002A	Waste Excavation and Handling, Solidification /Stabilization, Placement/Compaction/Covering, and Restoration	<u>834 Tons</u>	\$ _____	\$ _____
0002B	Loading, Off-Site Transport and Disposal of Debris	<u>300 Tons</u>	\$ _____	\$ _____

TOTAL PRICE FOR SCHEDULE ITEM 0002
(ITEMS 0002A THROUGH 0002B)

\$ _____

TOTAL PROJECT PRICE FOR SCHEDULE ITEMS
0001 AND 0002

\$ _____

DATE: 9 MARCH 1992

PROJECT: Removal Action for Silver Contaminated Sediments
 LOACTION: NOS Indian Head, Maryland
 ENGINEER: ABB Environmental Services, Inc.

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
DIRECT COSTS				
TREATABILITY STUDY	1	LS	\$4,500.00	\$4,500
SITE PREPARATION				
FENCING				
4' SNOW FENCE	2757	LF	\$2.30	\$6,300
WARNING SIGNS	28	EA	\$29.00	\$800
CLEAR AND GRUB				
8"-12" DIAMETER TREES AND STUMPS	0.08	ACRE	\$13,269.00	\$1,100
<6" DIAMETER TREES	0.55	ACRE	\$12,144.00	\$6,700
<6" DIAMETER TREES/CONTAMINATED SEDIMEN	0.1	ACRE	\$36,432.00	\$3,600
DISPOSAL OF BRANCHES, LEAVES, STUMPS	650	CY	\$50.00	\$32,500
ESTABLISH ACCESS ROAD	1	LS	\$150.00	\$200
DECONTAMINATION PAD (1)				
GRADE	22	CY	\$5.00	\$100
SAND LAYER	12	CY	\$30.00	\$400
60 MIL FML	800	SF	\$2.00	\$1,600
ROUGH CARPENTRY	140	LF	\$2.20	\$300
ACCESS PATH	120	LF	\$6.60	\$800
SUMP PUMP AND ASSOCIATED HOISING	2	EA	\$200.00	\$400
TEMPORARY WATER STORAGE TRAILER	2	EA	\$1,400.00	\$2,800
UTILITY HOOKUPS				
TEMPORARY POTABLE WATER SUPPLY	22	25 FT	\$13.00	\$300
BACKFLOW PREVENTOR	1	EA	\$340.00	\$300
ELECTRIC HOOKUP	1	LS	\$1,000.00	\$1,000
TEMPORARY SEWER CONNECTION	16	25 FT	\$60.00	\$1,000
REMOVE DEBRIS FROM EASTERN STREAM				
REMOVE FROM DITCH	100	CY	\$8.50	\$900
HAUL TO DECON PAD AND DECON	100	CY	\$3.75	\$400
DISPOSAL OF ABOVE ITEMS	100	CY	\$50.00	\$5,000
ROLL BACK EXISTING FENCE (WESTERN STREAM)	1	LS	\$75.00	\$100
ESTABLISH STAGING AREA				
GRADE	370	CY	\$3.00	\$1,100
CRUSHED STONE SURFACE	204	CY	\$30.00	\$6,100
ESTABLISH STOCKPILE AREA				
GRADE	15	CY	\$5.00	\$100
SAND SURFACE	8	CY	\$30.00	\$200
60 MIL FML	400	SF	\$2.00	\$800

DATE: 9 MARCH 1992

PROJECT: Removal Action for Silver Contaminated Sediments

LOCATION: NOS Indian Head, Maryland

ENGINEER: ABB Environmental Services, Inc.

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL

NON-CONTACT COOLING WATER DIVERSION FROM BUILDING 731				
CONSTRUCT RETENTION PIT (2)				
EXCAVATE PIT	20	CY	\$16.20	\$300
SAND LAYER	80	CY	\$30.00	\$2,400
60 MIL FML	160	SF	\$2.00	\$300
LEVEL-ACTUATED SUMP PUMP	2	EA	\$150.00	\$300
TEMPORARY WATER LINE TO VOEGELI ROAD	18	25 FT	\$13.00	\$200
REMOVAL OF EASTERN STREAM CULVERT				
REMOVE TOPSOIL	1.9	CY	\$2.62	\$0
DECONTAMINATE PIPE/DISPOSE OF PIPE	2.5	CY	\$50.00	\$100
SURFACE WATER RUNOFF CONTROL - SILT FENCE				
	1130	LF	\$1.07	\$1,200
MOBILIZE TREATMENT EQUIPMENT (3)				
	1	LS	\$5,000.00	\$5,000
CONTAMINATED SOIL HANDLING				
EXCAVATE SEDIMENTS	1077	CY	\$2.62	\$2,800
HAUL SEDIMENTS TO TREATMENT AREA	1077	CY	\$3.13	\$3,400
LOAD INTO TREATMENT UNIT	1077	CY	\$9.85	\$10,600
SOIL PROCESSING USING S/S				
	1077	CY	\$60.00	\$64,600
SAMPLING OF TREATED SOIL				
TCLP METALS	12	SAMPLE	300	\$3,600
MODIFIED PROCTOR (ASTM D-1557)	6	SAMPLE	250	\$1,500
SAMPLING OF DECONTAMINATION WASTEWATER				
BOD	10	SAMPLE	\$45.50	\$500
TSS	10	SAMPLE	\$17.50	\$200
SILVER	10	SAMPLE	\$18.50	\$200
PLACEMENT OF TREATED SOIL (ALL THREE LIFTS)				
HAUL TREATED SOIL TO PLACEMENT AREA (4)	1240	CY	\$4.19	\$5,200
SPREAD AND COMPACT TREATED SOIL	1240	CY	\$3.63	\$4,500
1 FT. SOIL COVER (AFTER LAST LIFT)				
AQUIRE SOIL	400	CY	\$20.00	\$8,000
SPREAD AND COMPACT	400	CY	\$3.63	\$1,500
BACKFILL EXCAVATED DITCHES				
BACKFILL	1077	CY	\$19.50	\$21,000
JUTE THATCHING	2015	SY	\$1.00	\$2,000

DATE: 9 MARCH 1992

PROJECT: Removal Action for Silver Contaminated Sediments

LOCATION: NOS Indian Head, Maryland

ENGINEER: ABB Environmental Services, Inc.

DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL
REVEGETATE CLEARED AREAS ADJACENT TO STREAMS	0.0154	MSF	\$42.50	\$0
SITE CLEANING				
DEMOBILIZATION	1	LS	\$5,000.00	\$5,000
REMOVE AND DISPOSE OF SAND	14	CY	\$50.00	\$700
REMOVE AND DISPOSE OF GRAVEL	204	CY	\$57.00	\$11,600
REMOVE AND DISPOSE OF FML	1	LS	\$300.00	\$300
REINSTATE FENCE ACCROSS WESTERN STREAM	1	LS	\$75.00	\$100
SUBTOTAL DIRECT COSTS				\$236,500
INDIRECT COSTS				
HEALTH AND SAFETY (@ 5%)				\$11,800
LEGAL, ADMINISTRATIVE, PERMITTING COSTS (@ 5%)				\$11,800
ENGINEERING (@ 10%)				\$23,700
SUBTOTAL INDIRECT COSTS				\$47,300
CONTINGENCY (@10%)				\$5,000
TOTAL COST				\$288,800

NOTES:

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The views, opinions, and/or information contained in this document are those of the authors and should not be construed as an official Department of the Navy position, policy, or decision, unless so designated by other documentation.

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REMEDIAL ACTION**

**Naval Ordnance Station
Site 5
Indian Head, Maryland**

TABLE OF CONTENTS

SECTION	TITLE
SECTION I	TECHNICAL SPECIFICATIONS
DIVISION 1	GENERAL REQUIREMENTS
01012	Remedial Action Summary of Work
01030	Remedial Action Special Project Procedures
01060	Remedial Action Regulatory Requirements
01150	Remedial Action Measurement and Payment
01410	Remedial Action Sampling and Analysis
01510	Remedial Action Temporary Facilities
01710	Remedial Action Site Maintenance
01712	Remedial Action Mobilization/Demobilization
01721	Remedial Action Project Record Documents
DIVISION 2	SITE WORK
02081	Remedial Action Off-site Transportation
02082	Remedial Action Off-site Disposal
02100	Remedial Action Site Preparation
02205	Remedial Action Waste Excavation
02221	Remedial Action Drainage Ditch Restoration
02240	Remedial Action Solidification/Stabilization
SECTION II	DESIGN SKETCHES
Figure 1	Site Map with Delineation of Excavation Zones
Figure 2	Detail of Utilities in Vicinity of Excavation Zones
Figure 3	Cross-Sectional Views of Explosion Berm Extension and Placement of Treated Materials
Figure 4	Cross-Section View of Excavation
Figure 5	Typical Jute Thatching Installation
APPENDIX A	Soils/Sediments Characterization Data Site Geotechnical Data

SECTION 1
TECHNICAL SPECIFICATIONS

SECTION 01012

REMEDIAL ACTION SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

The remedial action site (Site 5) is comprised of two drainage ditches emanating from the southwest-facing corners of Building 731, Naval Ordnance Station, Indian Head, MD, which have been impacted by past photographic waste management practices originating within the building. These practices have resulted in elevated silver concentrations within ditch soils/sediments. Portions of the drainage ditch are within areas designated for a military construction project (MILCON P-059) and a segment of the ditch network lies in an area scheduled for expansion of an existing explosion berm. The Navy has elected to remediate the manmade segments of the drainage ditch network through excavation of soils/sediments exhibiting silver concentrations greater than 10 mg/kg, treatment of the excavate utilizing solidification/stabilization technology, followed by long-term on-site management through incorporation of the treated material within the on-site explosion berm expansion as shown in the Design Sketches.

In 1991, sediment/soil samples from the two drainage ditches were acquired and tested for total silver, cyanide, and TCLP metals. TCLP tests performed on these samples indicate that the sediments and soils, in their present condition and position, are not characteristic hazardous wastes. Silver concentrations in the sediments range from 571 milligrams per kilogram (mg/kg) to below the method detection limit of approximately 2.5 mg/kg. Analytical data, along with sampling locations from the 1991 sampling events, are provided as Appendix A, Soils/Sediments Characterization Data.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Special Projects Procedures: Section 01030
- Contractor Quality Control: Section 01400
- Environmental Protection: Section 01560

1.3 REMEDIAL ACTION

1.3.1 Scope of Work: The work items included in this project which the Contractor will be required to perform include, but are not limited to, the following:

1.3.1.1 Remediation Work Plan (SD-94): The Contractor shall develop and submit to the Government Representative a remediation work plan which defines project tasks, the procedures to accomplish them, along with schedules; remediation-specific quality assurance/quality control systems and procedures; as well as health and safety, environmental protection, contingency, and security project components. The plan will serve as the defining document for all remediation activities associated with Site 5. The specific submittals associated with the plan are fully outlined in Section 01030, Remedial Action Special Project

Procedures. All submittals required of the Contractor are listed in Section 01721, Project Record Documents.

1.3.1.2 Permits and Approvals:

The Contractor shall obtain all federal, state, and local permits required to execute the remediation project. These permitting requirements include the following:

- The Contractor shall prepare an Erosion and Sediment Control Plan, in accordance with MDE-COMAR 08.05.01, and provide any other relevant information, within a span of time such that she/he will not delay the Construction Contractor from applying for the Erosion and Sediment Control Permit. The Construction Contractor (not to be confused with "Contractor") is contracted under the terms of the specification entitled "Mix, Assemble and Cure Facility at the Naval Ordnance Station, Indian Head, Maryland." In Section 01560 of that specification, Environmental Protection, the Construction Contractor is required to prepare an Erosion and Sediment Control Plan in accordance with MDE-COMAR 08.05.01. Only a single permit shall be applied for. The issued permit shall validate work activities for all phases of the project, including the remediation-related activities as specified here.
- Permits for solid waste disposal and hazardous waste disposal, as specified in Section 01560, Environmental Protection.

The Contractor shall obtain approval of the Remediation Work Plan from the Government Representative and any other agency specified by the Government Representative prior to initiation of site work. Additional approvals include, but are not limited to:

- excavation beyond the specified dimensions and volumes as specified in Section 02205 and in the design sketches;
- acceptance of the solidification/stabilization design mix shall be required from the Government Representative prior to initiation of any Site treatment, as defined in Section 02240;
- acceptance of treated and placed materials as defined in Section 02240.
- certification that an off-site landfill will accept remediation-generated debris as specified in Section 02082.

1.3.1.3 Mobilization and Site Preparation:

Utilities: The Government will supply a fresh water source and electricity source. The Facility's sewage system shall be available for the discharge of approved liquid wastes. The Contractor is responsible for supplying and installing any lines, valves, and other equipment necessary to access these utilities.

Security: A fence shall be installed around the areas to be cleared and excavated as shown in the design sketches. This barrier shall encompass the exclusion zones around the two drainage ditches and access to the zones shall be provided through gates adjacent to the dirt road, as specified in the design sketches. The gates shall be locked outside of the hours of operation. The Contractor shall control access by requiring all personnel entering or leaving the site to sign in and out.

Access Roads/Routes: The primary site access road is the existing dirt road, as shown on the design sketches. The Contractor will be required to construct access routes along each side of both drainage ditches to allow excavation equipment access from the dirt road. These routes shall consist of

approximately fifteen-foot wide cleared paths that are immediately adjacent to the ten-foot wide section of the streambed that is to be excavated. Since the excavation zone for the ditches is approximately ten feet wide, the portions of both ditches that are to be excavated will lie in the center of a 40-foot wide cleared area, twenty feet on each side from the center of the ditch. Additionally, an access route immediately east of the eastern stream's cleared area will need to be constructed, to allow truck access from the dirt road to the staging/decontamination area. Construction of these access routes will require clearing and grubbing of vegetation and removal of debris from within and around the drainage ditches. The routes should be properly graded to prevent stormwater from ponding within the routes, and to prevent other conditions that may impede the access of vehicles or the progress of work.

Support Facilities: The Contractor shall mobilize support facilities and other appropriate structures in areas designated within the design sketches. These facilities include:

- Personnel decontamination facility;
- Solid waste dumpster.

Decontamination Facility (Personnel): The Contractor shall provide a personnel decontamination facility for use by the Contractor's personnel and others visiting the site. The facility shall include a changing room, lockers, and showers. The specific requirements are outlined in Section 01510, Remedial Action Temporary Facilities.

Decontamination Facility (Equipment): A decontamination facility for vehicles and equipment leaving the exclusion zone shall be constructed by the Contractor. The dimensions of the facility and the size of the holding/solids separation tank shall be determined by the Contractor based on the type and size of the vehicles and equipment proposed for use. The plans for the decontamination facility shall be approved by the Government Representative prior to construction. The specific requirements for the facility are outlined in Section 01510, Remedial Action Temporary Facilities.

Exclusion Zone: The Contractor shall establish an exclusion zone within the fenced area. This zone shall include the excavation area, any staging and stockpile areas, the treatment area, and the area designated for placement of treated material and expansion of the existing explosion berm. Entrance to the exclusion zone shall only be through the personnel and vehicle decontamination zones.

Diversion of Surface Water Flow: As specified in Section 02205 and in the design sketches, the Contractor shall divert the course of waters contributing to the flow of the two contaminated drainage ditches. These waters may consist of non-contact cooling waters, which are discharged in small quantities from Building 731, and condensation discharge from the steamline that runs through the site.

Contaminated Soils/Sediments Staging Area: The Contractor shall construct a storage area for contaminated soils/sediments should the proposed treatment method require stockpiling or dewatering of excavate. The location of, and the procedures employed in the area shall be included in the Remedial Action Work Plan and be approved by the Government Representative prior to construction.

Treatability Testing: The Contractor shall implement a testing program which shall be defined within the Remediation Work Plan. The program shall use representative site soil/sediment samples to develop and optimize the solidification/stabilization design mix. This program shall include bench-scale testing to evaluate the physical, chemical, and geotechnical properties of the untreated and treated materials. The Contractor shall utilize site samples taken from areas exhibiting:

- (1) high, low and representative silver concentrations;
- (2) high, low and representative organic content; and
- (3) high, low and representative clay content.

Specific requirements for treatability testing are identified in Section 02240.

1.3.1.4 Waste Excavation and Handling: The Contractor shall excavate silver-contaminated soils/sediments from the zone defined within the design sketches and Section 02205. Confirmatory sampling, as described in the following subsection, will be conducted by the Government Representative to ensure attainment of target cleanup levels. As necessary, the Government Representative may direct the Contractor to excavate additional soils/sediments to attain the target cleanup level. All excavated materials shall be handled in such fashion as to prevent the release of the excavate to the environment, and to minimize impacts to the adjacent forest, forest floor, or vegetation. Contaminated soils/sediments shall be loaded directly into leak-proof containers which shall be promptly removed to the Excavate Stockpile/Storage Area or the Treatment Area. Any subsequent handling of the soils/sediments, such as consolidation or dewatering, will occur at the appropriate area. Section 02081, Remedial Action Off-site Transportation and Section 02082, Remedial Action Off-site Disposal delineate requirements for any necessary off-site disposal.

1.3.1.5 Remediation Sampling Program: Remedial action-related sampling activities fall into the following categories:

- **Target Level Sampling During Excavation:** Subsequent to excavation of the specified dimensions and volumes of the streambed sediments (Section 02205), confirmatory samples of the unexcavated sediments will be acquired by the Government Representative, to ensure that remaining soils and sediments have silver concentrations of 10 mg/kg or less. Silver concentration analytical results shall be made available to the contractor no later than 24 hours after the time of sample acquisition. These data will be used by the Government Representative to direct any additional excavation.
- **Treatment-Related Sampling:** The contractor shall acquire samples of the treated soils and sediments prior to their placement in the area of the proposed explosion berm. Acceptance testing shall be performed on each of the samples to ensure that: (1) treated materials meet physical geotechnical requirements as specified in Section 02240; and (2) silver in the treated material is not leachable, and will therefore remain immobile within the berm structure. Testing of the placed/treated material shall be completed as specified in Section 02240.
- **Wastewater-Related Sampling:** Samples of all wastewater that is: (1) used during decontamination procedures; or (2) extracted from the excavation, untreated material, the solidified/stabilized mixture of treated soils/sediments shall be taken and analyzed by the Contractor. Silver concentrations must be 1 milligram per liter (mg/l) or less to discharge into the Facility's sewage system. Wastewater to be discharged into the Facility's sewage system may not have biochemical oxygen demand (BOD) levels of greater than 200 mg/l, or total suspended solids (TSS) levels above 30 mg/l. Wastewater not meeting these requirements shall be pretreated to achieve the specified standards or disposed of off-site in an acceptable fashion. The Contractor shall provide analytical results to the Government Representative within 24 hours of sampling and obtain approval prior to discharge to the Facility's sewage system.

1.3.1.6 Solidification/Stabilization: The Contractor shall implement treatment of the excavated material using a contained treatment system. Any treatment process utilizing in-situ or on-ground mixing will not be allowed. All operations shall be implemented within appropriate tanks or vessels and shall be specified within the Remediation Work Plan. Treatment shall be initiated employing the accepted design mix which demonstrates the ability to meet explosion berm construction material/performance requirements including load-bearing and compactability characteristics as well as exhibiting acceptable

TCLP leachability characteristics (levels of silver and other heavy metals in leachate below detection limits). Treatment shall be conducted in a manner which minimizes the potential for release of contaminated material to the environment. Sampling shall be conducted by the Contractor and the Government Representative throughout the treatment process to ensure that the treated material meets specified requirements. Specific requirements pertinent to planning and execution of solidification/stabilization are delineated in Section 02240.

1.3.1.7 Placement/Compaction/Capping of Treated Material: Subsequent to treatment, the Contractor shall place and compact the solidified/stabilized material in the area designated within the design sketches and in a manner delineated in Section 02240, Remedial Action Solidification/Stabilization. Prior to placement, all site preparation activities associated with construction of the explosion berms (e.g., subgrade preparation) shall be completed. The Contractor shall place and compact the S/S material in 6 inch lifts on suitable subgrade. The final layer of solidified material shall be uniformly graded to provide an appropriate base for a 1 foot thick soil cap as shown in the design sketches. The Contractor will place, compact, and fine-grade the soil cap subsequent to S/S and placement/compaction of the excavate and remediation-contaminated material.

1.3.1.8 Sorting/Management of Debris: Debris generated through site preparation, excavation, or pretreatment processes which is not contaminated by presence on the site, shall be removed and transported to a disposal facility licensed to accept the debris, as specified in Sections 02081 and 02082. Debris in contact with silver-contaminated soils/sediments shall be properly decontaminated and transported to an approved solid waste disposal facility. All silver-contaminated soils/sediments shall be treated and incorporated into the expanded explosion berm. The technical specification for debris sorting and disposal is located in Section 02205, Remedial Action Waste Excavation.

1.3.1.9 Ambient Air Monitoring: The Contractor shall conduct operations (excavation, treatment, etc.) such as to minimize the generation of dust and other airborne contaminants. In addition, the Contractor shall perform real-time exclusion zone monitoring for total dust in the ambient air. The concentration of silver in air shall be determined by applying correlation factors, which are based on silver concentration measurements of soil/sediment samples available from the immediate zone of excavation (Appendix A). Provisions and procedures to accomplish this shall be delineated in the Remedial Action Work Plan; details of the requirements of this plan are presented in Section 01030, Special Project Procedures.

1.3.1.10 Restoration/Demobilization:

Removal of Material Storage/Staging and Decontamination Areas: At the completion of the project, the Contractor shall remove all constructed support areas. All waste materials shall be disposed of in an appropriate manner and areas restored to contours and conditions as specified in the Mix, Assemble, and Cure Facility Specifications as shown in the design drawings.

Restoration of the Drainage Ditch Network: The excavation area shall be backfilled and graded to contours consistent with those specified in the design drawings, with the exception of the zone designated for expansion of the existing explosion berm. The drainage ditch network shall be rerouted along the perimeter of the expanded berm as shown in the Design Drawings. The soil backfill material shall be of a quality similar to that existing naturally at the site. The top six inches of soil backfill shall be of a quality suitable to support a grass cover crop and shall be relatively free of stones greater than 2 inches in diameter and deleterious matter. Jute matting or other appropriate technique shall be utilized to prevent erosion within the restored drainage ditches. The restoration shall be completed in accordance with specifications outlined in Section 02221, Remedial Action Drainage Ditch Restoration.

Revegetation: Areas disturbed by the remedial action shall be fertilized and seeded according to Section 02930, Turf at the completion of backfilling, compaction, and grading.

Removal of Equipment, Field Office/Laboratory, and Fencing: The Contractor shall remove from the Facility all equipment, support facilities, and fencing installed to execute the remedial action. The treatment system shall not be removed until all contaminated soils/sediments from the excavated ditches and all other on-site support systems (e.g. decontamination and staging areas, and any other areas receiving silver-contaminated soils and sediments through any Remedial Action activity) have been treated and incorporated into the explosion berm.

Restoration of Access Road/Route Areas: Access roads/routes constructed during the remedial action will be restored to conditions prior to construction unless otherwise directed by the Government Representative.

1.3.2 Objectives: The objectives of the remedial action at Site 5 include: the removal of soils/sediments contaminated with silver at concentrations greater than 10 mg/kg from the manmade sections of the drainage network; treatment of the excavate using solidification/stabilization technology to produce a material which meets the physical/chemical requirements of explosion berm construction material and which maintains the immobility of silver as it exists currently in the sediments. TCLP analyses of 1991 samples exhibited silver in the test leachate at levels below method detection limits (see Appendix A). The solidified/stabilized material must also exhibit acceptable silver concentrations in TCLP testing procedures (below TCLP method detection limits for heavy metals). Placement, compaction, and capping of the treated excavate within the zone designated for Site 5 explosion berm expansion is to be performed as delineated in Section 02240, Remedial Action Solidification/Stabilization, and as shown in the according design sketches.

1.4 WORK SEQUENCE

The remediation of contaminated soils/sediments associated with the manmade drainage ditches emanating from Building 731 will be implemented during, and as part of, the construction of a Mix, Assemble and Cure Facility at Naval Ordnance Station, Indian Head, MD. Remediation work shall be coordinated and properly sequenced with Facility construction tasks.

END OF SECTION

SECTION 01030

REMEDIAL ACTION SPECIAL PROJECT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION:

1.1.1 Special Project Procedures are required of the Contractor due to the conditions at the site. Special Project Procedures are required for the following:

- Health and Safety
- Spill Control
- Dust Control
- Runoff Control
- Air Quality Control
- Remediation-Related Wastewater Control
- Quality Control

1.1.2 These procedures shall meet the requirements of the National Oil and Hazardous Substances Contingency Plan (NCP).

1.1.3 Contractor is required to certify that the Contractor's employees are properly trained to perform the work required by this remedial action contract prior to commencement of any site work, per the regulations specified in the References paragraph of this specification.

1.1.4 All plans specified in this section shall be components of the Remedial Action Work Plan.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Environmental Protection: Section 01560
- Remedial Action Summary of Work: Section 01012
- Remedial Action Regulatory Requirements: Section 01060
- Remedial Action Project Record Documents: Section 01721

1.3 REFERENCES

- Occupational Safety and Health Administration (OSHA) Standards for General Industry, 29 CFR 1910, and Standards for the Construction Industry, 29 CFR 1926.
- OSHA Standards for Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120.
- OSHA Standards for Ambient Air Quality, 29 CFR 1910.1000.

- National Institute for Occupational Safety and Health (NIOSH), OSHA, the U.S. Environmental Protection Agency (EPA), and the U.S. Coast Guard, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", October 1985.
- Corps of Engineers (COE) Safety and Health Requirements Manual, EM 385-1-1 (April 1981, rev. October 1987).
- State of Maryland Sediment and Erosion Control Regulations, MDE-COMAR 08.05.01.

1.4 SUBMITTALS

1.4.1 Health and Safety, Spill Control, Dust Control, and Runoff Control Plans:

1.4.1.1 Submit plans for implementing these procedures for approval to the Government Representative and for review and comment to appropriate regulatory agencies. These plans shall be incorporated into the Remediation Work Plan. No work on-site will be permitted until the comments received from the regulatory agencies are adequately addressed by the Contractor, and the plans are approved by the Government Representative. The Contractor will be given no extension in time for delays caused by the Contractor's failure to address all comments adequately in a second submittal.

1.4.1.2 The approved plans, complete with all comments addressed, shall be made a part of the Remediation Work Plan. The Contractor shall implement and maintain these procedures at the appropriate time prior to and during performance of the remedial action work. Failure to adhere to these plans will give the Government Representative the right to issue a stop work order. The Contractor shall not be entitled to a time extension for such an action.

1.4.2 Air Monitoring Plan: The Contractor shall submit, to the Government Representative, a plan detailing the provisions and procedures for full-shift air monitoring during remedial activities. This plan will become a component of the Remediation Work Plan.

1.4.3 Contractor's Certification: Certify in writing to the Government Representative prior to beginning work that employees working pursuant to this Contract are properly trained for this type of work and that training, as a minimum, is in compliance with OSHA 1910.120. A roster of trained personnel shall be provided for the Government Representative.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 HEALTH AND SAFETY

3.1.1 The Health and Safety Plan shall conform to the requirements of 29 CFR 1910 which includes, but is not limited to, the following:

- The name of a site health and safety officer and the names of key personnel and alternates responsible for site safety and health.
- A health and safety risk analysis for existing site conditions, and for each site task and operation.
- Employee training assignments.
- A description of personal protective equipment to be used for each site task and operation.

- Medical surveillance requirements.
- A description of the frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used.
- Site control measures and work zones.
- Decontamination procedures.
- Standard operating procedures for the site.
- Buddy system.
- Excavation Safety.
- Heat and Cold Stress Prevention and Response.
- An emergency contingency and response plan that meets the requirements of 29 CFR 1910.120.
- A roster of trained and certified personnel allowed on-site.

3.1.2 A continuous monitoring program shall be required to indicate conformance to the approved Health and Safety Plan. A certified industrial hygienist, with a minimum of two years of air-monitoring-related experience, shall be on-site full time during all remedial activities to monitor potential exposure per requirements outlined in this specification, and as required by federal, state, or local regulation.

3.2 SPILL CONTROL

3.2.1 The Contractor shall develop, implement, maintain, and oversee a comprehensive spill and discharge control plan. This plan shall provide contingency measures for on-site or off-site spills or discharges from handling, staging, or transport of potentially hazardous materials.

- If a spill of any size occurs, the Contractor shall immediately notify the Government Representative and the Facility's Air and Hazardous Waste Management Branch (301-743-6745/6746) and implement the spill/discharge control plan. A Spill Report shall be provided to the Government Representative identifying, as a minimum, the cause and extent of the spill, any resulting contamination danger, and corrective actions taken.
- The Contractor shall provide methods, means, and facilities required to prevent contamination of soil, water, atmosphere, uncontaminated structures equipment, or material by the discharge of wastes from spills due to the Contractor's operations.
- The Contractor shall provide equipment and personnel to perform emergency measures required to contain any spills and to remove spilled materials and soils or liquids that become contaminated due to spillage. This collected spill material shall be properly disposed of at the Contractor's expense.
- The Contractor shall provide for any unexpected spills or discharges with the following minimum equipment to be kept on-site at all times during site activities:
 - (a) Noncombustible absorbent.
 - (b) Front-end loader.
 - (c) Drums (55-gallon U.S. DOT 17-E or 17-H).
 - (d) Shovels.
- Take immediate measures to control and contain the spill within the site boundaries. This shall include the following actions:
 - (a) Isolate and contain hazardous spill areas.
 - (b) Deny entry to unauthorized personnel.

- (c) Do not allow anyone to touch spilled material.
 - (d) Stay upwind; keep out of low areas.
 - (e) Keep combustibles away from the spilled material.
 - (f) Use water spray to reduce vapors and dust, as needed.
 - (g) Take samples for analysis to determine that cleanup is adequate.
 - (h) Other actions, as needed.
- The Contractor shall absorb all liquid spills with noncombustible absorbent material, and dispose of the absorbent/spill mixture in the manner specified above.
 - If a discharge of any material stored in drums occurs, the Contractor shall take the following actions to reduce potential migration to adjacent properties:
 - (a) Contain and eliminate the discharge, if possible.
 - (b) Remove or retrieve any discharged liquids, if possible.
 - (c) Isolate the hazardous area and deny entry to unauthorized personnel.
 - (d) Do not allow anyone to touch the discharge materials.
 - (e) Other actions, as needed.
 - For liquid discharges to soil, the Contractor shall immediately identify the point of discharge, and take measures to eliminate further spills. The discharged material shall be absorbed with a non combustible absorbent material, specifically designed for the absorption of potentially hazardous wet wastes, and the absorbent/discharge mixture shall be placed into dry containers.
 - Decontamination procedures may be required after cleanup to eliminate traces of the substance spilled or reduce it to an acceptable level as determined by the Government Representative. Complete cleanup may require removal of contaminated soils. Personnel decontamination shall include showers and cleansing, or disposal of clothing and equipment. All contaminated materials including cloth, soil, and wood that cannot be decontaminated shall be properly containerized, labeled, and disposed of as soon as possible.

3.3 DUST CONTROL

3.3.1 Requirements: The Dust Control Plan, shall at a minimum:

- Assign one individual, supervised by the Contractor Site Health and Safety Officer, whose responsibility is to prevent migration and blowing of dust (especially contaminated or potentially contaminated dust).
- Require that any water be applied by methods approved by the Government Representative with equipment including a tank, pressure pump, and a nozzle equipped spray bar.
- Require that any water will be applied in a manner which will not cause runoff, ponding, muddy conditions, or result in soil erosion.
- Require all excavated and stockpiled soils be kept wet to avoid dust.
- Require necessary actions to prevent dusting during and construction activities.

3.3.2 Implementation: The Contractor shall be responsible for dust control at the site. The Contractor assumes responsibility for any contract delays or work stoppages for use of inappropriate or ineffective dust control measures.

3.3.3 Materials required: Water shall not be salty or brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

3.4 RUNOFF CONTROL

3.4.1 Requirements: The Runoff Control Plan, shall at a minimum:

- Prevent runoff from contaminating other soils and prevent off-site runoff from entering open excavations.
- Assign one individual whose responsibility is to prevent runoff from decontamination pad during decontamination activities.
- Obtain Government Representative Approval for implementing alternate runoff control measures.

3.4.2 Implementation: The Contractor shall perform each of the following:

- The Contractor shall collect rainwater and decontamination washwater from the decontamination pad. The Government Representative will perform required testing analyses on the collected water, with a maximum 24-hour turnaround time. No more than 1000 gallons of contained wastewater may be stored at the Facility at any one time. The maximum storage time for contained water shall be 48 hours.
- All collected wastewater from the decontamination pad that yields samples with a silver concentration of 1 mg/l or less, BOD of 200 mg/l or less, and TSS of 30 mg/l or less, may be discharged into the Facility's sewage system. The Contractor shall furnish and install all pipes, valves, pumps, and other equipment necessary for proper discharge of wastewater.
- If the analytical results indicate that silver, BOD, and/or TSS levels in the contained water are greater than the levels specified above, the Contractor shall: (1) pretreat to the specified standards for discharge to the Facility's sewage system; or (2) dispose of the wastewater off-site in an acceptable manner. The Contractor shall submit, as part of the Work Plan, a proposed method for pretreatment of collected wastewaters that exceed the Station-imposed standards listed below.
- Maintain water level in collection area that will not result in water overflow from storm events or other activities.

3.5 AIR QUALITY CONTROL

3.5.1 Implementation:

The Contractor shall conduct operations (excavation, treatment, etc.) such as to minimize the generation of dust and other airborne contaminants. In addition, the Contractor shall perform real-time monitoring for total dust in the ambient air in exclusion zones. The Contractor shall use mini-ram to determine particulate concentrations in air. The concentration of silver in air shall be determined by applying correlation factors, which are based on silver concentration measurements available from soil/sediment samples acquired from the immediate zone of excavation. The analytical data produced from the 1991 sampling events shall be used to determine silver concentrations in the zones being excavated.

When excavating sediments and soils from the drainage ditch to the east of Building 731, two different correlation factors will be used, depending on which segment of the ditch is undergoing remediation activities.

- For the segment of the ditch that is upstream of the proposed explosion berm's location, the correlation factor will be based on a concentration of silver in soils/sediments of 122 mg/kg. This number is the average of the analytical results from the 0-inch below-ground-surface (bgs) samples taken from the upstream segment.
- For the segment of the ditch that is within and downstream of the proposed explosion berm's location, the correlation factor will be based on a concentration of silver in soils/sediments of 38 mg/kg. This number is the average of the analytical results from the 0-inch bgs samples taken from within the berm area.

When excavating sediments and soils from the drainage ditch to the west of Building 731, one correlation factor will be used. The correlation factor shall be based on a concentration of silver in soils/sediments of 151 mg/kg. This number is the average of the analytical results from the 0-inch bgs samples taken from the upstream segment of the drainage swale.

Real-time ambient air monitoring shall be performed by a certified industrial hygienist, with a minimum of two years of air-monitoring-related experience, during all remedial excavation and treatment activities. The OSHA Permissible Exposure Limit (PEL) for silver in air is 0.01 milligrams per cubic meter (mg/m^3); dust-reducing engineering controls shall be initiated if air monitoring analyses indicate that silver concentrations in air within the exclusion zone will exceed an eight-hour time weighted average of $0.01 \text{ mg}/\text{m}^3$.

3.6 REMEDIATION-RELATED WASTEWATER CONTROL

3.6.1 Implementation:

- The Contractor shall collect rainwater and decontamination washwater from the decontamination pad, and any water extracted during the excavation and solidification/stabilization processes. The Contractor shall perform required testing analyses on the collected water, with a maximum 24-hour turnaround time. No more than 1000 gallons of contained wastewater may be stored at the Facility at any one time. The maximum storage time for contained water shall be 48 hours.
- All collected wastewater from the decontamination pad that yields samples with a silver concentration of 1 mg/l or less, BOD of 200 mg/l or less, and TSS of 30 mg/l or less, may be discharged into the Facility's sewage system. The Contractor shall furnish and install all pipes, valves, pumps, and other equipment necessary for proper discharge of wastewater.
- If the analytical results indicate that silver, BOD, and/or TSS levels in the contained water are greater than the levels specified above, the Contractor shall: (1) pretreat to the specified standards for discharge to the Facility's sewage system; or (2) dispose of the wastewater off-site in an acceptable manner.

3.7 QUALITY CONTROL

3.7.1 See Section 01400: Contractor Quality Control (CQC) System.

3.8 WEATHER CONSTRAINTS

3.8.1 The Contractor shall halt all remediation-related activities in the event of a storm with precipitation and/or winds strong enough to permit air- or water-borne migration of silver-contaminated soils/sediments. Other protective measures shall be implemented in the event of a storm in accordance with the Mix, Assemble and Cure Facility Technical Specifications, Additional General Paragraphs, Section 01011, paragraph 2.5.4.

3.9 CONTRACTOR'S CERTIFICATION

3.9.1 Certify in writing that all employees working pursuant to this contract are properly trained for this type of work.

3.9.2 This certification shall state that:

- All employees are current in their training for that level required by their job function and responsibility, as required by 29 CFR part 1910.
- The individual who signs the certification of training on behalf of the Contractor had the Contractor's authority to certify that this training information is accurate and complete.
- The Contractor agrees to abide by all applicable federal, state, and local laws and regulations regarding removal, storage, and treatment of contaminated soil done pursuant to or in conjunction with this contract.

END OF SECTION

SECTION 01060

REMEDIAL ACTION REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This section addresses permitting and regulatory compliance as related to the planning and execution of the remediation of silver-contaminated soils and sediments within the manmade segments of drainage ditches emanating from Building 731, NOS, Indian Head, MD. The Contractor shall be responsible for obtaining all applicable permits and conforming to all applicable or relevant and appropriate requirements pertinent to aspects of the remedial action at Site 5. These include, but shall not be limited to federal, state, local, and facility regulations and requirements.

1.2 ON-SITE WORK

1.2.1 Regulations applicable to on-site waste handling activities will include but not necessarily be limited to the following regulations promulgated under the Resource Conservation and Recovery Act (RCRA), Clean Air Act (CAA), the Occupational Safety and Health Act (OSHA), regulations promulgated by the State of Maryland under the Code of Maryland Regulations (COMAR), and Naval Ordnance Station regulations:

- RCRA - Subtitle C and Subtitle D Regulations
- OSHA - Occupational Health and Safety Standards (29 CFR Part 1910)
- OSHA - Recordkeeping and Reporting (29 CFR 1904)
- OSHA - General Industry Standards (29 CFR 1926)
- CAA - National Ambient Air Quality Standards (NAAQS)
- COMAR - Title 26, Subtitles 04, 07, 13

1.3 TRANSPORTATION

1.3.1 Waste/Material transportation regulations may include, but not necessarily be limited to the following:

- Department of Transportation (D.O.T.), Rules for the Transportation of Hazardous Materials (49 CFR Section 171)

1.4 OFF-SITE TREATMENT/DISPOSAL

1.4.1 Regulations applicable to off-site treatment and disposal of hazardous wastes, if required, will include but not necessarily be limited to the following:

- RCRA - Subtitle C and Subtitle D Regulations
- COMAR - Title 26, Subtitles 04, 07, 13

END OF SECTION

SECTION 01150

REMEDIAL ACTION MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This Section addresses the methods and procedures which will be used to measure the Contractor's Work and to provide payment to the Contractor for Work performance. For lump sum items, the Contractor will be paid on the basis of actual work accepted until the work item is completed. Upon completion of the item, 100 percent of the lump sum price may be paid, subject to the terms of the General Conditions or Supplementary Conditions. For unit price items, the Contractor will be paid for the actual amount of work accepted during the period of construction. After the work is completed and before final payment is made, final measurements will be made to determine the quantities of the various items of work accepted as the basis for final payment. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Government Representative.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in Bid Package and other sections of the Technical Specifications includes, but is not limited to, the following:

- Bid Schedule
- General Paragraphs: Section 01010
- Additional General Paragraphs: Section 01011
- Remedial Action Summary of Work: Section 01012

1.3 RELATED DOCUMENTS

1.3.1 The provisions of the Contract, including General and Supplementary Conditions and General Requirements (if any), apply to the work specified in this Section.

1.4 SCOPE OF PAYMENT

1.4.1 Payments to the Contractor will be made for the actual quantities of the contract items performed and accepted in accordance with the Contract Documents. Upon completion of construction, if these actual quantities show either an increase or decrease from the quantities given in the Bid, the contract unit prices will still prevail, except as provided hereinafter.

1.4.2 The Contractor shall accept in compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced by the Contract; also for all loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work and until its final acceptance by the Government Representative; and for all risks of every description connected with the prosecution of the work, except

as provided herein; also for all expenses incurred in consequence of the suspension of the work as herein authorized.

1.4.3 No extra payment shall be made to the Contractor for any delays caused by lack of progress, defective workmanship, or rescheduling of work by other contractors, subcontractors, or equipment and material suppliers.

1.4.4 No additional payment will be allowed because of differences between field dimensions and those shown on the Drawings should work be conducted before notifying the Government Representative of these differences. Additional costs caused by ill-timed or defective work, or work not conforming to Contract Documents, including costs for additional services shall be paid for by the party causing the rejected or non-conforming work.

1.4.5 Work done on written instructions of the Government Representative, other than defective or non-conforming work shall be paid for by the Government.

1.5 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

1.5.1 When alterations in the quantities of work not requiring Change Orders, as herein provided for, are ordered and performed, the Contractor shall accept payment in full at the contract price for the actual quantities of work done. Increased or decreased work involving Change Orders will be paid for as stipulated in such Change Orders.

1.6 ELIMINATED ITEMS

1.6.1 Should any unit price items contained in the bid schedule form be found unnecessary for the proper completion of the work contracted, the Government Representative may eliminate such unit price items from the Contract, and such action shall in no way invalidate the Agreement, and no allowance will be made for items so eliminated in making final payment to the Contractor.

1.6.2 Should any equipment or material be eliminated under a lump sum item then a Change Order shall be issued as stipulated in the General Conditions.

1.7 PARTIAL PAYMENTS

1.7.1 Partial payments shall be made monthly as the work progresses on a percent complete and accepted basis. All partial invoices and payments shall be subject to correction in the final quantity invoice and payment.

1.7.2 No monthly payment shall be required to be made when, in the judgment of the Government Representative the work is not proceeding in accordance with the provisions of the Contract Documents, or when in his/her judgment the total value of the work performed since the last payment amounts to less than \$1,000.00.

1.7.3 Retained amounts shall be limited, except where greater retention is necessary under specific circumstances specifically provided for in the General Conditions.

1.7.4 No partial payment shall be made upon items not explicitly defined within the bid schedule or incidental work of any kind which are not a permanent part of the Contract.

1.8 FINAL PAYMENT

1.8.1 The Contractor will make, as soon as practicable after the entire completion of the project, a final quantity invoice of the amount of the Work performed and the value of such work and the Government will then pay the sum found to be due, after deducting therefrom all previous payments.

1.9 INCIDENTAL WORK

1.9.1 Incidental work items for which separate payment is not measured include, but are not limited to, the following items:

- Permits and Approvals
- Support Facilities
- Surface Water, Decontamination Water, and Dust Control
- Environmental Protection
- Dewatering
- Trash Removal
- Loam and seeding
- Restoration of Disrupted Areas not designated in Technical Specifications and Design Drawings and Sketches
- Cooperation with other Contractors and others.
- Utility Crossings and Relocations, unless otherwise paid for.
- Minor items - such as replacement of fences, guard rails, rock wall, etc.
- Steel and/or wood sheeting as required, including that left in place.
- Temporary Facilities
- Project Record Documentation
- Sampling and Analysis
- Providing the services of the manufacturer's factory trained representative for adjustments, testing and instruction of operating personnel.

1.10 DESCRIPTION OF PAY ITEMS

1.10.1 The following pay items describe the measurement of and payment for the work to be done under the respective items listed in the Bid Schedule. Each lump sum or unit price stated in the Bid Schedule shall constitute full compensation, as herein specified, for each item of the work completed.

1.11 PAY ITEMS

1.11.1 Item No. 1: Project Planning, Site Preparation, Mobilization/Demobilization, Waste Excavation and Handling, Solidification/Stabilization, Placement/Compaction/Covering, Restoration, and Demobilization. Item No. 1 shall include excavation, treatment, and placement of the volume of soils/sediments defined within the design sketches and Section 02205.

1.11.1.1 Method of Measurement: Lump Sum

1.11.1.2 Payment: Payment shall be made at the contract lump sum price which shall be full compensation for all labor, materials, tools and equipment, and for all work and expenses incidental thereto for which payment is not provided under other items.

1.11.2 Item No. 2: Waste Excavation and Handling, Solidification/Stabilization, Placement/Compaction/Covering, and Restoration. Item No. 2 shall include excavation, treatment, and placement

of any additional volumes of soils/sediments removed as directed by the Government Representative as necessary to meet target clean-up levels as defined in Section 02205.

1.11.2.1 Method of Measurement: The quantity to be measured for payment shall be the actual tons or fraction thereof of dewatered soils/sediments treated through solidification/stabilization and placed within the explosion berm. Measurement shall be performed on soils/sediments free of standing water prior to treatment, as directed by the Government Representative. Measurements shall be made on suitable, State-certified scales.

1.11.2.2 Payment: Payment shall be made at the contract unit price per ton of soils/sediments treated/placed which shall be full compensation for furnishing labor, equipment, tools and other materials required; and for all other work and expense incidental thereto for which payment is not provided under other items.

1.11.3 Item No. 3: Loading, Off-Site Transport and Disposal of Debris. Item No. 3 shall include all activities associated with the removal of debris generated through project activities including, but not limited to: site preparation, treatment, restorations and mobilization/demobilization

1.11.3.1 Method of Measurement: The quantity to be measured for payment shall be the actual tons or fraction thereof of loaded debris. Measurement shall be performed on vehicles prior to removal from site and verified at the disposal facility. Measurements shall be made on suitable, State-certified scales.

1.11.3.2 Payment: Payment shall be made at the contract unit price per ton of debris loaded and delivered to the approved off-site disposal facility which shall be full compensation for furnishing labor, equipment, tools and other materials required; and for all other work and expense incidental thereto for which payment is not provided under other items.

END OF SECTION

SECTION 01410

REMEDIAL ACTION SAMPLING AND ANALYSIS

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This Section addresses the requirements for the sampling and analysis activities which shall be used during the execution of the remediation project. The Contractor shall provide all labor, materials and equipment for project sampling elements which are classified as Treatment- or Wastewater-Related, and Full-Shift Air Monitoring Sampling. The Government Representative shall conduct confirmatory sampling of wastes during excavation and perimeter air monitoring. The Contractor is required to submit as part of the Remediation Work Plan, a Sampling and Analysis Plan (SAP) which shall address all appropriate sampling and analysis requirements, procedures, timetables, and the location/frequency of sampling, along with relevant testing laboratory requirements, qualifications, and quality assurance/quality control program information.

The specifications contained within this section apply to the on-site laboratory, and any proposed alternative analytical methodology.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Summary of Work: Section 01012
- Contractor Quality Control: Section 01400
- Remedial Action Project Record Documents: Section 01721
- Remedial Action Waste Excavation: Section 02205
- Remedial Action Solidification/Stabilization: Section 02240

1.3 REFERENCES

1.3.1 The Contractor shall use the following references, or as appropriate their updated versions, to establish procedures for sampling and analysis elements of the remediation program:

- Test Methods for Evaluating Solid Waste, Third Edition, SW-846, U.S. Environmental Protection Agency
- Environmental Protection Agency Regulations on Test Procedures for the Analysis of Pollutants, 55 FR 33439, August 15, 1990
- Standard Methods for the Examination of Water and Wastes, American Public Health Association, 16th Edition, 1985
- Annual Book of ASTM Standards, Section 11, Water and Environmental Technology
- American Society For Testing and Materials, ASTM Method D1557 (Method C)
- Toxicity Characteristic Leaching Procedure (TCLP), 40 CFR 261, Appendix II, 1990.

- U.S. Army Corps of Engineers, "Interim Standard Air Monitoring Guide for Hazardous Waste Sites," June 1984.
- NIOSH Sampling and Analytical Methods, PB85-179018, February 1984

1.4 CONTRACTOR REQUIREMENTS

1.4.1 As part of this Project, the Contractor shall prepare and submit to the Government Representative a Sampling and Analysis Plan (SAP). This SAP shall establish the sampling and analytical procedures, along with quality assurance and quality control (QA/QC) procedures necessary for all sampling required of the Contractor for proper acquisition, handling, transportation, documentation, and interpretation for Contractor sampling activities. Submit the SAP (as part of the Remediation Work Plan) to the Government Representative for approval prior to the Notice to Proceed (NTP). The Contractor shall be responsible for implementing the SAP as defined within these specifications.

1.5 QUALITY MANAGEMENT OBJECTIVES

1.5.1 The goal of the SAP is to clearly define the types, frequency, and procedures for sample acquisition and analysis as well as assure that the chemical data collected is thoroughly documented, and legally and scientifically defensible. Quality objectives are necessary to assure that all chemical samples are accurately and precisely collected, analyzed and documented so that proper treatment and/or disposal of waste material, runoff and decontamination wash water is undertaken, and that costs incurred by the government for waste and wastewater handling and/or disposal are correctly derived.

1.6 LABORATORY QUALIFICATIONS

1.6.1 The qualifications of the laboratory(s) proposed by the contractor for inclusion in the analysis program will be reviewed by the Government Representative. Approval of the laboratory qualifications and validation by the Government Representative are required of any laboratory participating in the analysis program.

1.6.2 The laboratory(s) shall have capabilities, including equipment and qualified personnel, to perform all required tests within the project time specified within these specifications.

1.7 SAMPLING AND ANALYSIS PLAN

1.7.1 Remedial action-related sampling activities fall into the following categories:

- **Target Level Sampling During Excavation:** Subsequent to excavation of the specified dimensions and volumes of the streambed sediments (Section 02205), confirmatory samples of the unexcavated sediments will be acquired by the Government Representative, to ensure that remaining soils and sediments have silver concentrations of 10 mg/kg or less. Silver concentration analytical results shall be made available to the contractor no later than 24 hours after the time of sample acquisition. These data will be used by the Government Representative to direct any additional excavation.
- **Treatment-Related Sampling:** The Contractor shall acquire samples of the treated soils and sediments as part of the treatment/placement process in the area of the proposed explosion berm. Acceptance testing shall be performed on samples to ensure that: (1) treated materials meet physical geotechnical requirements as specified in Section 02240; and (2) silver in the treated material is not leachable, and will therefore remain immobile within the berm structure. Testing of the placed/treated material shall be completed as specified in Section 02240. Sampling results, except for TCLP testing,

shall be provided to the Government Representative within 24 hours sample acquisition. TCLP test results shall be provided within seven days.

- **Wastewater-Related Sampling:** Samples of all wastewater that is: (1) used during decontamination procedures; or (2) extracted from the excavation during waste removal and prior to backfilling, or is generated from the untreated or solidified/stabilized treated soils/sediments shall be taken and analyzed by the Contractor. Silver concentrations must be 1 milligram per liter (mg/l) or less to discharge into the Facility's sewage system. Wastewater to be discharged into the Facility's sewage system may not have biochemical oxygen demand (BOD) levels of greater than 200 mg/l, or total suspended solids (TSS) levels above 30 mg/l. Wastewater not meeting these requirements shall be pretreated to achieve the specified standards or disposed of off-site in an acceptable fashion. The Contractor shall provide analytical results to the Government Representative within 24 hours.
- **Air Monitoring:** The Contractor shall develop provisions and procedures for real-time full-shift air monitoring within the exclusion zone during remedial activities. The Contractor shall conduct air monitoring using COE Interim Standard Air Monitoring Guide for Hazardous Waste Sites and/or NIOSH methods as approved by the Government Representative. Sampling shall address airborne particulate monitoring. Conduct sampling within the exclusion zone during construction to determine if construction methods are adequate to prevent airborne particulate contamination; if adequate, monitoring may be discontinued at the discretion of the Government Representative.

1.7.2 Sampling Procedures: The Contractor shall incorporate the following information within the SAP:

- Fully describe the specific sampling procedures which shall be required to obtain reliable and representative soil/sediment, treated/placed material, wastewater, and air samples.
- These procedures shall be in conformance with appropriate EPA and ASTM guidelines, as well as NIOSH for air monitoring, unless otherwise specified by the Government Representative.
- Procedures to be used to obtain representative soil/sediment, treated material, and waste samples. Descriptions shall be provided with respect to sampling equipment, sample containers, preservation methods, and sample sizes.
- Procedures to be used to avoid sample contamination, including sample container cleaning procedures, sampler decontamination and sample handling.
- Sampling program organization, including individual responsibilities of the sampling team.
- Sampling personnel shall be trained by the Contractor in the specific procedures to be used for this project. Experience and qualifications of the sampling team shall be provided, together with a training program for personnel involved with sample collection.
- Sample identification procedures: A permanently bound field notebook shall be maintained onsite by the Contractor indicating the time, date and location of sample collection (including written description and map references), description of the sample and sample preservation, and sample container number.
- Sufficient quantities of samples shall be collected in order to perform the necessary QA/QC tests.

1.8 ALTERNATIVE ANALYTICAL METHODS

1.8.1 Alternative analytical methodology programs may be proposed in the Contractor's Remediation Work Plan. All such proposed programs shall be accompanied by a detailed technical rationale and identification of all proposed analytical methods including EPA or other appropriate method references. All such proposed programs require the written approval of the Government Representative.

1.8.2 The Contractor may provide an on-site laboratory facility with appropriate analytical apparatus and qualified laboratory personnel. The Contractor may elect to have certain analytical work performed either on or off-site provided all data quality requirements of the analytical program are met. Facilities shall be selected to optimize the scheduling of site remediation processes.

1.9 REPORTS

1.9.1 The Contractor shall prepare and submit to the Government Representative, Contractor Daily Sample and Analysis (SAP) Reports. The format for the Reports shall be included in the Remediation Work Plan, and must contain as a minimum the following items:

- Location of samples on site map.
- Work performed and all results.
- Quality management inspections performed and results.
- Problems identified and corrective actions taken, if any.
- Any verbal or written instructions from the Government Representative for re-sampling or changes of work.
- Records of any samples taken and personnel involved.
- Other appropriate general remarks.

1.9.2 Reports of Problems: Prepare for any significant problems with instrument calibrations or Project Quality control, and deliver to the Government Representative immediately and no longer than 24 hours of occurrence (or less if a safety problem is involved). Include a description of the problem along with the corrective actions taken to rectify the problem.

END OF SECTION

SECTION 01510

REMEDIAL ACTION TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 Work Included: The Contractor shall provide such temporary facilities as the work may warrant. Facilities include, but are not limited to:

- Sanitary Facilities
- Soil/Sediment Storage and Staging Area
- Equipment Decontamination Facility
- Personnel Decontamination Facility
- Access Roads/Routes
- Trash Dumpster/Containers
- Fencing
- Scales
- Safety Equipment

1.1.2 Upon completion of the work, completely remove all Contractor installed temporary facilities. Repair all damage caused by the installation or remediation.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Special Project Procedures: Section 01125
- Remedial Action Site Maintenance: Section 01710
- Remedial Action Demobilization: Section 01712
- Earthwork for Structures and Pavements: Section 02221

1.3 SUBMITTALS

1.3.1 Decontamination Facilities: Submit final details for decontamination facilities for vehicles/equipment and personnel, along with procedures for management of wastes generated at the facilities for approval from the Government Representative prior to beginning work as a component of the Remediation Work Plan.

1.3.2 Soils/Sediments Staging Area: Submit final details necessary for the construction of the staging area, along with procedures for the management of wastes generated at the facility for approval from the Government Representative prior to beginning work as a component of the Remediation Work Plan.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 All personnel safety equipment employed shall be in compliance with state and federal requirements, including OSHA and in accordance with the approved Remediation Work Plan.

2.1.2 The equipment decontamination facility shall be located such that any equipment leaving the exclusion zone shall be decontaminated prior to leaving the site. The pad shall have a collection system for proper management of wash water. The facility shall be equipped with the following equipment:

- High pressure steam generating unit with a self-contained water storage tank and pressurizing system.
- Suitably sized to provide a minimum of 500 psi with a 0.5 to 5 GPM flow range and a nominal temperature of 200° F.
- Storage Tank: Minimum size of 200 gallons/maximum size 1000 gallons.
- Wash Equipment Hose: Minimum of 50 ft. in length.
- Equipment (pumps/lines) to remove wastewater from the pad to the storage tank.

2.1.3 The personnel decontamination facility shall include at a minimum 2 showers, and adequate locker and change room facilities for all on-site personnel.

2.1.4 A temporary, State-certified scale for weighing activities associated with remedial activities shall be installed on-site by the Contractor.

2.1.5 Dumpsters for general site trash collection with minimum weekly disposal shall be provided for by the Contractor. The size of the dumpster shall be at least 6 cubic yards. Dumpsters shall not be used for disposal of hazardous or special waste materials. As necessary, the Contractor shall provide appropriate separate containers approved by the Government Representative (e.g., drums) for storage and disposal of potentially hazardous trash. Clearly label all containers to indicate their contents.

2.1.6 All necessary equipment for the protection of the traveling public shall be furnished and maintained as specified in the Manual on Uniform Traffic Control Devices (Part VI).

PART 3 - EXECUTION

3.1 PERFORMANCE:

3.1.1 Potable Water Supply:

- The facility will provide the Contractor with a source for fresh water. The Contractor shall furnish and install pipes, valves, and other equipment as necessary to access the water.
- The Contractor shall install a backflow preventer on the line(s) he installs to access the fresh water supply before any water may be received from the source.
- The Contractor shall determine what disinfection measures (if any) are necessary and shall install the appropriate engineering controls to produce potable water.

3.1.2 Wash water shall be collected and removed from the decontamination pad, tested as indicated in Paragraph 3.6 in Section 01030, and, if approved by the Government, discharged in accordance with

the direction of the Government Representative. The Contractor shall furnish and install all pipes, valves, pumps, and other equipment necessary for proper discharge of wastewater.

3.1.3 Runoff collected from the soils/sediments excavation, storage, and staging area shall, to the maximum extent practicable, be utilized as feed water in the solidification/stabilization process. If this is not practicable, the collected water shall be tested and managed appropriately, and in accordance with paragraph 3.4 of Section 01030.

3.1.3 All structures installed under this Section shall be provided with non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A, 10B, 10C. Locate and distribute fire extinguishers in accordance with NFPA 10, Portable Fire Extinguishers.

3.2 REMOVAL OF FACILITIES

3.2.1 Remove all temporary facilities installed upon project completion.

3.2.2 Remove materials associated with the soils/sediment storage and staging area and equipment/vehicle decontamination facility. Contaminated materials shall be thoroughly decontaminated.

3.2.3 The areas used for the staging/storage and decontamination facilities shall be restored to the contours and conditions existing prior to remediation of the site, or where appropriate, to the construction contours as specified in the Mix, Assemble, and Cure Facility Specifications.

END OF SECTION

SECTION 01710

REMEDIAL ACTION SITE MAINTENANCE

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 The Contractor shall maintain the remediation site free from accumulations of waste, debris, and rubbish, caused by operations.

1.1.2 At completion of work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight-exposed surfaces.

1.1.3 At completion of work, remove Contractor equipment and materials from the site.

1.1.4 Remove temporary facilities specified in Sections 01510 and 01712.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Summary of Work: Section 01010
- Remedial Action Special Project Procedures: Section 01030
- Remedial Action Temporary Facilities: Section 01510
- Remedial Action Mobilization/Demobilization: Section 01712

1.3 SAFETY REQUIREMENTS

1.3.1 Standards: Maintain project in accordance with following safety and insurance standards:

- Manual of Accident Prevention in Construction (Associated General Contractors).
- Hazards Control: Prevent accumulation of wastes which create hazardous conditions. Provide adequate ventilation during use of volatile or noxious substances.
- Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws. Do not burn rubbish and waste materials on NOS property. Non-hazardous materials will be disposed in an approved off-base landfill. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Do not dispose of wastes into streams or waterways.
- Cleaning activities shall be conducted in accordance with the approved Remediation Work Plan.
- Post Material Safety Data Sheets in appropriate locations and make available for employees.
- No waste of any kind may be disposed of at the Facility.

PART 2 - PRODUCTS

2.1 DECONTAMINATION MATERIALS

2.1.1 Use only cleaning materials, such as liquinox soap, which are recommended by the manufacturer of the surface to be cleaned (e.g. geomembrane liners). Use cleaning materials only on surfaces indicated by cleaning-material manufacturer. For other surfaces, liquinox soap, or its equivalent, should be used in the decontamination process. Furnish with a portable wash unit; see Equipment Decontamination as specified in Temporary Facilities, Section 01510. The Contractor shall not utilize any material which generates a listed or characteristically hazardous waste in any decontamination or cleaning process associated with the Remedial Action.

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

3.1.1 Execute cleaning to ensure that the site is maintained free from accumulations of waste materials and rubbish. At reasonable intervals during progress of work, clean site, and dispose of waste materials, debris, and rubbish. The Government Representative may require additional cleaning if in his/her opinion it is needed.

3.1.2 Provide on-site containers for collection of waste materials, debris, and rubbish. Remove waste materials, debris and rubbish from site and legally dispose of at public or private facilities off Station property.

3.1.3 Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

3.2 FINAL CLEANING

3.2.1 In preparation for substantial completion, conduct final inspection of site. Maintain cleaning until project is substantially complete. The Government Representative will make final determination of site cleanliness and the Contractor will continue to clean site to satisfaction of Government Representative. All project facilities shall be decontaminated and removed as outlined in Section 01712 - Demobilization.

END OF SECTION

SECTION 01712

REMEDIAL ACTION MOBILIZATION/DEMobilIZATION

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This section covers the requirements for proper site mobilization prior to the start of remedial activities and demobilization at the completion of all work required to execute the remedial action at Site 5. All mobilization/demobilization activities shall be defined within the Remediation Work Plan.

1.1.2 The work shall consist of the mobilization and demobilization of the Contractor's personnel, equipment, and materials necessary for the performance of the remedial action. It shall include the transportation of personnel, equipment and operating supplies to the site; establishment of offices, all necessary utilities, and other preparatory work at the site, along with proper removal of such.

1.1.3 Mobilization work activities will include, but not be limited to, the following:

- The installation of fencing surrounding the remediation as shown in the design sketches.
- Establishment and setup of all temporary facilities and their according utilities, as specified in Section 01510, Temporary Facilities;
- Establishment of the staging area;
- Establishment of the decontamination area;
- Delineation of the exclusion zone(s), and of the areas to be cleared (see Figure 1);
- The delivery on-site of all remedial action related equipment, such as backhoes, trucks, storage containers, decontamination equipment, etc.,

The Contractor shall not initiate cleanup activities until all mobilization activities are complete.

1.1.3 Demobilization work activities will include the following:

- Decontamination and removal from site of all Contractor equipment and materials.
- Collection and disposal of all Contractor generated contaminated materials and equipment for which decontamination is inappropriate, including materials used to construct the decontamination pads.
- Decontamination of site dedicated equipment and facilities operated by the Contractor and removal from site, including excavation, treatment, and support equipment.
- Disconnect and remove treatment facility equipment and portions of utilities as specified in this Section.
- Remove and dispose or return temporary facilities specified in Section 01510.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Summary of Work: Section 01012
- Remedial Action Temporary Facilities: Section 01510
- Remedial Action Off-site Transportation: Section 02081
- Remedial Action Off-site Disposal: Section 02082

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 DECONTAMINATION

3.1.1 Decontaminate all facilities, equipment, and materials prior to final removal except where inappropriate.

3.2 STORAGE ON SITE:

3.2.1 On-site storage of contaminated materials shall be in drums, plastic bags, or otherwise contained and covered to prevent contaminating environmental media and NOS facilities.

3.3 FINAL APPROVAL

3.3.1 Prior to removal from site, all decontaminated equipment and materials shall be inspected and approved for removal by the Government Representative.

3.4 OPERATION AREAS

3.4.1 Prior to removal of temporary and treatment facilities and equipment, thoroughly wash down and decontaminate all equipment and facilities prior to site close out. Remove sediments and liquid from any catch basins and sumps, if necessary. Sediments shall be treated with the remainder of contaminated soil. The liquid shall be sampled, tested, and disposed of as specified in Paragraph 3.6 in Section 01030, Remedial Action Special Projects Procedures.

3.4.2 Remove the fence installed at the site following completion of backfill operation and removal of decontaminating equipment.

3.4.3 The Contractor shall repair any erosion or runoff related damage to the site and reseed as specified in Section 02930.

3.5 DECONTAMINATION AND STAGING AREA

The Contractor shall dismantle and properly dispose of and/or remove from the site all temporary and supporting facilities no longer required for construction including but not limited to the decontamination and any soils/sediments storage and staging areas.

The Contractor shall not dismantle the solidification/stabilization facility until after the complete and successful demobilization of the staging area, the decontamination pad, and any sedimentation basins or other controls that may contain silver-contaminated sediments/soils. The solidification/stabilization facility will be necessary for the proper treatment of such materials. The Contractor shall dismantle and demobilize the solidification/stabilization equipment only after receiving approval from the Government Representative.

3.5.1 Upon completion of equipment decontamination, thoroughly wash down the equipment decontamination pad. Remove sediments from the collection system and treat as described in Paragraph 3.4.1. Remove decontamination pad and dispose of at off-base sanitary landfill. See Section 02081, Remedial Action Off-site Transportation, and Section 02082, Remedial Action Off-site Disposal.

3.5.2 Upon removal of stored materials from the staging area, remove any remnant sediments and other materials from the collection sump and treat them as described in paragraph 3.4.1. Any materials that exhibit silver concentrations greater than 10 mg/kg shall be treated through solidification/stabilization and incorporated into the berm expansion.

END OF SECTION

SECTION 01721

REMEDIAL ACTION PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 Keep accurate record documents for all additions, substitution of material, variations in work, and any other revisions to the Contract Documents.

1.1.2 Provide legible documentation suitable for microfilm.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Special Project Procedures: Section 01030
- Remedial Action Regulatory Requirements: Section 01060

1.3 MAINTENANCE OF DOCUMENTS

1.3.1 Maintain at job site, one copy of:

- Record Drawings showing progress of work.
- Specifications.
- Addenda.
- Change Orders.
- Other Modifications to Contract.
- Field Test Records.
- Contractor's daily progress or activity reports, including:
 - a. Photographs.
 - b. Reports on any emergency response actions.
 - c. Manifest documents and variance reports.
 - d. Records of all site work.
 - e. Chain-of-custody documents.
 - f. Truck-load tickets and shipping papers (manifests).
 - g. All available laboratory analytical results.
 - h. Meteorological records.
 - i. Daily inspection records for staging/storage.
 - j. All safety and accident incidents.
 - k. Reports on all spill incidents.
 - l. Construction quality control daily reports.
 - m. Other items as may be required by the Government Representative.
- Wage records as required for federally and state funded projects.
- Other documentation as required by agencies having jurisdiction.

- 1.3.2 Store documents in a dry safe place, apart from documents used for construction.
- Provide files and racks for storage of documents.
 - Do not use record documents for construction purposes.
 - Make documents available as directed by the Government Representative for inspection by authorized representatives of Federal or State agencies.
- 1.4 SUBMITTAL
- 1.4.1 At completion of project, deliver record documents to the Government Representative.
- 1.4.2 Accompany submittal with transmittal letter, in duplicate, containing:
- Date.
 - Project title and number.
 - Contractor's name and address.
 - Title and number of each record document.
 - Certification that each document as submitted is complete and accurate.
 - Signature of Contractor, or his authorized representative.
- 1.4.3 Documents shall be submitted to the Government Representative at completion as a condition of final payment.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

Not applicable

END OF SECTION

SECTION 02081

REMEDIAL ACTION OFF-SITE TRANSPORTATION

PART 1 - GENERAL

1.1 DESCRIPTION

During the execution of the remedial action, debris will be generated through site preparation, excavation, wastewater pretreatment processes, and demobilization. This non-soil and non-sediment waste may not be amenable to on-site treatment and will require off-site transport and disposal. Based on site characterization data, debris shall undergo appropriate decontamination procedures (i.e., removal of soil/sediment) and can be disposed of as solid waste. The Contractor shall not be permitted to dispose of any waste on-site. This section specifies requirements for the transport of remedial action-generated wastes not amenable to on-site treatment and management.

1.1.1 The Contractor shall provide equipment, personnel and facilities necessary to handle, load, and transport the waste materials.

1.1.2 The Contractor shall comply with all applicable regulatory requirements listed as well as other applicable federal, state or local laws, codes and ordinances which govern or regulate solid wastes. Verify that all vehicles entering and leaving the site comply with all safety requirements.

1.1.3 The Contractor shall inspect vehicles before leaving the site.

1.1.4 Transport materials from the site to an off-base disposal facility approved by the Government Representative that is licensed to accept waste generated as part of the remedial action.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Special Project Procedures: Section 01030
- Remedial Action Regulatory Requirements: Section 01060
- Remedial Action Off-site Disposal: Section 02082
- Remedial Action Waste Excavation: Section 02205

1.3 REFERENCES

- Federal Solid Waste Management Regulations; 40 CFR 241 and 243.
- Federal Hazardous Waste Management Regulations; 40 CFR 260-265.
- State of Maryland Solid Waste Management Regulations; MDE-COMAR 26.04.07.
- State of Maryland Hazardous Waste Regulations; MDE-COMAR 26.13.01-04.

1.4 SITE ENTRY

1.4.1 All transporters must follow the appropriate Health and Safety protocols established for the site within the Remediation Work Plan. Normal operating procedure will involve site entry at the exclusion zone entrance with sign in, entry to the site with the appropriate level of protection, followed by proceeding to area as designated by the Contractor.

1.5 VEHICLE REQUIREMENTS

1.5.1 Bulk Waste Transportation:

1.5.1.1 Use vehicles licensed under the State of Maryland and other states as appropriate. All vehicles will have identification numbers displayed as per DOT regulation defined within 49 CFR 172.336 a,b. Transporter will provide placards or identification number as required. All trucks shall be washed and clean prior to arriving at the site. The trucks' beds shall be lined with a suitable synthetic liner to prevent leaks/dischage during transport. All vehicles shall have their beds adequately covered with a tarpaulin or similar control to prevent turbulence from removing any of the material being transported.

1.5.1.2 Transporters of wastes off-site shall be in full conformance with state laws as well as any other applicable federal laws, including DOT requirements.

1.6 SPILL CONTROL

The Contractor is responsible for any and all actions necessary to remedy situations involving waste spilled in loading or transit. See Spill Control as specified in Remedial Action Special Projects Procedures - Section 01030.

1.7 SUBMITTAL

1.7.1 The Contractor shall incorporate a transportation plan for off-site transportation and disposal of remedial action wastes not amenable to on-site treatment and management. The Contractor will detail the procedures for loading and transporting materials off-site, including vehicle type, container type, name and address of transporter, and routing.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall organize and maintain the required material shipment records, along with any documentation requirements stipulated under the State of Maryland Code of Regulations.

3.1.2 The Contractor shall coordinate the schedule for truck arrival and material deliveries at the disposal site to meet the approved project schedule. The schedule shall be compatible with the availability of equipment and personnel for material handling operations.

3.1.3 The Contractor shall obtain letters of commitment from waste haulers and disposal facilities indicating agreement to handle and accept the expected quantities of material to be generated through the remedial action.

3.2 LOADING

3.2.1 The Contractor shall provide equipment, personnel, and facilities necessary to handle/load materials for transport.

3.2.2 The following solid waste categories will require loading and handling: bulk solids, construction and site preparation debris and solid wastes not amenable to on-site treatment.

3.2.3 The loading equipment driver and other personnel shall comply with requirements of the Remediation Work Plan and must have protective equipment required by the Health and Safety Plan for on-site work.

3.2.4 Vehicle Decontamination: All vehicles leaving the site shall pass through the decontamination facility and be inspected by the Contractor to ensure that no soil adheres to its wheels or undercarriage. At a minimum, the vehicles wheels and undercarriage shall be washed using high pressure water and/or steam. If necessary, the vehicle shall be scrubbed down in order to remove all soil adhering to the vehicle. Subsequent to delivery to off-site location, vehicles shall be decontaminated prior to re-entry at the Facility using appropriate methods. Off-site decontamination procedures shall be defined within the Remediation Work Plan. The Contractor shall also implement any necessary controls to prevent the tracking of contaminated materials within the exclusion zone. The Contractor shall indicate how this will be accomplished in the Work Plan.

3.3 MEASUREMENT

3.3.1 Measure the weight and volume of waste material in the transporting vehicle prior to leaving the site using a method specified within the Remediation Work Plan as defined within Section 01150, Measurement and Payment, and approved by the Government Representative. All weight measurements shall be performed on State-certified scales.

3.4 HAULING

3.4.1 Implement a hauling or transport schedule that allows for removal of the waste from the site at a rate commensurate with the waste handling schedule.

3.4.2 Identify the route of travel for all vehicles going to or from the site to the final disposal area identified. This route shall not be changed without approval by the Government Representative.

3.4.3 Normal Operating Procedure:

- Coordinate with the Governments Representative for vehicle inspection and recording of quantities and types of wastes leaving the site.
- Transporter shall receive completed records as necessary for removal of solid wastes.
- Transporter must sign-out prior to leaving site.

END OF SECTION

SECTION 02082

REMEDIAL ACTION OFF-SITE DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION

The work specified hereunder in this section shall involve the off-site disposal of any materials that are not amenable to on-site solidification/stabilization treatment or disposal in the Facility's sewage system. Based on the available site characterization data, Site 5 materials are classified as solid wastes and will require appropriate off-site management subsequent to any necessary soil/sediment removal.

1.1.1 The Contractor shall provide for off-site disposal of site preparation and demolition debris (i.e., tree roots, solid wastes), used personnel protective equipment, and residuals from the treatment unit. Wherever possible, dismantle fencing or other existing structures/equipment in such a manner so that they may be reused during site restoration procedures.

1.1.2 Felled trees and uncontaminated portions of tree trunks shall be considered saleable timber. Trim limbs and tops, and saw into eight-foot lengths and stockpile onsite as directed by the Government Representative. The stockpiled timber shall remain the property of the Government.

1.1.3 The Contractor shall be responsible for acceptance of the specific material at an approved disposal facility, for ensuring that the facility is properly permitted to accept the waste, and that the facility provides the stated treatment and/or disposal services.

1.1.4 The Contractor shall record weights, volumes, and character of materials disposed. Ensure that weighing devices used are certified by the appropriate state inspection agency.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Remedial Action Regulatory Requirements: Section 01060
- Remedial Action Special Project Procedures: Section 01030
- Remedial Action Off-Site Transportation: Section 02081
- Clearing and Grubbing: Section 02102
- Remedial Action Waste Excavation: Section 02205

1.3 SUBMITTALS

1.3.1 As part of the Remediation Work Plan, the Contractor shall develop an Off-Site Disposal Plan which shall include at a minimum:

- Proposed disposal facility for waste, including ownership, location, disposal, and if applicable, State identification code.

- Materials to be disposed at proposed facility.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 COORDINATION

3.1.1 Prior to the commencement of work, verify the acceptability of the proposed off-site disposal facility with the Government Representative.

3.1.2 Disposal Facility: The Contractor shall be responsible for ensuring the acceptance of the specified waste at an approved disposal facility, that the facility is properly permitted to accept the stated waste, that the facility provides the stated disposal services, and that the disposal facility is in compliance with its permit(s) at the time of waste disposal.

3.2 RECORDKEEPING

3.2.1 The Contractor shall obtain appropriate forms, obtain material code numbers, and complete the shipment records as required by the appropriate regulatory agencies for verifying the material type (Code Type) and quantity of each load in unit volume and weight. Copies of the records shall be submitted to the Government Representative within two business days following shipment, and within two business days after notification of receipt at the disposal facility. Any discrepancies shall be reported immediately to the Government Representative and be resolved by the Contractor.

3.2.2 The Contractor shall provide a final report to the Government Representative with written documentation and records verifying receipt and the quantity received of each load at the disposal facility and verification of proper disposal. Copies of the actual disposal receipt shall be provided to the Government Representative.

3.2.3 All disposal records shall be approved by the Government Representative after review and prior to off-site transport and disposal.

END OF SECTION

SECTION 02100

REMEDIAL ACTION SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This section addresses requirements for preparation of Site 5 for all activities associated with the remedial action. The Contractor shall be responsible for clearing, grubbing, stripping, and grading site areas required to support remediation including, but not limited to, access routes, excavation, decontamination, storage, treatment, and placement areas.

1.1.2 The Contractor shall be responsible for the preservation of all facilities, property, fences, existing trees, plants, and other vegetation that is to remain at, or adjacent to the project site. The Contractor shall use precautions to prevent damage or injury from all remediation actions. The Contractor shall repair or replace any material damage incurred by remediation-related work to a condition that is acceptable to the Government Representative.

1.2 RELATED REQUIREMENTS

- Remedial Action Summary of Work: Section 01012
- Remedial Action Temporary Facilities: Section 01510
- Environmental Protection: Section 01560
- Remedial Action Off-site Transportation: Section 02081
- Remedial Action Off-site Disposal: Section 02082
- Clearing and Grubbing: Section 02102

1.3 REGULATORY REQUIREMENTS

1.3.1 Off-site transportation and disposal of debris shall be performed in accordance with the specification and Sections 02081 and 02082.

2.1 EQUIPMENT

2.1.1 The Contractor shall provide all equipment, labor, and materials required to perform work as specified in this section.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

3.1.1 The surface of the ground, within areas to be excavated or graded as required to execute the remediation project shall be completely cleared of all timber, brush, stumps, roots, grass, weeds, rubbish, construction or other debris, and other obstructions resting on or protruding through the surface of the ground. Clearing operations shall be conducted in a manner that prevents damage to existing structures, utilities, and installations and those under construction.

3.1.2 Grubbing shall consist of the complete removal of all stumps, roots larger than 1.5 inches in diameter, matted roots, brush, timber, logs, and any other organic or debris resting on, under or protruding through the surface of the ground, to a depth of 18 inches and within the areas to be excavated as defined in the design sketches.

3.1.3 All materials and debris which are removed from uncontaminated areas by the clearing and grubbing operations shall be segregated from materials which are removed from contaminated areas, as defined by the sediment excavation areas and zones in the design sketches (Figure 1) and section 02205. See Section 02205, Remedial Action Waste Excavation, for specific areas and quantities to be cleared/excavated. Soils and sediments adhering to material removed from contaminated material shall be removed by mechanical means, and the material stored within the contaminated soils and sediments storage area for later treatment. The Contractor shall include within the Work Plan a detailed description of the methods and equipment he will employ to accomplish adequate decontamination/removal of contaminated soils and sediments. No cleared or grubbed material or debris shall be disposed of in backfill areas.

3.2 GRADING

3.2.1 Grading in preparation for excavation, access route installation, storage/staging, decontamination, treatment, and placement areas shall be performed in all locations to be employed throughout the remedial action to the necessary lines, grades, and elevations. During the grading process, the subgrade shall be maintained in such condition that it will be well drained at all times. When necessary or directed by the Government Representative, temporary drains and drainage shall be installed to intercept or divert surface water runoff. Grading also includes cutting drainage ditches and shaping access and access route subgrades. Final grading and dressing of the site shall be performed by the Contractor to the extent required to assure proper and adequate drainage.

3.2.2 As necessary, the Contractor shall provide erosion control measures and maintain site areas in a neat manner. Where necessary, the Contractor shall reseed areas damaged by construction activities.

END OF SECTION

SECTION 02205

REMEDIAL ACTION WASTE EXCAVATION

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 This section addresses activities necessary to remove contaminated soils/sediments from the manmade segments of drainage ditches emanating from Building 731. Work included in this activity involves excavation, loading, and on-site hauling of contaminated soils/sediments. The excavation will be maintained free from surface water by utilizing appropriate engineering controls including dewatering equipment throughout the contaminated material removal process and until ditch remediation is complete.

1.2 LIMITS OF EXCAVATION

1.2.1 The Contractor shall remove the volume of sediments and soil five feet to each side laterally from center stream (total of ten [10] feet wide) and to a depth of two (2) feet vertically below ground surface (bgs), as shown in the design sketches, within a tolerance of plus or minus 0.1 feet. Once the Contractor has excavated the required volumes as specified within the limits of excavation and excavation cross-section design sketches and at incremental distances defined in the Remediation Work Plan, confirmatory sampling will be completed by the Government Representative. Once the Government has reviewed the results of the soils/sediments analyses, the Government Representative may require the Contractor to excavate an additional volume of soil/sediment specified by the Government Representative to attain target cleanup level concentrations of 10 mg/kg of silver. Subsequent sampling and analysis shall follow each excavation sequence. Results from confirmatory sampling shall be available within 24 hours of sample acquisition.

The Contractor shall limit excavation to only those portions of the two drainage systems that are man-made. In order to meet excavation target levels of 10 mg of silver per kg of soil/sediments, the Contractor may be required to extend excavation beyond a five-foot distance laterally from the center of the stream, or to a depth greater than two feet bgs; however, the Contractor may not extend excavation longitudinally into the natural drainage areas (see Figure 1). The Contractor and the Government Representative shall work together closely to coordinate excavation, sampling, and analysis to minimize downtime. The Contractor shall schedule work to facilitate sampling and analysis by the Government Representative. Any material removed from authorized areas outside of the areas as described above, and as delineated in the design sketches, shall be considered indefinite quantity work. See Section 01150, Remedial Action Measurement and Payment.

1.2.2 Unauthorized Excavations: Removal of soils/sediments beyond the specified width, depth, and length dimensions specified herein and illustrated within the design sketches, without specific direction from the Government Representative, is prohibited.

1.3 SEQUENCE OF EXCAVATION

Excavation of Site 5 drainage ditches shall be initiated at the most upstream positions (adjacent to Building 731) and progressively move downstream within each drainage ditch. The drainage ditch

impacted by the explosion berm expansion shall be excavated first, with the remaining ditch excavated upon completion of excavation activities in the first ditch.

1.4 JOB CONDITIONS

1.4.1 Existing Utilities: Locate all utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during remedial activities. Should uncharted or incorrectly charted piping or other utilities be encountered during work, consult the Government Representative immediately for directions as to procedure.

1.4.2 Protection of Persons and Property: Employ the exclusion zone approach throughout all excavation activities. Protect the public, structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created through excavation operations.

PART 2 - PRODUCTS

Not applicable

PART 3 - EXECUTION

3.1 PERFORMANCE

3.1.1 Preparation: Prior to any excavation, contact all appropriate personnel and/or agencies and obtain all required permits (i.e., approved erosion and sediment control plan and facility digging permits). Examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the Government Representative in writing of conditions detrimental to the proper and timely completion of the work. Prior to breaking ground notify the Government Representative as to when excavation is to begin. Remove and dispose of obstructions visible on the ground surface. Complete all necessary clearing including the removal of vegetation, debris, and obstructions as necessary.

3.1.2 Classification: The excavation identified within this clause is unclassified. All excavation shall be completed regardless of the type, nature, or condition of the materials encountered.

3.1.3 Surface Water Control: The Contractor shall keep excavations dry throughout the contaminated material removal process and until backfilling is complete. Surface water control shall be performed when necessary at no additional cost to the Government. Dispose of water pumped or drained from the construction site in a suitable manner to avoid public nuisance, injury to public health, damage to public and private property, and damage to the environment and the work completed or in progress. Provide suitable temporary channels for water that may flow along or across the construction site. Do not allow ground or surface water to enter excavations. All water collected from potentially contaminated areas shall be managed in accordance with an approved erosion and sediment control plan which includes provisions for trapping and management of potentially contaminated sediments. See Section 01030, Remedial Action Special Project Procedures, paragraph 3.4.2, for specific implementation requirements. Prior to the initiation of excavation, divert surface water inflow to the drainage ditches from non-contact cooling water discharged from Building 731 and condensation discharge from the site steamlines. This inflow shall be managed using two catch basins equipped with level actuated pumps and lines which move water to drainage ditches along Voegeli Road as shown in the Design Sketches.

Cooling water from Building 731 currently flows to the east stream through a drainage pipe. The outfall of the drainage pipe is approximately 50 feet from the southeast corner of Building 731. The

Contractor shall remove this 50-foot section of pipe, to facilitate the excavation of the soils and sediments from the building to the outfall. The pipe shall be properly decontaminated and disposed of off-site. See Sections 02081 and 02082; Off-site Transportation and Off-site Disposal.

3.1.4 Stability of Excavations: Slope sides of excavations for existing soil conditions to comply with OSHA standards, and local codes and ordinances having jurisdiction. Sheet, shore, and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

3.1.5 Soil Excavation and Handling: The Contractor shall provide all the necessary labor, equipment, and materials to efficiently remove and handle contaminated soils and sediments from the drainage ditch network. The Contractor shall perform the necessary excavation to attain target cleanup levels for silver in soils and sediments (10 mg/kg). Excavated materials shall be handled in such a fashion as to prevent the release of excavated materials to the environment. Contaminated soils/sediments will be loaded directly into leak-proof containers which will be removed promptly to the soils/sediment storage/staging area. Any subsequent handling of the material, such as consolidation or dewatering, will occur at the staging area. Contaminated soils/sediments will be transported on the site in containers or vehicles designed to transport such materials without spillage. Care shall be taken during loading, handling, and transporting to minimize the potential for spillage, tracking, or other means of deposition of contaminated materials. Contaminated materials which are released shall be cleaned up immediately to the satisfaction of the Government Representative, employing procedures as specified within the Spill Control Plan (a component of the Remediation Work Plan), with no additional cost to the Government.

3.1.6 Preventing Tracking of Contaminated Soils/Sediments: The Contractor shall implement any necessary controls to prevent the tracking of contaminated materials within the exclusion zone. The Contractor shall indicate how this will be accomplished in the Work Plan.

3.1.7 Material Storage: Store contaminated excavated materials as necessary within the soils/sediments storage and staging facility detailed in Section 01510, Temporary Facilities.

3.1.8 Sorting of Debris: Debris encountered during excavation shall be removed and transported to a disposal facility licensed to accept the debris. Debris removed from areas within the excavation zone shall be decontaminated through the removal or any adhering soils/sediments. Debris removed from areas outside of the excavation zone shall be considered uncontaminated. See Sections 2081 and 2082, Remedial Action Off-site Transportation and Remedial Action Off-site Disposal.

3.1.9 Backfilling: Backfilling of the excavated areas may begin only when sampling results indicate acceptable contaminant concentration levels have been attained. The Contractor shall not begin placing earthfill in excavated areas without the approval of the Government Representative.

END OF SECTION

SECTION 02221

REMEDIAL ACTION DRAINAGE DITCH RESTORATION

PART 1 - GENERAL

1.1 DESCRIPTION

1.1.1 This section addresses activities involved in the restoration of the manmade drainage ditches subsequent to excavation. Work required under this section includes restoration of all areas subject to excavation, clearing, and any other usage associated with the remedial action.

1.1.2 The Contractor shall restore the drainage ditches, ditch banks, and disturbed areas within the construction zone to conditions consistent with the MILCON P-059 design drawings. Restoration shall mean that topography, soil, and ditch location and gradient shall be as similar to pre-remediation conditions as practicable. Erosion controls (jute thatching) within the ditches and along the stream bank shall be used to support restoration. Restoration shall also mean that the restored stream will be functionally similar, as practicable, in terms of surface water runoff and retention, and flood and erosion prevention to that which was there prior to excavation.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Contractor Quality Control System: Section 01400
- Earthwork for Structures and Pavements: Section 02221

1.3 QUALITY ASSURANCE

1.3.1 Testing and Inspection Service: The Contractor shall conduct testing and inspection services in accordance with the Contractor Quality Control System for backfill and compaction as specified in Section 02221 and 01400.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Backfill materials shall be consistent with those specified within Section 02221.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 The Contractor shall examine the areas and conditions under which backfilling, compaction, and grading are to be performed and notify the Government Representative in writing of conditions detrimental to the proper and timely completion of the work.

3.2 BACKFILL AND FILL

3.2.1 General: Place soil material in layers to required subgrade elevations.

3.2.2 Backfill excavations as promptly as work permits, but not until completion of the following:

- Approval given by the Government Representative
- Removal of any sheeting, shoring and bracing, and backfilling of voids, as necessary
- Removal of trash and debris

3.2.3 Placement: Place backfill and fill materials in layers of not more than 12 inches in loose depth. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content.

3.3 COMPACTION

3.3.1 Compaction shall not be less than 90 percent of maximum as determined by Modified Proctor (ASTM D1557).

3.4 GRADING

3.4.1 General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finish surface to required construction elevations, compact with uniform levels or slopes and existing grades. Grade areas to drain away from structures and to prevent ponding. Finish grassed areas to receive topsoil to within not more than 0.1 foot of the required elevation.

3.5 EROSION CONTROL

3.5.1 Re-establish turf in all appropriate areas impacted by construction. Install geotextile fabric within drainage ditches to prevent erosion as shown in the design sketches.

END OF SECTION

SECTION 02240

REMEDIAL ACTION SOLIDIFICATION/STABILIZATION

PART 1 - GENERAL

1.1 DESCRIPTION

This specification establishes the requirements for the treatment and incorporation of silver-contaminated soils and sediments excavated from manmade drainage ditches emanating from Building 731. Tasks involved in the treatment and placement of excavated materials includes completion of a treatability study to develop a solidification/stabilization (S/S) design mix, treatment of the excavated materials, followed by placement, compaction, and covering of the treated material within the designated zone of the explosion berm shown in the design sketches.

1.2 RELATED REQUIREMENTS

1.2.1 Related work which is specified in other sections of the Technical Specifications includes, but is not limited to, the following:

- Earthwork for Structures and Pavements: Section 02221

1.3 REFERENCES

- American Society For Testing Materials, ASTM Method D1557 (Method C)
- Federal Regulations Concerning the Toxicity Characteristic Leaching Procedure; 40 CFR 261.24 and 40 CFR 261 Appendix 2.

1.4 SUBMITTALS

1.4.1 Remediation Work Plan: The Contractor shall include a S/S Plan addressing all S/S tasks associated with the remediation project. The S/S Plan shall contain a detailed description of how the work will be accomplished and shall contain at a minimum:

- A qualification statement demonstrating the Contractor's ability to successfully execute the project. At a minimum, the Contractor shall have planned and executed three similar projects, and he must provide a project manager with a minimum of two years of relevant experience.
- A treatability study plan designed to develop a design mix which demonstrates the ability to meet requirements of paragraph 3.2.1.3 of this Section. Upon completion of the treatability study, the results and recommendations shall be submitted to the Government Representative for approval. This plan shall have provisions for testing soils/sediments exhibiting the range of expected physical/chemical properties of site materials. Testing shall be completed on actual site samples taken from areas exhibiting high/low/representative silver concentrations, clay content, and organic content.

- The methodologies, procedures, and construction sequence to accomplish S/S of excavated soils/sediments including processing rates, equipment, stockpiling locations, and movement of material during S/S work activities.
- A construction schedule identifying the critical path for all S/S activities.
- Personnel requirements including names of supervisory personnel assigned to the project and the project organization.
- Equipment requirements.
- Construction quality control procedures to be implemented during remedial construction.
- Health and Safety procedures including material safety data sheets for prospective S/S reagents.

1.5 QUALITY ASSURANCE

1.5.1 Codes and Standards: All S/S work shall be completed in compliance with applicable requirements and regulations of governing authorities having jurisdiction.

1.5.2 Solidification/Stabilization Testing:

1.5.2.1 The Contractor shall provide quality control testing during S/S operations for the characteristics specified in paragraph 3.2.1.3 of this specification. All testing specified in this Section shall be executed in accordance with the specifications provided in Section 01410, Remedial Action Sampling and Analysis.

1.5.2.2 The Contractor shall demonstrate to the satisfaction of the Government Representative his/her ability to produce acceptable and consistent results. This shall be judged by the analysis of split samples of solidified/stabilized product for the characteristics specified in paragraph 3.2.1.3 of this specification. The split samples shall be prepared by the Contractor under the direction of the Government Representative, and submitted to the Government Representative for analysis. The results of the analysis will be compared to the Contractor's testing results. All analytical results, except for TCLP test results, shall be available one working day (24 hours) after sample acquisition. TCLP results shall be made available within seven working days of sample acquisition.

1.5.2.3 Results of all quality assurance and quality control tests performed during construction to be used for determining compliance with these specifications shall be submitted to the Government Representative. All analytical results, except for TCLP test results, shall be available one working day (24 hours) after sample acquisition. TCLP results shall be made available within seven working days of sample acquisition.

1.5.2.4 The Government Representative may request quality control and quality assurance samples to be collected at any time during S/S activities. Additional quality assurance and quality control sampling may be conducted by the Maryland Department of the Environment (MDE). All analytical results shall be available one working day (24 hours) after sample acquisition.

1.5.2.5 The Contractor's testing reports shall provide the basis for determination of compliance except as noted herein. A conflict shall occur if the quality assurance data do not agree with the Contractor's testing data with respect to the accept/reject criteria for characteristics specified in paragraph 3.2.1.3 of this specification. If, based on the quality assurance testing data, the Government Representative determines there is a conflict with the acceptance of the Contractor's data, the following activities shall occur:

- The Government Representative shall request an audit for all participating laboratories on all appropriate testing data for the treated material in question. The audit shall

examine all calculations, transcriptions, and procedures performed for errors. Results of the audit shall be submitted to the Government Representative no later than 24 hours after notification.

- If the audit does not produce a resolution of the conflicting data, then split samples or field retesting shall be taken at a location selected by the Government Representative which has previously been tested and complies with the acceptance criteria. Split sample testing shall be performed by the participating laboratories for the criterion in question and the results of the analyses shall be submitted to the Government Representative within 24 hours of sampling (seven days for TCLP testing). Field retesting results shall be submitted within one hour of testing. The test results will be used by the Government Representative to determine the validity of the test data in question.
- If there is agreement between participating laboratories on the split sample or field retesting results, the data for samples from the treated material in question are considered valid. The Government Representative shall consider two concurring results to be valid and the nonconcurring results to be invalid.
- Should the analytical results of the split samples or field retesting indicate that the participating laboratories are not producing consistent data, a detailed laboratory or field testing equipment audit shall be performed at each laboratory or for each piece of field testing equipment. Corrective measures, based on the audit, shall be undertaken to the satisfaction of the Government Representative. No data for the questionable parameter shall be considered valid in the subject evaluation area (for placed, treated material), areas submitted concurrently, or in subsequent areas pending acceptance of the detailed audit and corrective measures undertaken.

1.5.3 Job Conditions:

1.5.3.1 Existing Utilities: Locate all utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during remedial activities. Should uncharted or incorrectly charted piping or other utilities be encountered during work, consult the Government Representative immediately for directions as to procedure.

1.5.3.2 Protection of Persons and Property: Employ the exclusion zone concept during all treatment and placement activities. Protect the public, structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by S/S operations.

PART 2 - PRODUCTS

2.1 SOLIDIFICATION/STABILIZATION MATERIALS AND EQUIPMENT

2.1.1 The Contractor shall demonstrate the S/S reagents and mix design performance requirements of paragraph 3.2.1.3 by providing treatability test results for S/S of the site silver-contaminated soils and sediments.

2.1.2 The Contractor shall secure sufficient quantities of S/S reagent to insure construction activities progress without delay for purchase or delivery of the reagent to the job site.

2.1.3 The Contractor shall not use hazardous waste or materials for S/S reagents nor shall any hazardous waste materials be brought to the site.

2.1.4 The method of operations and specific equipment to be used shall be selected by the Contractor and described in the Remediation Work Plan. The S/S equipment shall be a self-contained, mobile unit which precludes contact of in-process material with environmental media. It shall be the Contractor's responsibility to utilize an efficient S/S system.

2.1.5 After S/S activities are completed, the Contractor shall completely remove all unused reagents from the site, and shall not dispose of any reagents on-site.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Examine the areas and conditions under which S/S is to be performed and notify the Government Representative in writing of conditions detrimental to the proper and timely completion of the work.

3.1.2 Prior to beginning of S/S activities in any area, ensure that all necessary clearing and subgrade preparation is completed in that area. Perform any necessary additional clearing and subgrade preparation activities.

3.2 SOLIDIFICATION/STABILIZATION

3.2.1 Preparation:

3.2.1.1 Utilize the mix design and methodologies delineated within the Remediation Work Plan and Treatability Study Report as authorized by the Government Representative to meet the performance requirements for the solidified/stabilized product.

3.2.1.2 Modify the mix design as necessary during S/S activities to achieve performance specifications. The Contractor shall inform the Government Representative prior to implementing changes to the mix design.

3.2.1.3 The solidified/stabilized material must exhibit Toxicity Characteristic Leaching Procedure (TCLP) test results for all analytes at concentrations below TCLP test criteria limits.

3.2.1.4 Unauthorized Solidification/Stabilization: Solidification/stabilization of materials other than those indicated in the design sketches or specified within these Technical Specifications and any additional material excavated to attain target cleanup levels, is prohibited without specific direction of the Government Representative.

3.2.1.5 Material Storage: The Contractor shall stockpile S/S reagents where directed. Reagents shall be placed, graded, shaped, or stored to minimize reagent loss, maintain reagent consistency for desired S/S performance, and comply with applicable requirements of governing bodies having jurisdiction.

3.2.1.6 Dust Control: The Contractor shall take measures to minimize fugitive dust emissions generated by S/S activities and contain/manage reagent to minimize blowing, spilling, and migration outside of storage areas via runoff, percolation, wind, or transfer between storage and transport equipment.

3.2.1.7 Cold Weather Conditions: The Contractor shall suspend S/S activities when ambient air temperatures fall below 40° F.

3.3 PLACEMENT, COMPACTION, AND CAPPING OF SOLIDIFIED/STABILIZED MATERIAL

3.3.1 Placement and Compaction: The Contractor shall place and compact the solidified/stabilized material within the zone designated for the expansion of the explosion berm as shown in the design sketches. Construction of the treated material bank shall consist of placing treated material in 6-inch loose lifts and compacting to at least 92% of the maximum obtained in the ASTM D1557 (Method C) Modified Proctor Test. Moisture content should be from zero to two percentage points above the optimal value. The placed and compacted material shall not have side slopes steeper than 3.0 horizontal to 1.0 vertical. The native soil under the material shall be disced or scarified so as to loosen the entire surface to a depth of four inches prior to placement of the first lift. Water shall be added, when necessary, at the time of scarifying to bring the material to within plus or minus two percent of optimum water content by ASTM D1557 test. Excess water shall be allowed to evaporate and the native soil rescarified prior to placement of the first lift. Immediately after scarifying, a layer of treated material shall be placed over the base and compacted as specified. Any material which fails to meet the specified minimum density shall be recompacted. Uniformly grade final layer of the solidified/stabilized material to provide an appropriate base for the bedding layer and soil cap.

3.3.2 Bedding Layer and Soil Cap: Upon placement and compaction of the final lift, a bedding layer (if needed) and a one-foot thick soil cover (after compaction) shall be installed by the Contractor. Material employed in the construction shall be consistent with requirements specified for backfill materials in Section 02221. Final grading and dressing of the installed cap shall be performed by the Contractor to the extent required to provide an appropriate base for construction of the berm expansion. Subsequent to final grading, the bank shall be protected from erosion utilizing an appropriate method, such as placement of matting.

3.3.3 Demobilization of Treatment Equipment: The Contractor shall not demobilize treatment equipment until all contaminated soils/sediments have been treated, placed, and accepted by the Government Representative. The Government's approval of the treated mixture shall be contingent on whether the mix conforms to the specified performance requirements.

3.4 FIELD QUALITY CONTROL

3.4.1 The Contractor shall collect and test solidified/stabilized product samples for approval by the Government Representative. Determination of compliance with the TCLP testing requirements of paragraph 3.2.1.3 of this specification shall be made by the Government Representative based on reports provided by the Contractor, except as noted in paragraph 1.4.2.5 of this specification.

3.4.2 The Contractor shall perform the following:

- Maintain daily logs of volumes of material solidified/stabilized, reagent deliveries, reagent quantities used, and other observations. Conduct visual observations of all incoming reagents throughout the project.
- Collect a minimum of one sample for TCLP testing per 1000 cubic yards of solidified/stabilized material. The Government Representative will randomly select ten percent of these samples for testing by the Contractor.
- For density testing, collect a minimum of six samples per lift of solidified/stabilized material. The Government Representative will randomly select samples for testing by the Contractor.
- Submit to the Government Representative the results of TCLP and density testing on representative samples of the treated material.

- If, as determined by the Government Representative's review of the test results, the solidified/stabilized material as placed within explosion berm as shown in the design sketches, does not meet specified requirements, the Contractor shall undertake necessary corrective actions and testing at no additional expense to the Government. The Contractor may retest a rejected area once prior to undertaking additional corrective actions.
- The area which will be considered rejected due to the failure of a sample to meet the performance criteria will be defined as the area encompassing the entire distance to surrounding sampling points which meet the performance criteria, and to a depth of the top surface of the next underlying complying lift.

3.5 CORRECTIVE ACTION

3.5.1 If the Contractor chooses to rework an area of treated and placed material which has been rejected for nonconformance with any of the performance criteria and it subsequently fails, the Contractor shall excavate the rejected area and re-solidify/re-stabilize it with additional material. The Contractor may rework a solidified/stabilized area rejected for nonconformance with the required specified performance criteria until it meets the specifications, provided that such work does not cause the area to deviate from the other requirements of conformance.

3.5.2 The expense for all corrective action shall be borne by the Contractor.

3.5.3 Prior to initiating S/S activities, the Contractor must notify the Government Representative if the physical nature of the solidified/stabilized product will prevent implementation of the corrective actions for areas failing performance specification within the designated testing periods. In this case, the Contractor shall notify the Government Representative in writing of corrective actions to be taken if areas fail to achieve performance specifications.

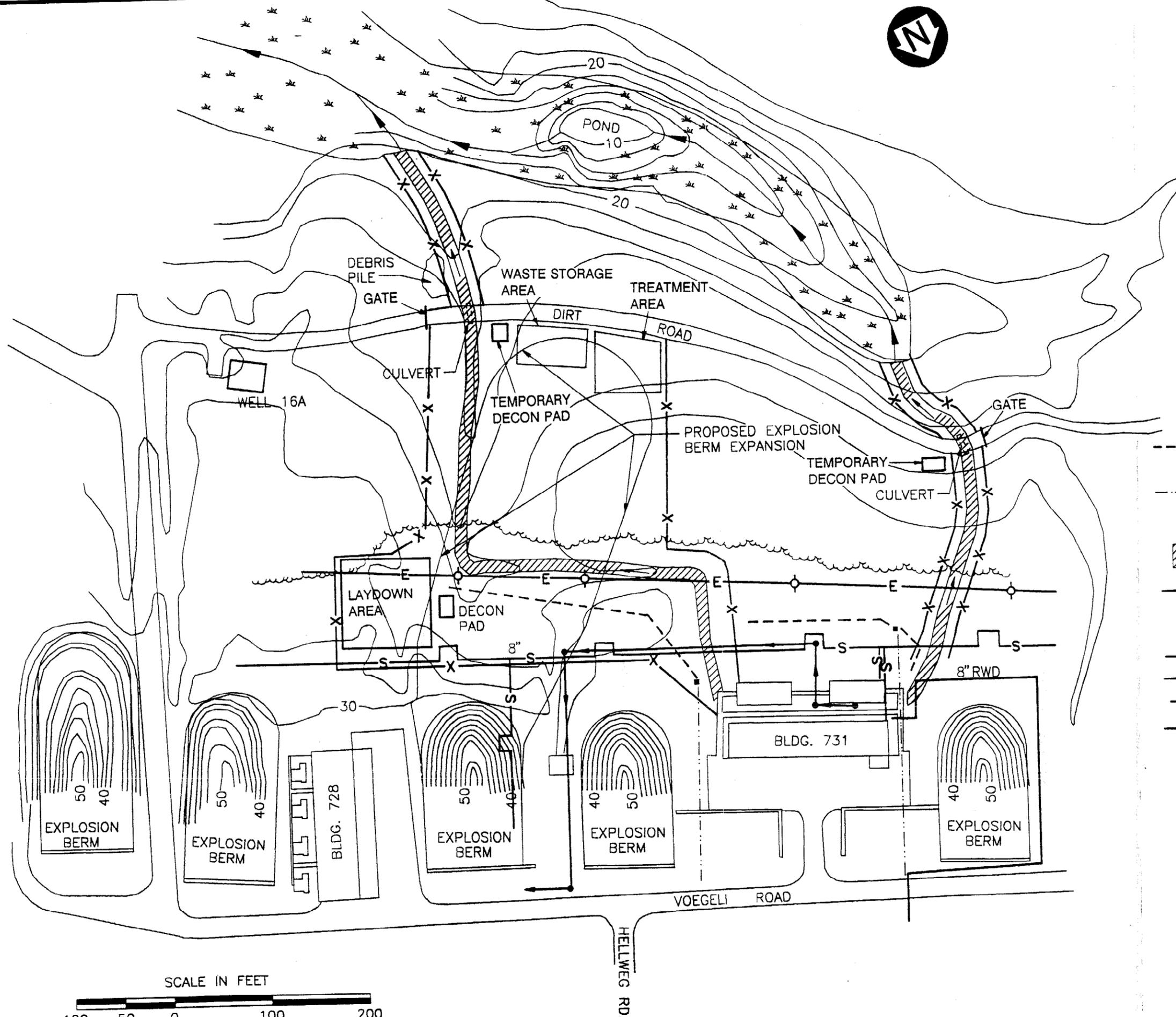
3.6 MAINTENANCE

3.6.1 Protection of Solidified/Stabilized Areas: Protect newly solidified/stabilized areas from erosion, and keep free of trash and debris. Repair and re-establish solidified/stabilized material in settled, eroded, and rutted areas to specified tolerances prior to cap placement.

3.6.2 Reconditioning Solidified/Stabilized Areas: Where completed solidification/stabilized areas are disturbed by subsequent construction operations or adverse weather, reshape and compact to required density and permeability prior to further construction.

END OF SECTION

SECTION 2
DESIGN SKETCHES



LEGEND

- TEMPORARY DRAINAGE DITCH W/ 4'x4'x4' CATCH BASIN
- - - - - TEMPORARY LINE TO DRAINAGE SWALE
- ** INDICATE WETLANDS
- /// APPROXIMATE AREA OF SEDIMENT EXCAVATION
- S- ABOVE GROUND STEAM LINE
- ~ TREE LINE
- 8" RWD RIVER WATER DISTRIBUTION
- X- FENCE TO BE INSTALLED
- SANITARY SEWER W/ MANHOLE
- E- ELECTRIC LINE W/POLE

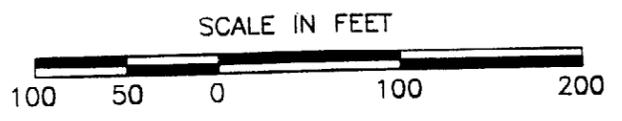


FIGURE 1
SITE MAP WITH DELINEATION OF
EXCAVATION ZONES
NOS INDIAN HEAD
INDIAN HEAD, MARYLAND

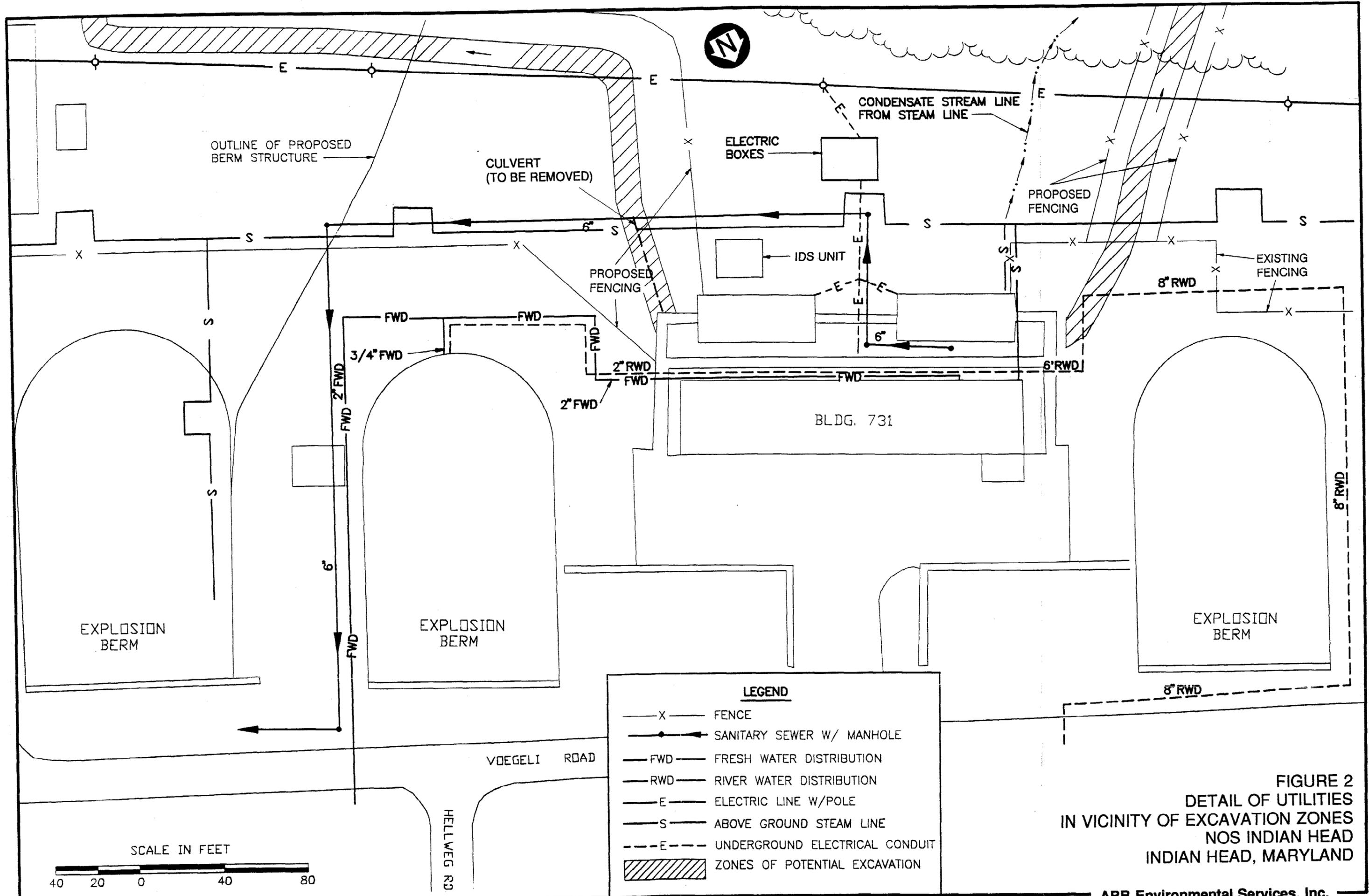


FIGURE 2
DETAIL OF UTILITIES
IN VICINITY OF EXCAVATION ZONES
NOS INDIAN HEAD
INDIAN HEAD, MARYLAND

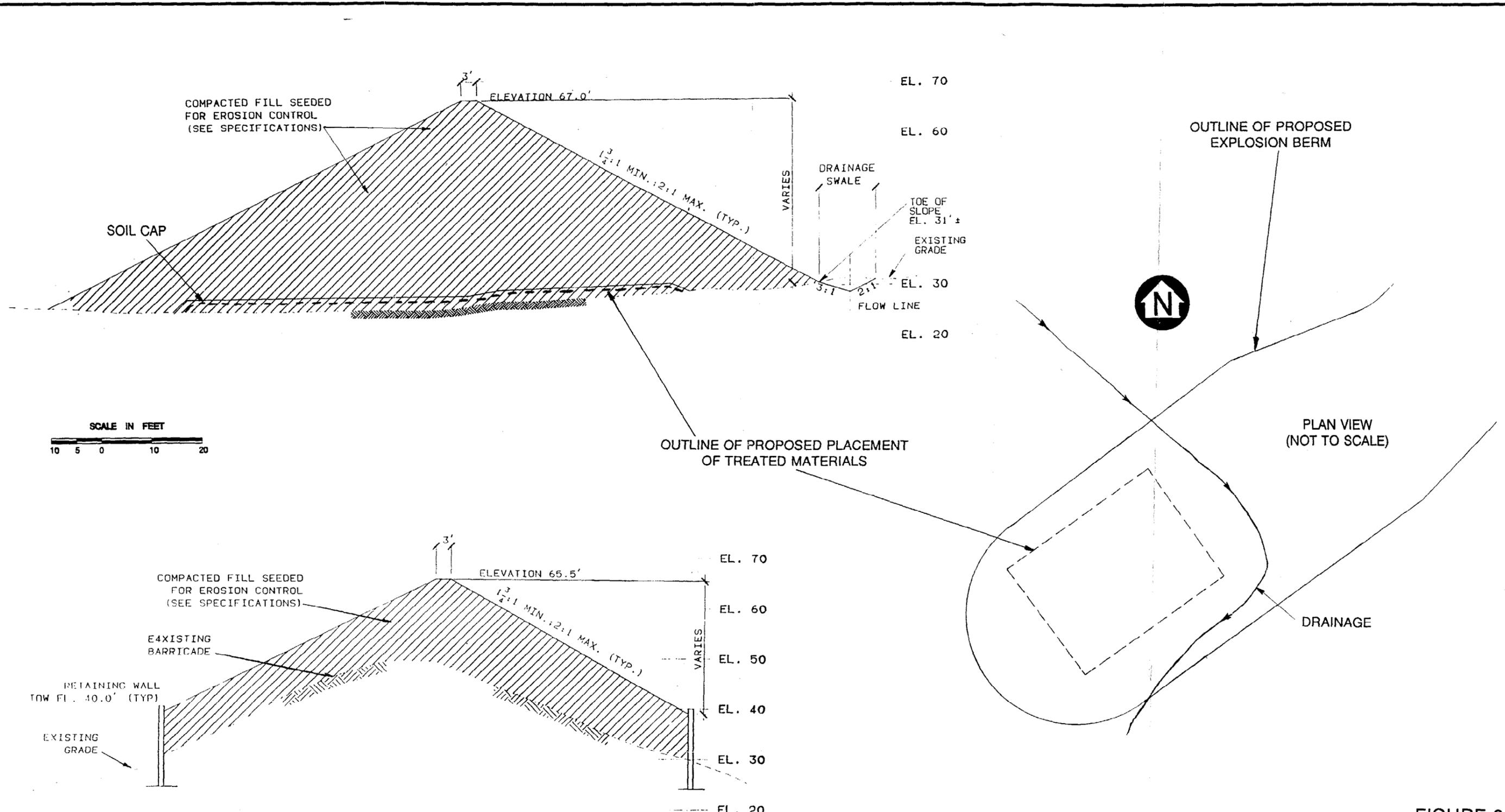


FIGURE 3
 CROSS-SECTIONAL VIEWS
 OF EXPLOSION BERM EXTENSION
 AND PLACEMENT OF TREATED MATERIALS
 NOS INDIAN HEAD
 INDIAN HEAD, MARYLAND

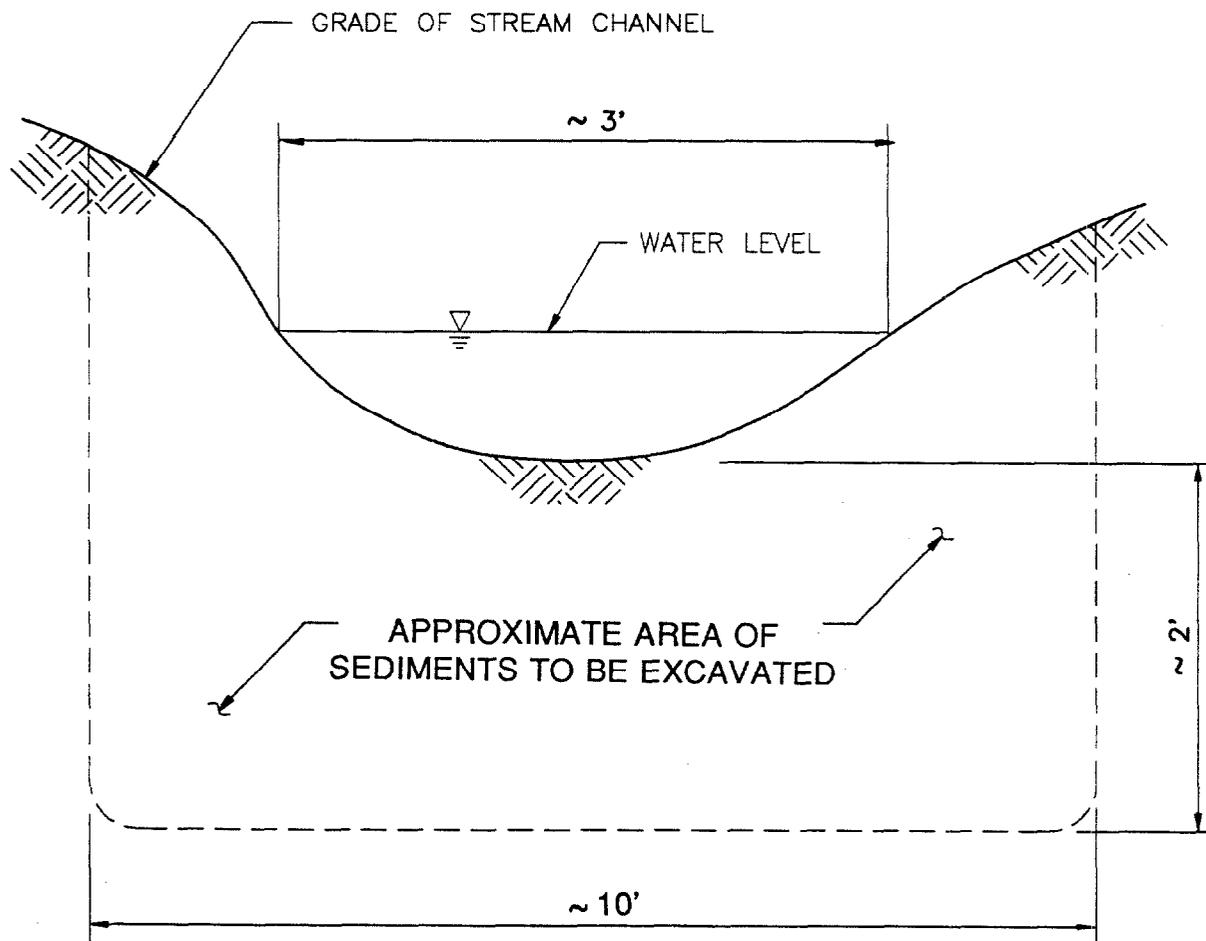


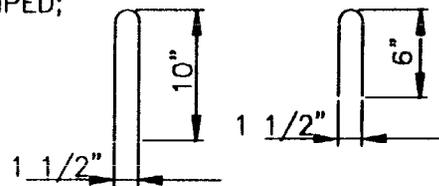
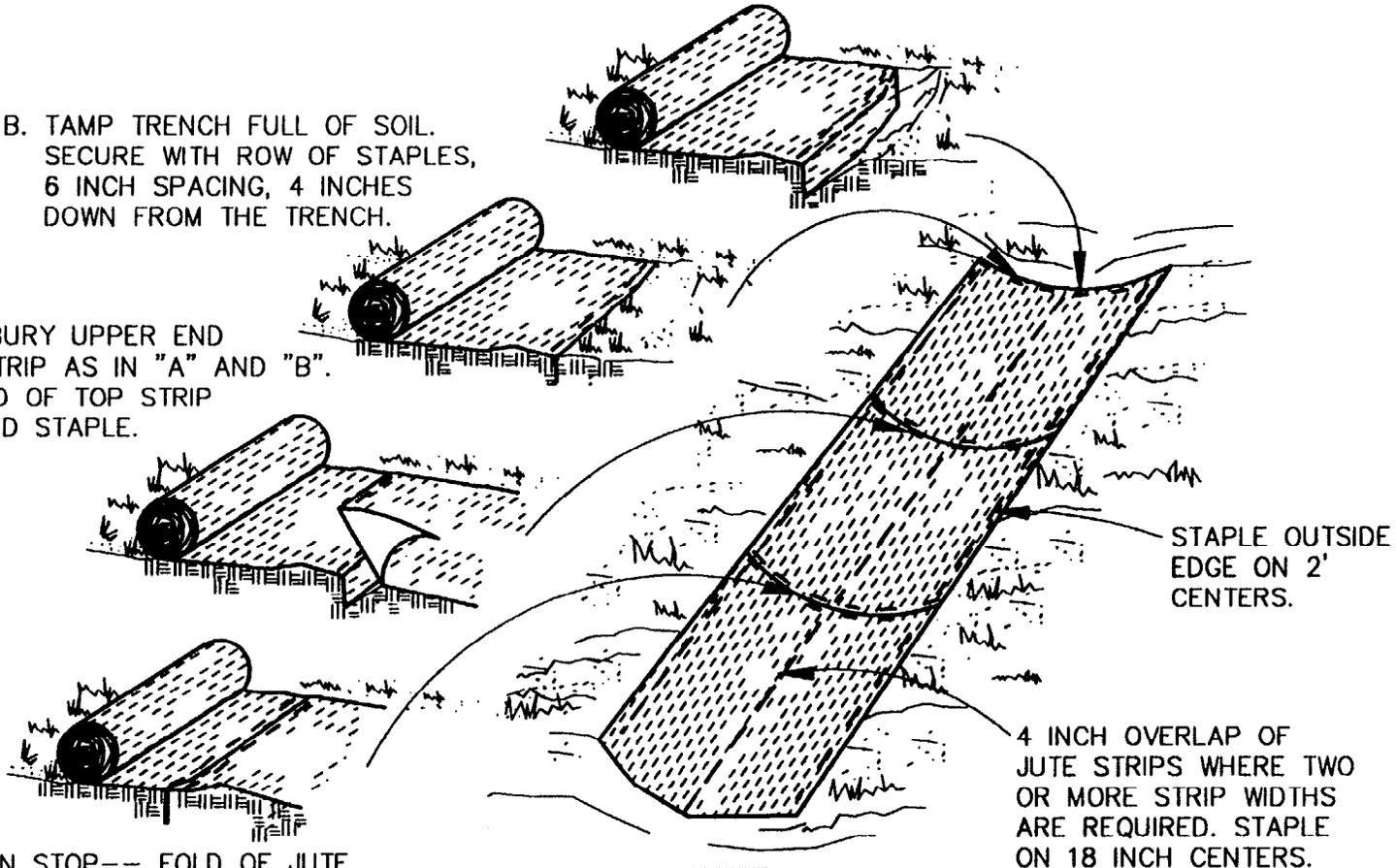
FIGURE 4
 CROSS-SECTIONAL VIEW OF
 STREAMBED EXCAVATION DIMENSIONS
 (NOT TO SCALE)
 NOS INDIAN HEAD
 INDIAN HEAD, MARYLAND

A. BURY THE TOP END OF THE JUTE STRIPS
IN A TRENCH 6 INCHES OR MORE IN DEPTH

B. TAMP TRENCH FULL OF SOIL.
SECURE WITH ROW OF STAPLES,
6 INCH SPACING, 4 INCHES
DOWN FROM THE TRENCH.

C. OVERLAP--BURY UPPER END
OF LOWER STRIP AS IN "A" AND "B".
OVERLAP END OF TOP STRIP
4 INCHES AND STAPLE.

D. EROSION STOP-- FOLD OF JUTE
BURIED IN SLIT TRENCH AND TAMPED;
DOUBLE ROW OF STAPLES.



TYPICAL STAPLES
NO. 11 GAUGE WIRE

FIGURE 5
TYPICAL JUTE THATCHING INSTALLATION
NOS INDIAN HEAD
INDIAN HEAD, MARYLAND

APPENDIX A

SOILS/SEDIMENTS CHARACTERIZATION DATA

GEOTECHNICAL DATA



+
BACKGROUND
SAMPLE

DRAINAGE FROM
BUILDING 731

0 + 60
SP 8

BUILDING 731

ROAD

VOEGLI

4 + 00
SP 7

0 + 40
SP 6

3 + 00
SP 5

OUTLINE OF
PROPOSED BERM
STRUCTURE

2 + 00
SP 4

1 + 20
SP 3

0 + 00
SP 1

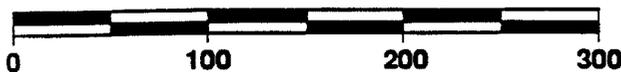
1 + 00
SP 2

BUILDING 728

LEGEND



SCALE IN FEET



**SAMPLING TRANSECT
LOCATIONS; SITE 5
NOS INDIAN HEAD**

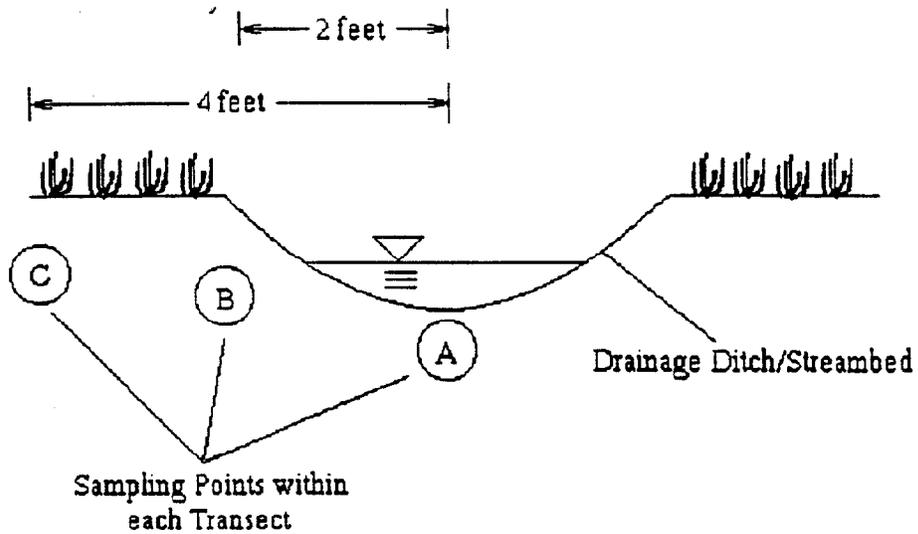
ABB Environmental Services, Inc.

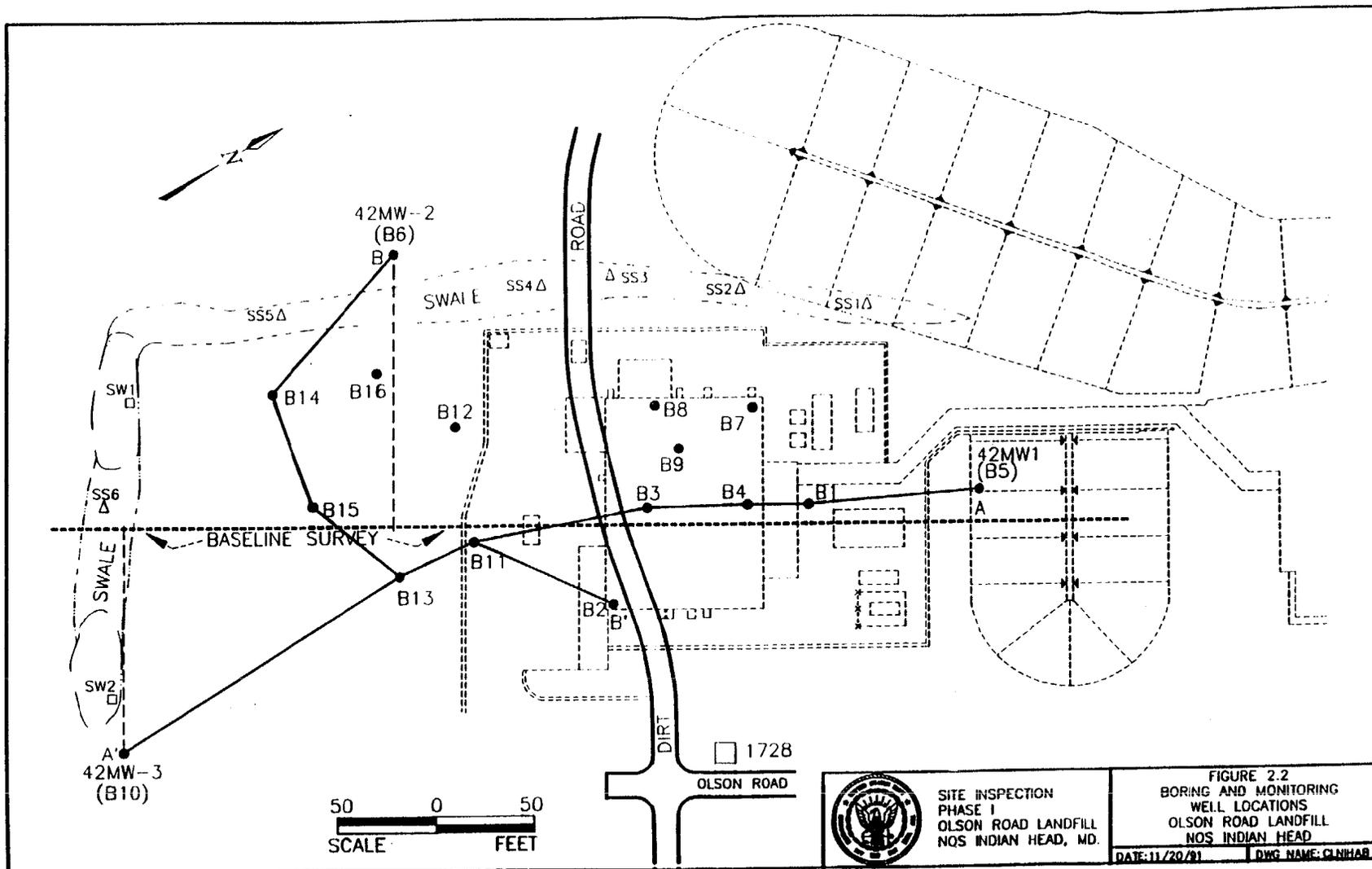
Silver Concentrations in Soil/Sediment Samples

	Depth	Silver Concentration (mg/kg)								BACK-GROUND
		SP 1	SP 2*	SP 3*	SP 4*	SP 5	SP 6	SP 7	SP 8	
Sampling Point A	0"	104	13	43	84	67	571	7.3	337	Below Detection Limits at Both Surface level and 18" Depth.
	18"	--	4.6	--	5.2	15	16	--	11	
Sampling Point B	0"	67	60	--	16	26	22	13	39	
	18"	--	3.1	7.7	2.9	6.8	3.1	--	13	
Sampling Point C	0"	12	37	--	11	11	32	7.7	144	
	18"	--	--	--	--	--	23	--	--	

*These locations are within the outline of the proposed explosion berm.
 -- = Below detection limit.

Schematic of Sampling Point Locations





SITE INSPECTION
 PHASE I
 OLSON ROAD LANDFILL
 NOS INDIAN HEAD, MD.

FIGURE 2.2
 BORING AND MONITORING
 WELL LOCATIONS
 OLSON ROAD LANDFILL
 NOS INDIAN HEAD

DATE: 11/20/91
 DWG NAME: CLNHAR

		SITE		INDIAN HEAD		INDIAN HEAD		INDIAN HEAD		INDIAN HEAD	
		SAMPLE		42SS-1		42SS-2		42SS-3		42SS-4	
		CCN: INORGANICS									
		MATRIX		SOIL		SOIL		SOIL		SOIL	
CAS: NO.	CL COMPOUND	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
7429-90-5	M Aluminum	3570		8060		13600		5130		8630	
7440-36-0	M Antimony	BDL	6	BDL	6	BDL	12	BDL	6	BDL	12
7440-38-2	M Arsenic	BDL	10	BDL	10	BDL	10	BDL	10	BDL	10
7440-39-3	M Barium	BDL	20		62		96		47		55
7440-41-7	M Beryllium	BDL	0.5	BDL	0.5	BDL	1	BDL	0.5	BDL	1
7440-43-8	M Cadmium	BDL	0.5		1		BDL		0.5		1
7440-70-2	M Calcium	BDL	500		1470		2220		1750		2880
7440-47-3	M Chromium		8		7		10		7		16
7440-48-4	M Cobalt	BDL	5		7		21	BDL	5	BDL	1
7440-50-8	M Copper		70		41		44		23		13
7439-89-8	M Iron	6060		14100		23700		10400		10900	
7439-82-1	M Lead		8		19		23		17		59
7439-85-4	M Magnesium	BDL	500		751	BDL	1000		769	BDL	1000
7439-86-5	M Manganese		68		398		592		243		270
7439-87-6	M Mercury	BDL	0.1	BDL	0.1	BDL	0.1	BDL	0.1		0
7440-02-0	M Nickel	BDL	4		9		13		11		10
7440-09-7	M Potassium	BDL	500	BDL	500	BDL	1000	BDL	500	BDL	1000
7782-49-2	M Selenium	BDL	5	BDL	5	BDL	5	BDL	5	BDL	5
7440-22-4	M Silver		202		151		177		27		10
7440-23-5	M Sodium	BDL	500	BDL	500	BDL	1000	BDL	500	BDL	1000
7440-28-0	M Thallium	BDL	1	BDL	1	BDL	1	BDL	1	BDL	1
7440-62-2	M Vanadium		8		18		24		15		23
7440-66-8	M Zinc		78		144		207		107		104
	M Cyanide	BDL	0.5	BDL	0.5	BDL	0.5	BDL	0.5	BDL	0.5

		SITE SAMPLE CCN: INORGANICS MATRIX	INDIAN HEAD 42SS-6	
CAS. NO.	CL. COMPOUND		SOIL mg/kg	
7429-90-6	M Aluminum		7240	
7440-36-0	M Antimony		BDL	6
7440-38-2	M Arsenic		BDL	10
7440-39-3	M Barium		90	
7440-41-7	M Beryllium		BDL	0.5
7440-43-8	M Cadmium		4	
7440-70-2	M Calcium		2120	
7440-47-3	M Chromium		9	
7440-48-4	M Cobalt		BDL	5
7440-50-8	M Copper		28	
7439-89-6	M Iron		2120	
7439-92-1	M Lead		17	
7439-96-4	M Magnesium		918	
7439-96-5	M Manganese		166	
7439-97-6	M Mercury		BDL	0.1
7440-02-0	M Nickel		18	
7440-09-7	M Potassium		901	
7782-49-2	M Selenium		BDL	5
7440-22-4	M Silver		99	
7440-23-5	M Sodium		BDL	500
7440-28-0	M Thallium		BDL	1
7440-62-2	M Vanadium		21	
7440-66-6	M Zinc		171	
	M Cyanide		BDL	0.5

CAS. NO.	CL COMPOUND	SITE SAMPLE		INDIAN HEAD		INDIAN HEAD		INDIAN HEAD		INDIAN HEAD	
		CCN: ORGANICS	MATRIX	42SS-1	42SS-2	42SS-3	42SS-4	42SS-5	SOIL ug/kg	SOIL ug/kg	SOIL ug/kg
74-87-3	V Chloromethane			BDL	10	BDL	10	BDL	10	BDL	10
74-83-9	V Bromomethane			BDL	10	BDL	10	BDL	10	BDL	10
75-01-4	V Vinyl Chloride			BDL	10	BDL	10	BDL	10	BDL	10
75-00-3	V Chloroethane			BDL	10	BDL	10	BDL	10	BDL	10
75-09-2	V Methylene Chloride			BDL	10	9	22	8		BDL	10
67-64-1	V Acetone			BDL	10	BDL	10	148		BDL	10
75-15-0	V Carbon Disulfide			BDL	10	BDL	10	BDL	10	BDL	10
75-35-4	V 1,1-Dichloroethane			BDL	10	BDL	10	BDL	10	BDL	10
75-34-3	V 1,1-Dichloroethane			BDL	10	BDL	10	BDL	10	BDL	10
540-59-0	V 1,2-Dichloroethane(total)			BDL	10	BDL	10	BDL	10	BDL	10
67-66-3	V Chloroform			BDL	10	BDL	10	BDL	10	BDL	10
107-06-2	V 1,2-Dichloroethane			BDL	10	BDL	10	BDL	10	BDL	10
78-93-3	V 2-Butanone			BDL	10	BDL	10	BDL	10	BDL	10
71-55-6	V 1,1,1-Trichloroethane			BDL	10	BDL	10	BDL	10	BDL	10
58-23-5	V Carbon Tetrachloride			BDL	10	BDL	10	BDL	10	BDL	10
75-27-4	V Bromodichloromethane			BDL	10	BDL	10	BDL	10	BDL	10
78-87-5	V 1,2-Dichloropropane			BDL	10	BDL	10	BDL	10	BDL	10
10061-01-5	V cis-1,3-Dichloropropene			BDL	10	BDL	10	BDL	10	BDL	10
79-01-6	V Trichloroethene			BDL	10	BDL	10	BDL	10	BDL	10
124-48-1	V Dibromochloromethane			BDL	10	BDL	10	BDL	10	BDL	10
79-00-6	V 1,1,2-Trichloroethane			BDL	10	BDL	10	BDL	10	BDL	10
71-43-2	V Benzene			BDL	10	BDL	10	BDL	10	BDL	10
10061-02-6	V Trans-1,3-Dichloropropene			BDL	10	BDL	10	BDL	10	BDL	10
75-25-2	V Bromoform			BDL	10	BDL	10	BDL	10	BDL	10
108-10-1	V 4-Methyl-2-Pentanone			BDL	10	BDL	10	BDL	10	BDL	10
591-78-6	V 2-Hexanone			BDL	10	BDL	10	BDL	10	BDL	10
127-18-4	V Tetrachloroethene			BDL	10	BDL	10	BDL	10	BDL	10
79-34-5	V 1,1,2,2-Tetrachloroethane			BDL	10	BDL	10	BDL	10	BDL	10
108-88-3	V Toluene		81			BDL	10	BDL	10	BDL	10
108-90-7	V Chlorobenzene			BDL	10	BDL	10	BDL	10	BDL	10
100-41-4	V Ethylbenzene		12			BDL	10	BDL	10	BDL	10
100-42-5	V Styrene			BDL	10	BDL	10	BDL	10	BDL	10
1330-20-7	V Xylenes (Total)			BDL	10	BDL	10	BDL	10	BDL	10
108-95-2	A Phenol			BDL	330	BDL	330	BDL	330	BDL	330
111-44-4	A Bis(2-Chloroethyl)ether			BDL	330	BDL	330	BDL	330	BDL	330
95-57-8	A 2-Chlorophenol			BDL	330	BDL	330	BDL	330	BDL	330
541-73-1	A 1,3-Dichlorobenzene			BDL	330	BDL	330	BDL	330	BDL	330
106-46-7	A 1,4-Dichlorobenzene			BDL	330	BDL	330	BDL	330	BDL	330
95-50-1	A 1,2-Dichlorobenzene			BDL	330	BDL	330	BDL	330	BDL	330
95-48-7	A 2-Methylphenol			BDL	330	BDL	330	BDL	330	BDL	330
108-90-1	A 2,2'-oxybis(1-Chloropropane)			BDL	330	BDL	330	BDL	330	BDL	330
106-44-6	A 4-Methylphenol			BDL	330	BDL	330	BDL	330	BDL	330
621-64-7	A N-Nitroso-di-n-propylamine			BDL	330	BDL	330	BDL	330	BDL	330
67-72-1	A Hexachloroethane			BDL	330	BDL	330	BDL	330	BDL	330
98-95-3	A Nitrobenzene			BDL	330	BDL	330	BDL	330	BDL	330
78-59-1	A Isophorone			BDL	330	BDL	330	BDL	330	BDL	330
88-75-5	A 2-Nitrophenol			BDL	330	BDL	330	BDL	330	BDL	330
105-67-9	A 2,4-Dimethylphenol			BDL	330	BDL	330	BDL	330	BDL	330
111-91-1	A Bis(2-Chloroethoxy)methane			BDL	330	BDL	330	BDL	330	BDL	330
120-83-2	A 2,4-Dichlorophenol			BDL	330	BDL	330	BDL	330	BDL	330
120-82-1	A 1,2,4-Trichlorobenzene			BDL	330	BDL	330	BDL	330	BDL	330
91-20-3	A Naphthalene			BDL	330	BDL	330	BDL	330	BDL	330
106-47-8	A 4-Chloroaniline			BDL	330	BDL	330	BDL	330	BDL	330
87-68-3	A Hexachlorobutadiene			BDL	330	BDL	330	BDL	330	BDL	330
59-50-7	A 4-Chloro-3-methylphenol			BDL	330	BDL	330	BDL	330	BDL	330
81-57-6	A 2-Methylnaphthalene			BDL	330	BDL	330	BDL	330	BDL	330
77-47-4	A Hexachlorocyclopentadiene			BDL	330	BDL	330	BDL	330	BDL	330
88-06-2	A 2,4,6-Trichlorophenol			BDL	330	BDL	330	BDL	330	BDL	330
95-95-4	A 2,4,5-Trichlorophenol			BDL	1600	BDL	1600	BDL	1600	BDL	1600
91-58-7	A 2-Chloronaphthalene			BDL	330	BDL	330	BDL	330	BDL	330
88-74-4	A 2-Nitroaniline			BDL	1600	BDL	1600	BDL	1600	BDL	1600
131-11-3	A Dimethylphthalate			BDL	330	BDL	330	BDL	330	BDL	330
208-96-8	A Acenaphthylene			BDL	330	BDL	330	BDL	330	BDL	330

CAS. NO.	CL COMPOUND	INDIAN HEAD 42SS-1		INDIAN HEAD 42SS-2		INDIAN HEAD 42SS-3		INDIAN HEAD 42SS-4		INDIAN HEAD 42SS-5	
		SOIL ug/kg		SOIL ug/kg		SOIL ug/kg		SOIL ug/kg		SOIL ug/kg	
606-20-2	A 2,6-Dinitrotoluene	BDL	330								
99-09-2	A 3-Nitroaniline	BDL	1600								
83-32-9	A Acenaphthene	BDL	330								
51-28-5	B 2,4-Dinitrophenol	BDL	1600								
100-02-7	B 4-Nitrophenol	BDL	1600								
132-64-9	B Dibenzofuran	BDL	330								
121-14-2	B 2,4-Dinitrotoluene	BDL	330								
84-66-2	B Diethylphthalate	BDL	330								
7005-72-3	B 4-Chlorophenyl-phenylether	BDL	330								
86-73-7	B Fluorene	BDL	330								
100-01-6	B 4-Nitroaniline	BDL	1600								
534-62-1	B 4,6-Dinitro-2-methylphenol	BDL	1600								
86-30-6	B N-Nitrosodiphenylamine(1)	BDL	330								
101-55-3	B 4-Bromophenyl-phenylether	BDL	330								
118-74-1	B Hexachlorobenzene	BDL	330								
87-86-5	B Pentachlorophenol	BDL	1600								
85-01-8	B Phenanthrene	BDL	330								
120-12-7	B Anthracene	BDL	330								
86-74-8	B Carbazole	BDL	330								
84-74-2	B Di-n-butylphthalate		606		572	BDL	330		243		250
206-44-0	B Fluoranthene	BDL	330								
129-00-0	B Pyrene	BDL	330								
85-68-7	B Butylbenzylphthalate	BDL	330								
81-84-1	B 3,3'-Dichlorobenzidine	BDL	660								
56-65-3	B Benzo(a)anthracene	BDL	330								
218-01-9	B Chrysene	BDL	330								
117-81-7	B bis(2-Ethylhexyl)phthalate	BDL	330								
117-84-0	B Di-n-octylphthalate	BDL	330								
205-89-2	B Benzo(b)fluoranthene	BDL	330								
207-08-9	B Benzo(k)fluoranthene	BDL	330								
50-32-8	B Benzo(a)pyrene	BDL	330								
193-39-5	B Indeno(1,2,3-cd)pyrene	BDL	330								
53-70-3	B Dibenz(a,h)anthracene	BDL	330								
191-24-2	B Benzo(g,h,i)perylene	BDL	330								
319-84-6	P Alpha-BHC	BDL	1.7								
319-85-7	P Beta-BHC		3	BDL	1.7	BDL	1.7	BDL	1.7	BDL	1.7
319-86-8	P Delta-BHC	BDL	1.7								
58-89-9	P Gamma-BHC (Lindane)	BDL	1.7								
76-44-8	P Heptachlor	BDL	1.7								
309-00-2	P Aldrin	BDL	1.7								
1024-57-3	P Heptachlor epoxide	BDL	1.7	BDL	1.7	BDL	1.7		4	BDL	1.7
959-08-8	P Endosulfan I	BDL	1.7								
80-57-1	P Dieldrin	BDL	3.3								
72-55-9	P 4,4'-DDE	BDL	3.3								
72-20-8	P Eridrin		6	BDL	3.3	BDL	3.3	BDL	3.3	BDL	3.3
33213-65-9	P Endosulfan II	BDL	3.3								
72-54-8	P 4,4'-DDD	BDL	3.3								
1031-07-8	P Endosulfan sulfate		42	BDL	3.3		18		40	BDL	3.3
50-29-3	P 4,4'-DDT		40	BDL	3.3	BDL	3.3		24	BDL	3.3
72-43-5	P Methoxychlor	BDL	17								
53494-70-5	P Endrin ketone	BDL	3.3								
7421-36-3	P Endrin aldehyde	BDL	3.3								
5103-71-9	P Alpha-Chlordane	BDL	1.7								
5103-74-2	P Gamma-Chlordane	BDL	1.7								
8001-35-2	P Toxaphene	BDL	170								
12674-11-2	P Aroclor-1016	BDL	33								
11104-28-2	P Aroclor-1221	BDL	67								
11141-16-5	P Aroclor-1232	BDL	33								
53489-21-9	P Aroclor-1242	BDL	33								
12672-29-6	P Aroclor-1248	BDL	33								
11097-89-1	P Aroclor-1254	BDL	33								
11096-82-5	P Aroclor-1260	BDL	33								

		SITE SAMPLE CCN: ORGANICS MATRIX	INDIAN HEAD 42SS-6	
CAS. NO.	CL. COMPOUND		SOIL ug/kg	
74-87-3	V Chloromethane		BDL	10
74-83-9	V Bromomethane		BDL	10
75-01-4	V Vinyl Chloride		BDL	10
75-00-3	V Chloroethane		BDL	10
75-09-2	V Methylene Chloride		BDL	10
67-64-1	V Acetone		194	
75-15-0	V Carbon Disulfide		BDL	10
75-35-4	V 1,1-Dichloroethene		BDL	10
75-34-3	V 1,1-Dichloroethane		BDL	10
540-59-0	V 1,2-Dichloroethene(total)		BDL	10
67-66-3	V Chloroform		BDL	10
107-06-2	V 1,2-Dichloroethane		BDL	10
76-83-3	V 2-Butanone		BDL	10
71-55-6	V 1,1,1-Trichloroethane		BDL	10
56-23-5	V Carbon Tetrachloride		BDL	10
75-27-4	V Bromodichloromethane		BDL	10
78-87-5	V 1,2-Dichloropropane		BDL	10
10061-01-5	V cis-1,3-Dichloropropene		BDL	10
79-01-6	V Trichloroethene		BDL	10
124-48-1	V Dibromochloromethane		BDL	10
79-00-6	V 1,1,2-Trichloroethane		BDL	10
71-43-2	V Benzene		BDL	10
10061-02-6	V Trans-1,3-Dichloropropene		BDL	10
75-25-2	V Bromoform		BDL	10
108-10-1	V 4-Methyl-2-Pentanone		BDL	10
591-78-6	V 2-Hexanone		BDL	10
127-18-4	V Tetrachloroethene		BDL	10
79-34-5	V 1,1,2,2-Tetrachloroethane		BDL	10
108-88-3	V Toluene		BDL	10
108-90-7	V Chlorobenzene		BDL	10
100-41-4	V Ethylbenzene		BDL	10
100-42-5	V Styrene		BDL	10
1330-20-7	V Xylenes (Total)		BDL	10
108-95-2	A Phenol		BDL	330
111-44-4	A Bis(2-Chloroethyl)ether		BDL	330
95-57-8	A 2-Chlorophenol		BDL	330
541-73-1	A 1,3-Dichlorobenzene		BDL	330
106-46-7	A 1,4-Dichlorobenzene		BDL	330
95-50-1	A 1,2-Dichlorobenzene		BDL	330
95-48-7	A 2-Methylphenol		BDL	330
108-90-1	A 2,2'-oxybis(1-Chloropropane)		BDL	330
106-44-5	A 4-Methylphenol		BDL	330
621-84-7	A N-Nitrosodi-n-propylamine		BDL	330
67-72-1	A Hexachloroethane		BDL	330
98-95-3	A Nitrobenzene		BDL	330
78-59-1	A Isophorone		BDL	330
88-75-5	A 2-Nitrophenol		BDL	330
105-67-9	A 2,4-Dimethylphenol		BDL	330
111-91-1	A Bis(2-Chloroethoxy)methane		BDL	330
120-83-2	A 2,4-Dichlorophenol		BDL	330
120-82-1	A 1,2,4-Trichlorobenzene		BDL	330
91-20-3	A Naphthalene		BDL	330
106-47-8	A 4-Chloroaniline		BDL	330
87-68-3	A Hexachlorobutadiene		BDL	330
59-50-7	A 4-Chloro-3-methylphenol		BDL	330
91-57-6	A 2-Methylnaphthalene		BDL	330
77-47-4	A Hexachlorocyclopentadiene		BDL	330
88-06-2	A 2,4,6-Trichlorophenol		BDL	330
95-95-4	A 2,4,5-Trichlorophenol		BDL	1600
91-55-7	A 2-Chloronaphthalene		BDL	330
88-74-4	A 2-Nitroaniline		BDL	1600
131-11-3	A Dimethylphthalate		BDL	330
208-06-8	A Acenaphthylene		BDL	330

		SITE SAMPLE CCN: ORGANICS MATRIX	INDIAN HEAD 42SS-6	
CAS. NO.	CL COMPOUND		SOIL ug/kg	
606-20-2	A 2,6-Dinitrotoluene		BDL	330
99-09-2	A 3-Nitroaniline		BDL	1600
83-32-9	A Acenaphthene		BDL	330
51-28-5	B 2,4-Dinitrophenol		BDL	1600
100-02-7	B 4-Nitrophenol		BDL	1600
132-84-9	B Dibenzofuran		BDL	330
121-14-2	B 2,4-Dinitrotoluene		BDL	330
84-66-2	B Diethylphthalate		BDL	330
7005-72-3	B 4-Chlorophenyl-phenylether		BDL	330
86-73-7	B Fluorene		BDL	330
100-01-6	B 4-Nitroaniline		BDL	1600
534-52-1	B 4,6-Dinitro-2-methylphenol		BDL	1600
86-30-6	B N-Nitrosodiphenylamine(1)		BDL	330
101-65-3	B 4-Bromophenyl-phenylether		BDL	330
118-74-1	B Hexachlorobenzene		BDL	330
87-86-5	B Pentachlorophenol		BDL	1600
85-01-8	B Phenanthrene		BDL	330
120-12-7	B Anthracene		BDL	330
86-74-8	B Carbazole		BDL	330
84-74-2	B Di-n-butylphthalate		BDL	330
206-44-0	B Fluoranthene		BDL	330
129-00-0	B Pyrene		BDL	330
85-68-7	B Butylbenzylphthalate		BDL	330
91-94-1	B 3,3'-Dichlorobenzidine		BDL	660
58-55-3	B Benzo(a)anthracene		BDL	330
218-01-9	B Chrysene		BDL	330
117-81-7	B bis(2-Ethylhexyl)phthalate		BDL	330
117-84-0	B Di-n-octylphthalate		BDL	330
205-99-2	B Benzo(b)fluoranthene		BDL	330
207-08-9	B Benzo(k)fluoranthene		BDL	330
50-32-8	B Benzo(a)pyrene		BDL	330
193-39-5	B indeno(1,2,3-cd)pyrene		BDL	330
53-70-3	B Dibenz(a,h)anthracene		BDL	330
191-24-2	B Benzo(g,h,i)perylene		BDL	330
319-84-6	P Alpha-BHC		BDL	1.7
319-85-7	P Beta-BHC		BDL	1.7
319-86-8	P Delta-BHC		BDL	1.7
58-89-9	P Gamma-BHC (Lindane)		BDL	1.7
78-44-8	P Heptachlor		BDL	1.7
309-00-2	P Aldrin		BDL	1.7
1024-57-3	P Heptachlor epoxide		BDL	1.7
950-08-8	P Endosulfan I			5
60-57-1	P Dieldrin		BDL	3.3
72-65-9	P 4,4'-DDE		BDL	3.3
72-20-8	P Endrin		BDL	3.3
33213-65-9	P Endosulfan II		BDL	3.3
72-54-8	P 4,4'-DDD		BDL	3.3
1031-07-8	P Endosulfan sulfate		BDL	3.3
50-29-3	P 4,4'-DDT		BDL	3.3
72-43-5	P Methoxychlor		BDL	17
53494-70-5	P Endrin ketone		BDL	3.3
7421-36-3	P Endrin aldehyde		BDL	3.3
5103-71-9	P Alpha-Chlordane		BDL	1.7
5103-74-2	P Gamma-Chlordane		BDL	1.7
8001-35-2	P Toxophene		BDL	170
12674-11-2	P Aroclor-1018		BDL	33
11104-28-2	P Aroclor-1221		BDL	67
11141-16-5	P Aroclor-1232		BDL	33
53489-21-0	P Aroclor-1243		BDL	33
12672-29-6	P Aroclor-1248		BDL	33
11097-89-1	P Aroclor-1254		BDL	33
11096-82-5	P Aroclor-1260		BDL	33

SITE SAMPLE CCN: INORGANICS/ORGANICS DATE DEPTH MATRIX	INDIAN HEAD 42MW-3		INDIAN HEAD 42SW-1		INDIAN HEAD 42SW-2	
	WATER ug/l		WATER ug/l		WATER ug/l	
CAS. NO.: CL COMPOUND						
7429-00-6 M. Aluminum	340		BDL	200	3940	
7440-36-0 M. Antimony	BDL	60	BDL	60	BDL	60
7440-38-2 M. Arsenic	BDL	10	BDL	10	24	
7440-39-3 M. Barium	230		BDL	200	1100	
7440-41-7 M. Beryllium	BDL	5	BDL	5	BDL	5
7440-43-9 M. Cadmium	BDL	5	BDL	5	28	
7440-70-2 M. Calcium	15000		18000		56000	
7440-47-3 M. Chromium	BDL	10	BDL	10	BDL	10
7440-48-4 M. Cobalt	BDL	50	BDL	50	62	
7440-50-8 M. Copper	BDL	25	BDL	25	51	
7439-89-8 M. Iron	18000		20000		30000	
7439-02-1 M. Lead	4		3.8		280	
7439-85-4 M. Magnesium	5620		BDL	5000	10000	
7439-06-5 M. Manganese	6120		840		8400	
7439-97-8 M. Mercury	BDL	0.2	BDL	0.2	0.7	
7440-02-0 M. Nickel	BDL	40	BDL	40	59	
7440-09-7 M. Potassium	BDL	5000	5800		6200	
7782-49-2 M. Selenium	BDL	5	BDL	5	BDL	5
7440-22-4 M. Silver	BDL	10	BDL	10	BDL	10
7440-23-5 M. Sodium	13000		26000		37000	
7440-28-0 M. Thallium	bdl	0	BDL	5	BDL	5
7440-62-2 M. Vanadium	BDL	50	BDL	50	BDL	50
7440-66-8 M. Zinc	BDL	20	52		1300	
M. Cyanide	BDL	0.005	BDL	0.005	BDL	0.005

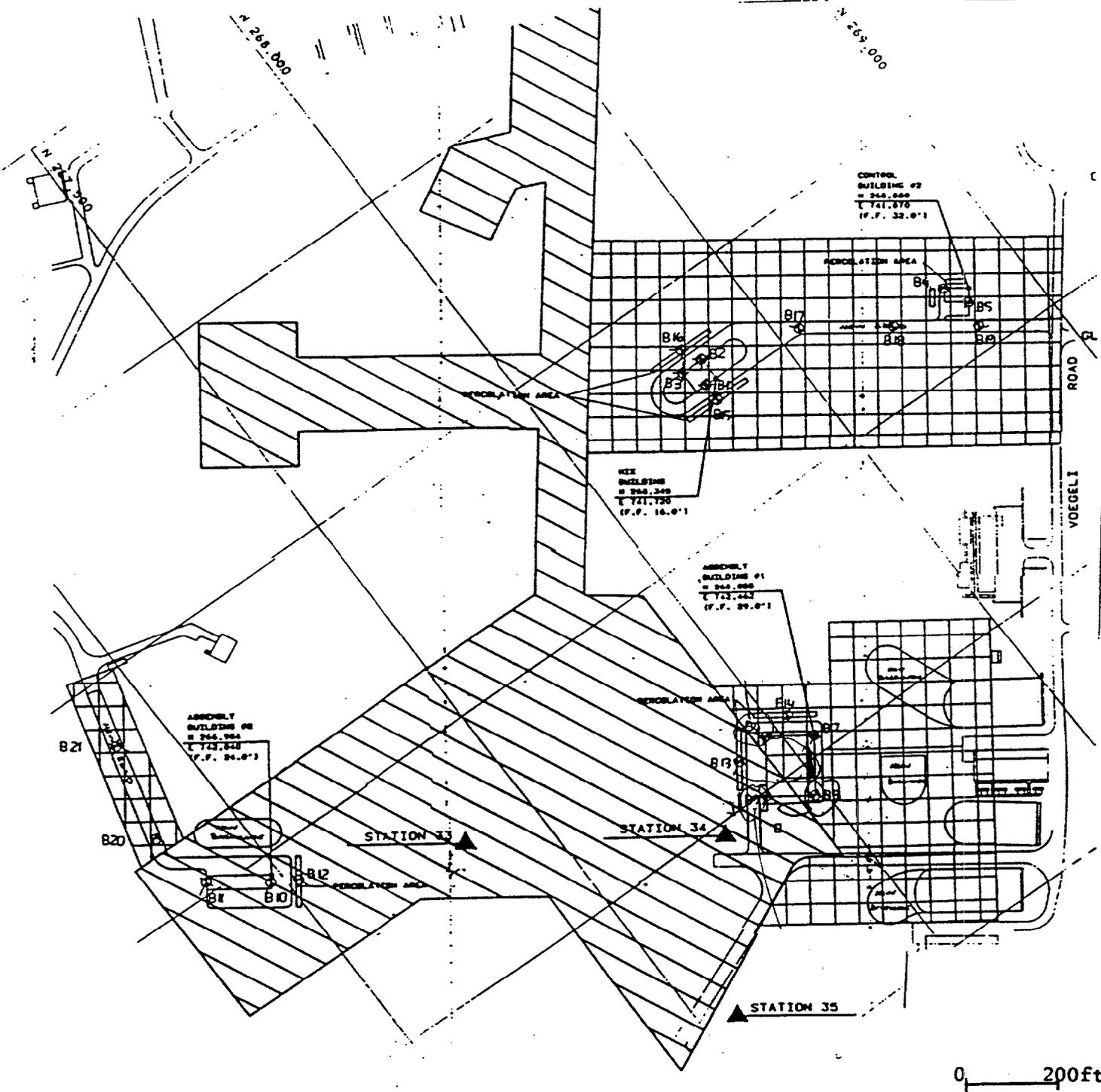
CAS. NO.	CL COMPOUND	SITE	INDIAN HEAD		INDIAN HEAD		INDIAN HEAD	
		SAMPLE	42MW-3	42SW-1	42SW-1	42SW-2	42SW-2	
CCN: INORGANICS/ORGANICS		DATE						
		DEPTH						
		MATRIX	WATER	WATER	WATER	WATER	WATER	WATER
			ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
74-87-3	V Chloromethane		BDL	10	BDL	10	BDL	10
74-83-9	V Bromomethane		BDL	10	BDL	10	BDL	10
75-01-4	V Vinyl Chloride		BDL	10	BDL	10	BDL	10
75-00-3	V Chloroethane		BDL	10	BDL	10	BDL	10
75-09-2	V Methylene Chloride		BDL	10	BDL	10	BDL	10
67-84-1	V Acetone		BDL	10	BDL	10	BDL	10
75-16-0	V Carbon Disulfide		BDL	10	BDL	10	BDL	10
75-35-4	V 1,1-Dichloroethane		BDL	10	BDL	10	BDL	10
75-34-3	V 1,1-Dichloroethane		BDL	10	BDL	10	BDL	10
540-59-0	V 1,2-Dichloroethane(total)		BDL	10	BDL	10	BDL	10
67-86-3	V Chloroform		BDL	10	BDL	10	BDL	10
107-06-2	V 1,2-Dichloroethane		BDL	10	BDL	10	BDL	10
78-03-3	V 2-Butanone		BDL	10	BDL	10	BDL	10
71-55-6	V 1,1,1-Trichloroethane		BDL	10	BDL	10	BDL	10
56-23-5	V Carbon Tetrachloride		BDL	10	BDL	10	BDL	10
75-27-4	V Bromodichloromethane		BDL	10	BDL	10	BDL	10
78-87-5	V 1,2-Dichloropropane		BDL	10	BDL	10	BDL	10
10061-01-5	V cis-1,3-Dichloropropene		BDL	10	BDL	10	BDL	10
79-01-6	V Trichloroethene		BDL	10	BDL	10	BDL	10
124-48-1	V Dibromochloromethane		BDL	10	BDL	10	BDL	10
79-00-5	V 1,1,2-Trichloroethane		BDL	10	BDL	10	BDL	10
71-43-2	V Benzene		BDL	10	BDL	10	BDL	10
10061-02-6	V Trans-1,3-Dichloropropene		BDL	10	BDL	10	BDL	10
75-25-2	V Bromoform		BDL	10	BDL	10	BDL	10
108-10-1	V 4-Methyl-2-Pentanone		BDL	10	BDL	10	BDL	10
591-78-6	V 2-Hexanone		BDL	10	BDL	10	BDL	10
127-18-4	V Tetrachloroethene		BDL	10	BDL	10	BDL	10
78-34-5	V 1,1,2,2-Tetrachloroethane		BDL	10	BDL	10	BDL	10
108-88-3	V Toluene		BDL	10	BDL	10	BDL	10
108-90-7	V Chlorobenzene		BDL	10	BDL	10	BDL	10
100-41-4	V Ethylbenzene		BDL	10	BDL	10	BDL	10
100-42-5	V Styrene		BDL	10	BDL	10	BDL	10
1330-20-7	V Xylenes (Total)		BDL	10	BDL	10	BDL	10
108-95-2	A Phenol		BDL	10	BDL	10	BDL	10
111-44-4	A Bis(2-Chloroethyl)ether		BDL	10	BDL	10	BDL	10
95-57-8	A 2-Chlorophenol		BDL	10	BDL	10	BDL	10
541-73-1	A 1,3-Dichlorobenzene		BDL	10	BDL	10	BDL	10
106-46-7	A 1,4-Dichlorobenzene		BDL	10	BDL	10	BDL	10
85-50-1	A 1,2-Dichlorobenzene		BDL	10	BDL	10	BDL	10
95-48-7	A 2-Methylphenol		BDL	10	BDL	10	BDL	10
108-90-1	A 2,2'-oxybis(1-Chloropropane)		BDL	10	BDL	10	BDL	10
106-44-5	A 4-Methylphenol		BDL	10	BDL	10	BDL	10
621-64-7	A N-Nitroso-di-n-propylamine		BDL	10	BDL	10	BDL	10
67-72-1	A Hexachloroethane		BDL	10	BDL	10	BDL	10
98-95-3	A Nitrobenzene		BDL	10	BDL	10	BDL	10
78-59-1	A Isophorone		BDL	10	BDL	10	BDL	10
88-75-5	A 2-Nitrophenol		BDL	10	BDL	10	BDL	10
105-67-9	A 2,4-Dimethylphenol		BDL	10	BDL	10	BDL	10
111-91-1	A Bis(2-Chloroethoxy)methane		BDL	10	BDL	10	BDL	10
120-83-2	A 2,4-Dichlorophenol		BDL	10	BDL	10	BDL	10
120-82-1	A 1,2,4-Trichlorobenzene		BDL	10	BDL	10	BDL	10
91-20-3	A Naphthalene		BDL	10	BDL	10	BDL	10
106-47-8	A 4-Chloroaniline		BDL	10	BDL	10	BDL	10
67-68-3	A Hexachlorobutadiene		BDL	10	BDL	10	BDL	10
69-60-7	A 4-Chloro-3-methylphenol		BDL	10	BDL	10	BDL	10
91-57-8	A 2-Methylnaphthalene		BDL	10	BDL	10	BDL	10
77-47-4	A Hexachlorocyclopentadiene		BDL	10	BDL	10	BDL	10
88-06-2	A 2,4,6-Trichlorophenol		BDL	10	BDL	10	BDL	10
95-95-4	A 2,4,5-Trichlorophenol		BDL	50	BDL	50	BDL	50
91-58-7	A 2-Chloronaphthalene		BDL	10	BDL	10	BDL	10
88-74-4	A 2-Nitrothiophene		BDL	50	BDL	50	BDL	50

Phase I Site Inspection, NOS Indian Head, MD Groundwater Sample

CAS. NO.	CL COMPOUND	SITE	INDIAN HEAD	INDIAN HEAD	INDIAN HEAD
		SAMPLE	42MW-3	42SW-1	42SW-2
CCN: INORGANICS/ORGANICS					
DATE					
DEPTH					
MATRIX					
		WATER	WATER	WATER	
		ug/l	ug/l	ug/l	
131-11-3	A Dimethylphthalate	BDL	10	BDL	10
208-86-8	A Acenaphthylene	BDL	10	BDL	10
606-20-2	A 2,6-Dinitrotoluene	BDL	10	BDL	10
99-09-2	A 3-Nitroaniline	BDL	50	BDL	50
83-82-9	A Acenaphthene	BDL	10	BDL	10
51-28-5	B 2,4-Dinitrophenol	BDL	50	BDL	50
100-02-7	B 4-Nitrophenol	BDL	50	BDL	50
132-84-9	B Dibenzofuran	BDL	10	BDL	10
121-14-2	B 2,4-Dinitrotoluene	BDL	10	BDL	10
84-66-2	B Diethylphthalate	BDL	10	BDL	10
7005-72-3	B 4-Chlorophenyl-phenylether	BDL	10	BDL	10
86-73-7	B Fluorene	BDL	10	BDL	10
100-01-6	B 4-Nitroaniline	BDL	50	BDL	50
534-52-1	B 4,6-Dinitro-2-methylphenol	BDL	50	BDL	50
86-30-6	B N-Nitrosodiphenylamine(1)	BDL	10	BDL	10
101-55-3	B 4-Bromophenyl-phenylether	BDL	10	BDL	10
118-74-1	B Hexachlorobenzene	BDL	10	BDL	10
87-86-5	B Pentachlorophenol	BDL	50	BDL	50
85-01-8	B Phenanthrene	BDL	10	BDL	10
120-12-7	B Anthracene	BDL	10	BDL	10
86-74-8	B Carbazole	BDL	10	BDL	10
84-74-2	B Di-n-butylphthalate		9	25	19
206-44-0	B Fluoranthene	BDL	10	BDL	10
129-00-0	B Pyrene	BDL	10	BDL	10
85-68-7	B Butylbenzylphthalate	BDL	10	BDL	10
91-84-1	B 3,3'-Dichlorobenzidine	BDL	20	BDL	20
56-55-3	B Benzo(a)anthracene	BDL	10	BDL	10
218-01-9	B Chrysene	BDL	10	BDL	10
117-81-7	B bis(2-Ethylhexyl)phthalate	BDL	10	BDL	10
117-84-0	B Di-n-octylphthalate	BDL	10	BDL	10
205-99-2	B Benzo(b)fluoranthene	BDL	10	BDL	10
207-08-9	B Benzo(k)fluoranthene	BDL	10	BDL	10
50-32-8	B Benzo(a)pyrene	BDL	10	BDL	10
193-39-5	B Indeno(1,2,3-cd)pyrene	BDL	10	BDL	10
53-70-3	B Dibenz(a,h)anthracene	BDL	10	BDL	10
191-24-2	B Benzo(g,h,i)perylene	BDL	10	BDL	10
319-84-6	P Alpha-BHC	BDL	0.05	BDL	0.05
319-85-7	P Beta-BHC	0.13	BDL	0.05	BDL
319-86-8	P Delta-BHC	BDL	0.05	BDL	0.05
58-89-9	P Gamma-BHC (Lindane)	BDL	0.05	BDL	0.05
76-44-8	P Heptachlor	BDL	0.05	BDL	0.05
309-00-2	P Aldrin	BDL	0.05	BDL	0.05
1024-57-3	P Heptachlor epoxide	BDL	0.05	BDL	0.05
959-98-8	P Endosulfan I	BDL	0.05	BDL	0.05
60-57-1	P Dieldrin	BDL	0.1	BDL	0.1
72-55-6	P 4,4'-DDE	BDL	0.1	BDL	0.1
72-20-8	P Endrin	BDL	0.1	BDL	0.1
33213-85-9	P Endosulfan II	BDL	0.1	BDL	0.1
72-54-8	P 4,4'-DDD	BDL	0.1	BDL	0.1
1031-07-8	P Endosulfan sulfate	BDL	0.1	BDL	0.1
60-29-3	P 4,4'-DDT	BDL	0.1	BDL	0.1
72-43-5	P Methoxychlor	BDL	0.5	BDL	0.5
53494-70-5	P Endrin ketone	BDL	0.1	BDL	0.1
7421-38-3	P Endrin aldehyde	BDL	0.1	BDL	0.1
5103-71-9	P Alpha-Chlordane	BDL	0.05	BDL	0.05
5103-74-2	P Gamma-Chlordane	BDL	0.05	BDL	0.05
8001-35-2	P Toxaphene	BDL	5	BDL	5
12674-11-2	P Aroclor-1016	BDL	1	BDL	1
11104-28-2	P Aroclor-1221	BDL	2	BDL	2
11141-16-5	P Aroclor-1232	BDL	1	BDL	1
53469-21-6	P Aroclor-1242	BDL	1	BDL	1

		SITE	INDIAN HEAD	INDIAN HEAD	INDIAN HEAD
		SAMPLE	42MW-3	42SW-1	42SW-2
		CCN: INORGANICS/ORGANICS			
		DATE			
		DEPTH			
		MATRIX	WATER	WATER	WATER
CAS. NO.	CL COMPOUND		ug/l	ug/l	ug/l
12672-29-6 P	Aroclor-1248		BDL	BDL	BDL
11097-69-1 P	Aroclor-1254		BDL	BDL	BDL
11096-82-5 P	Aroclor-1260		BDL	BDL	BDL

1989 GEOTECHNICAL DATA



Title
BORING LOCATION PLAN

FIGURE
2

Date 3-30-89

Scale; As shown

Job No

Drawn

Revision

83027

Approved

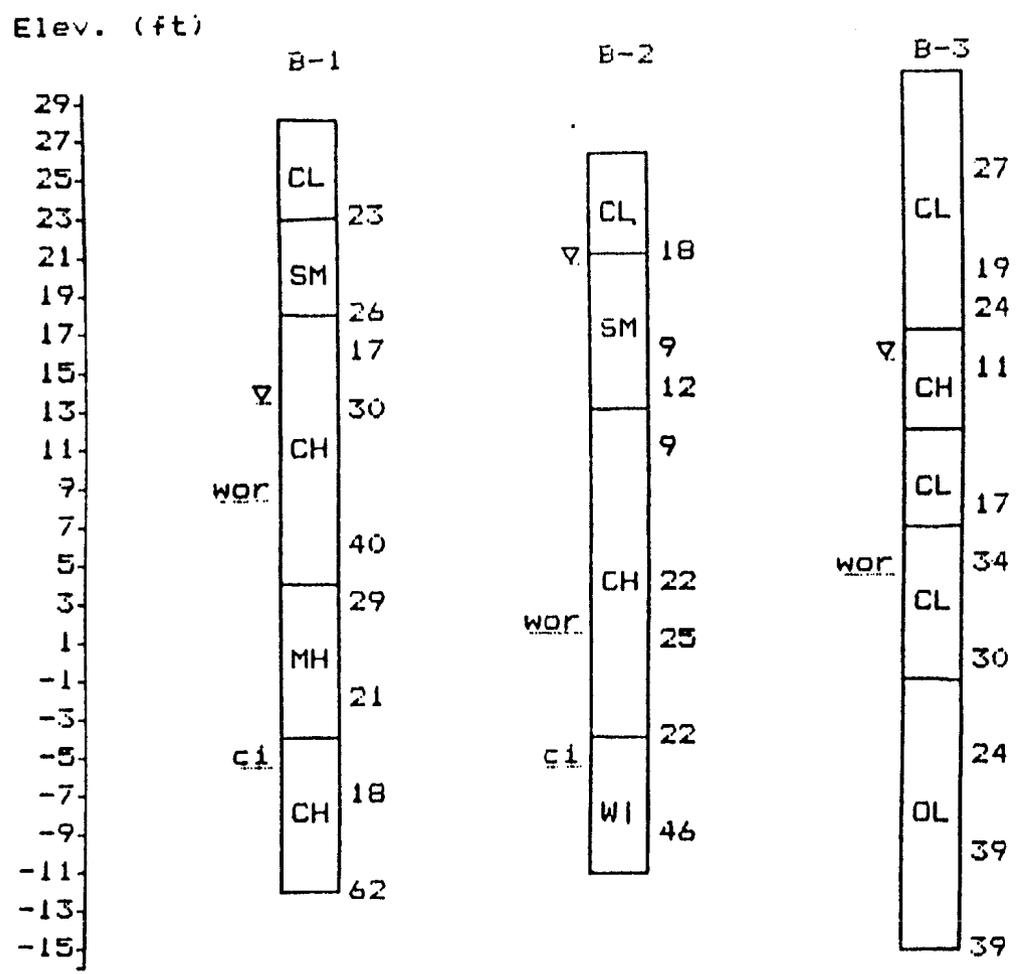
MIX BUILDING

ATEC Associates, Inc.
 Geotechnical and Materials Engineers

SUMMARY OF BORING DATA

Date	4-1-89	Scale	1/8" = 1'-0"
Drawn		Field Book	
Approved		Revisions	

Figure 3A
 JRM/MO
 83027



LEGEND:

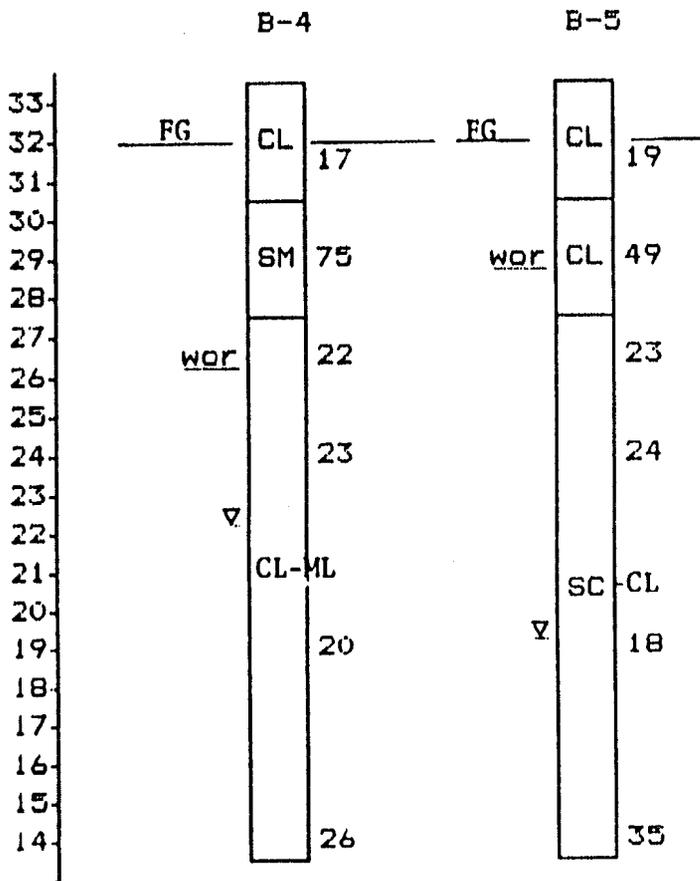
- WOR - Water on Drilling rods
- ▽ - Water level at completion
- x▽ - Water level after x-hours
- ci - Cave in at completion
- xci - Cave in after x-hours

○ — Boring Number
 xx — USCS Symbol
 xx — N-value

Note: Elevations and depths are rounded to the nearest 1.0 ft.

CONTROL BLDG

Elev. (ft)



LEGEND:

- WOR - Water on drilling rods
- ▽ - Water level at completion
- x▽ - Water level after x-hours
- ci - Cave in at completion
- xci - Cave in after x-hours

- — Boring Number
- xx — USCS Symbol
- — N-value

Note: Elevations and depths are rounded to the nearest 0.5 ft.

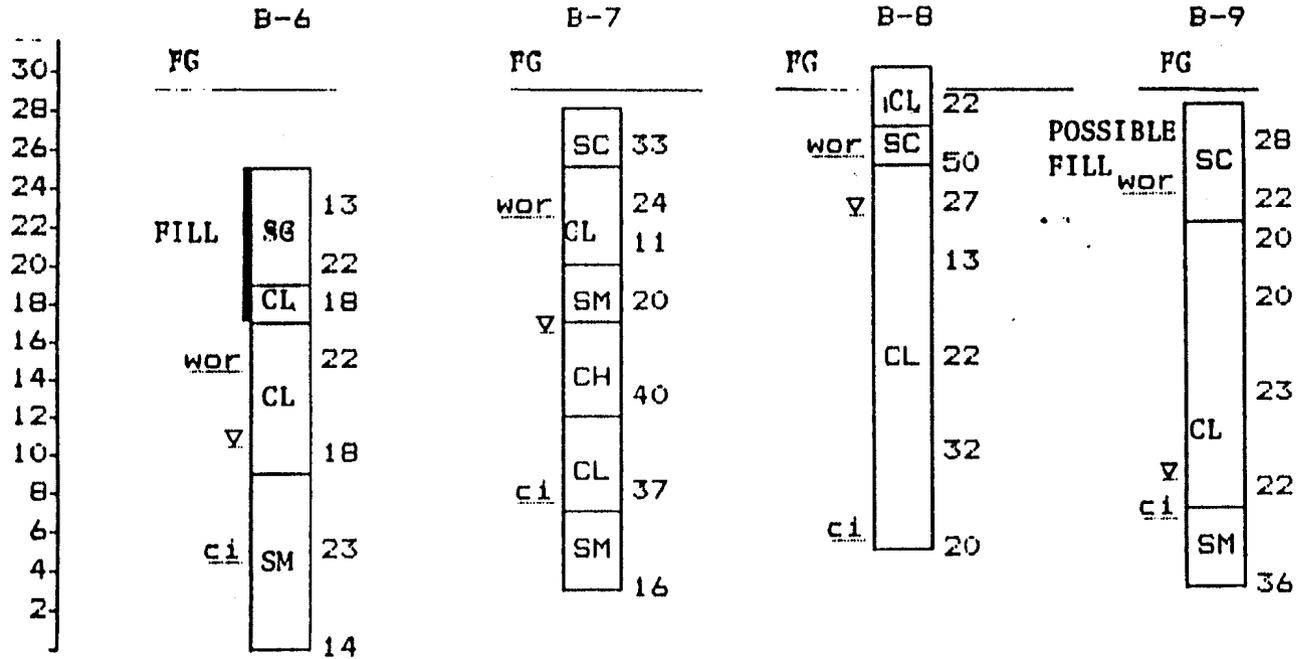
SUMMARY OF BORING DATA		Figure 3 B
Date 4-1-89	Scale	Job NO
Drawn	Field Book	27-
Approved	Revised	83027

ASSEMBLY BLDG NO 1

LEGEND:
 WOR - Water on drilling rods
 ▽ - Water level at completion
 x▽ - Water level after x-hours
 ci - Cave in at completion
 xci - Cave in after x-hours

○ — Spring Number
 [xx] — USCS Symbol
 xx — N-value

Elev. (ft)

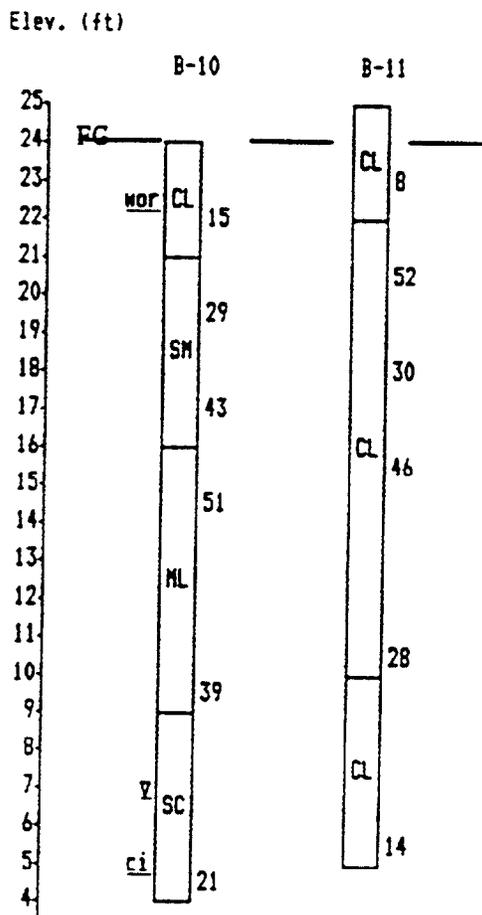


Note: Elevations and depths are rounded to the nearest 1.0 ft.

SUMMARY OF BORING DATA	
Date 4-1-89	Scale
Drawn	Field Book
Approved	Revised

Figure 3C
 19b NO
 83027

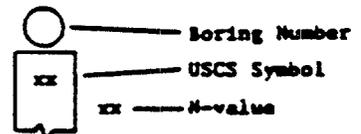
ASSEMBLY BLDG NO 2



Note: Elevations and depths are rounded to the nearest 0.5 ft.

LEGEND:

- WOR - Water on drilling rods
- ▽ - Water level at completion
- x▽ - Water level after x-hours
- ci - Cave in at completion
- xci - Cave in after x-hours.



ATEC Associates, Inc.



Geotechnical and Materials Engineers

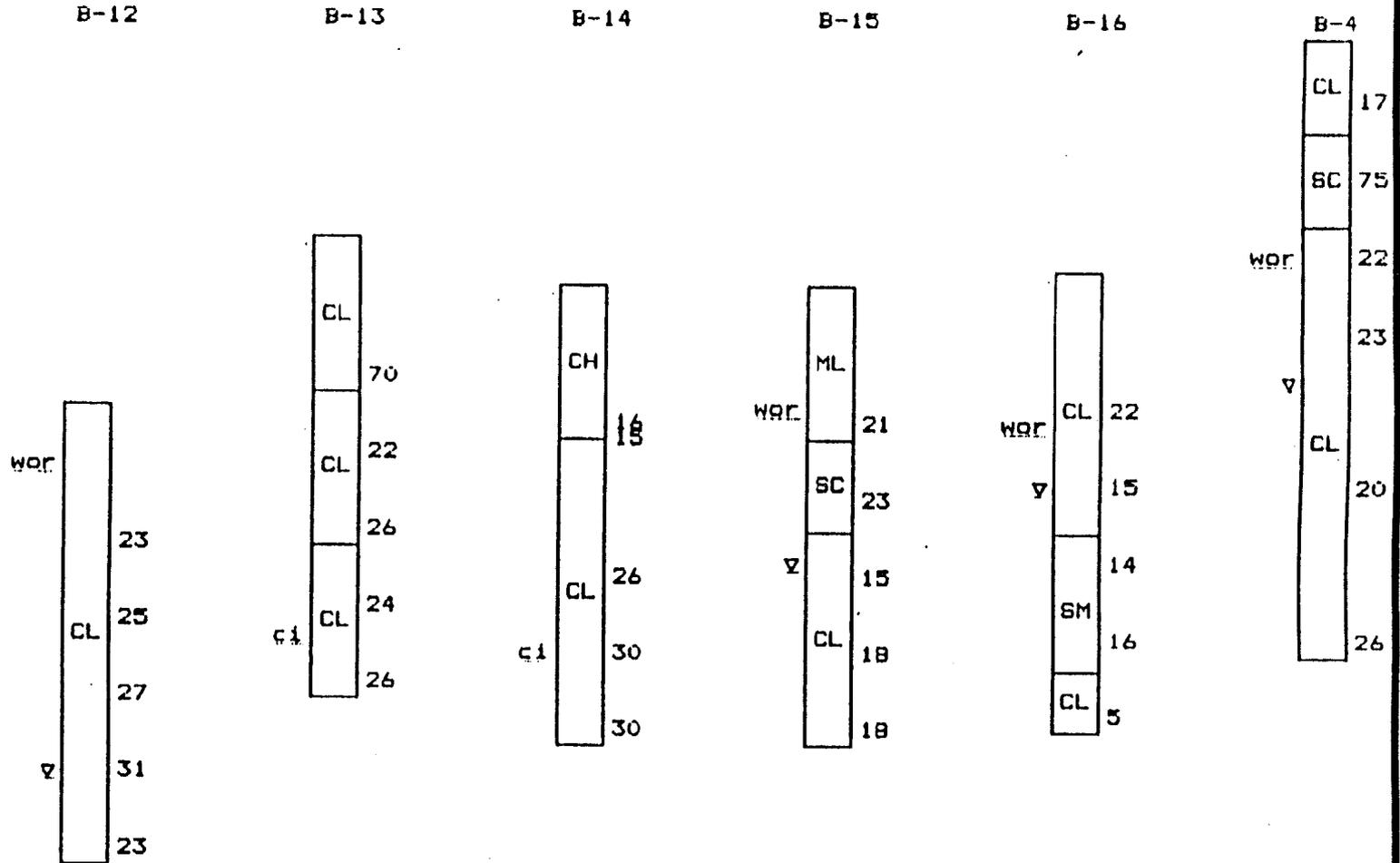
SUMMARY OF BORING DATA

Figure 3 D

Date 1-1-80	Scale	Job NO
Drawn	Field Book	83027
Approved	Revisions	

INFILTRATION

33
32
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7



Note: Elevations and depths are rounded to the nearest 0.5 ft

LEGEND:
 WOR - Water on drilling rods
 ▽ - Water level at completion
 x▽ - Water level after x-hours
 ci - Cave in at completion
 xci - Cave in after x-hours

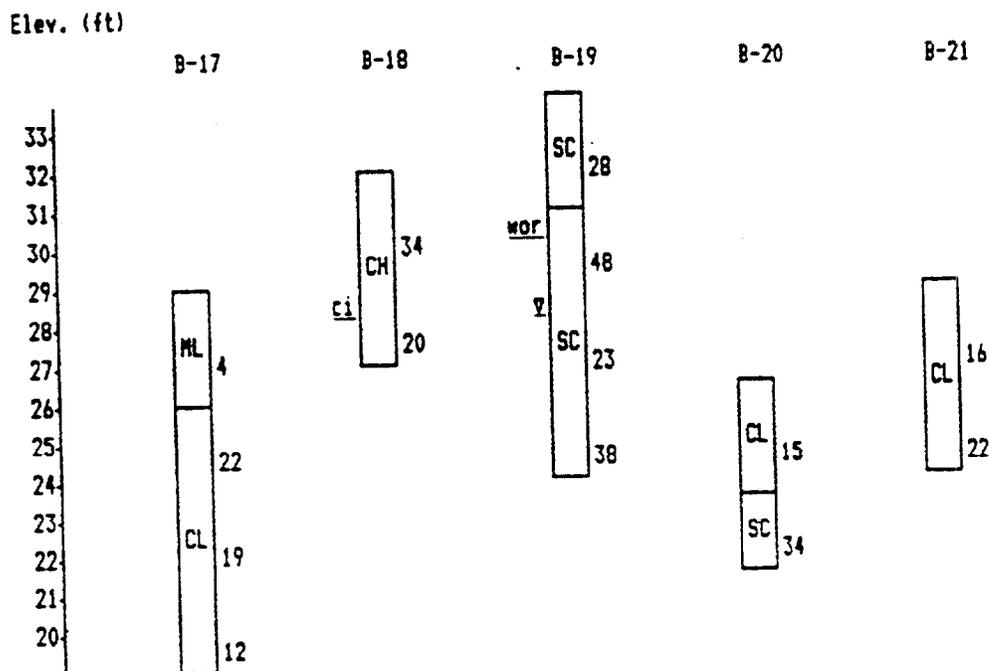
○ — Spring Number
 xx — USCS Symbol
 xx — N-value

SUMMARY OF BORING DATA

Figure 3E

Date 4-1-89	Scale	Job NO
Drawn	Field Book	83027
Approved	Revisions	

PAVEMENT



Note: Elevations and depths are rounded to the nearest 0.5 ft.

LEGEND:

- WOR - Water on drilling rods
- ▽ - Water level at completion
- x▽ - Water level after x-hours
- ci - Cave in at completion
- xci - Cave in after x-hours

- — Boring Number
- xx — USCS Symbol
- — N-value

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 Geotechnical and Materials Engineers

SUMMARY OF BORING DATA		Figure 3 F
Date 4-1-89	Scale	Job NO
Drawn	Field Book	83027
Approved	Revisions	

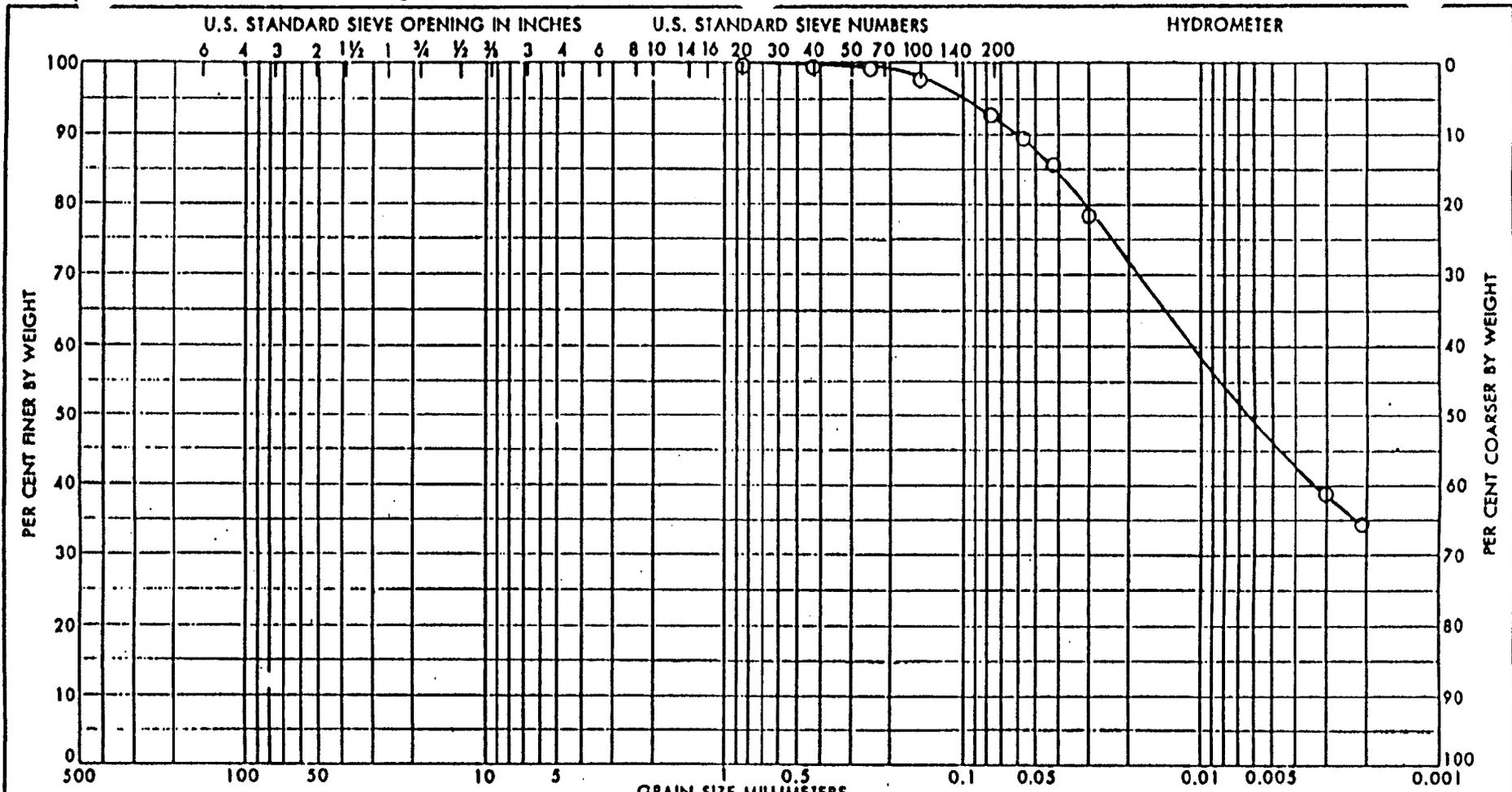
SUMMARY OF LABORATORY TEST RESULTS

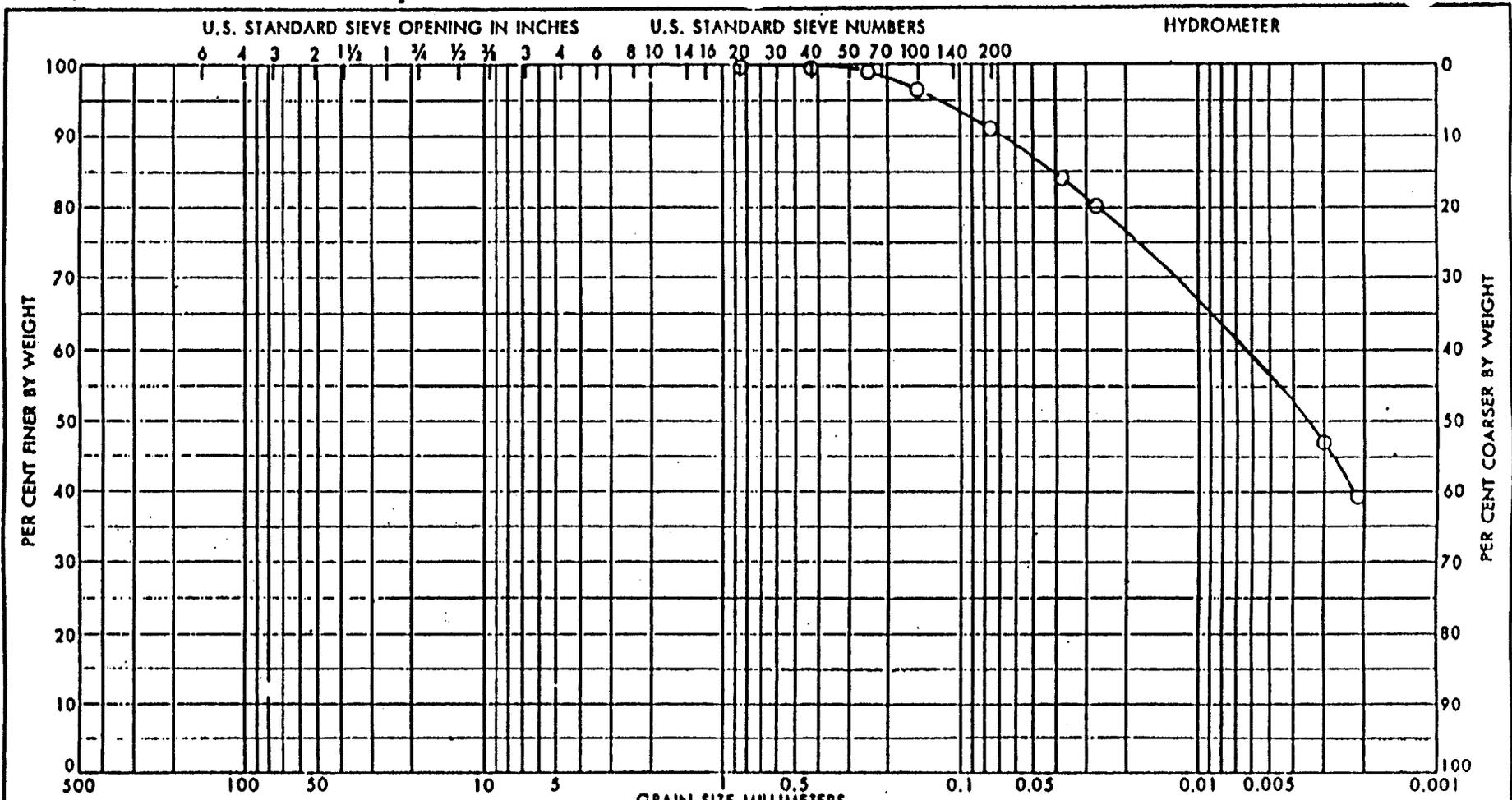
PROJECT NAME: Naval Ordnance Station

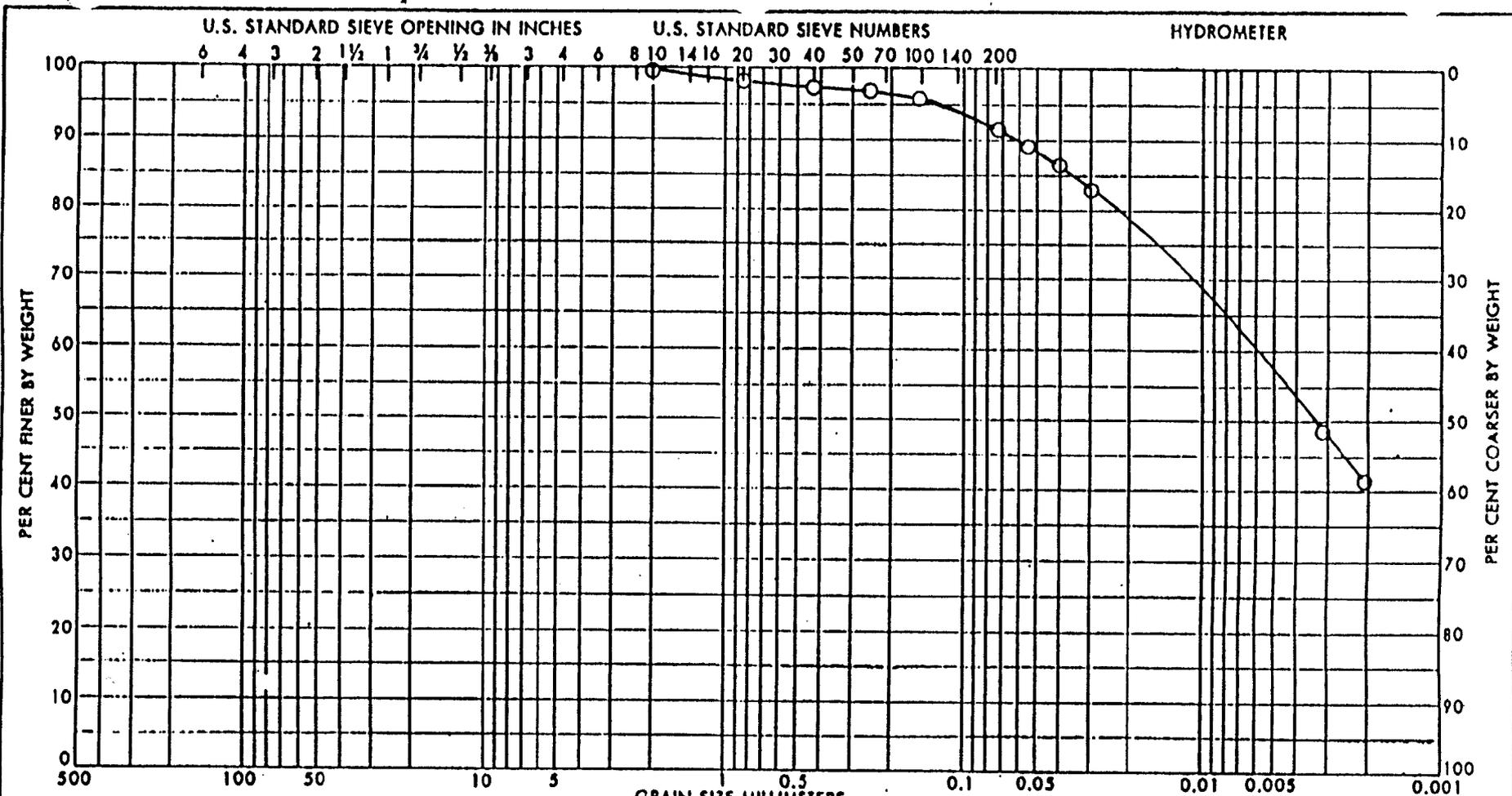
NUMBER: 27-83027

DATE: 4-24-89

Boring Number	Sample Number	Sample Interval Feet	Natural Moisture Content %	Atterberg Limits, %			CBR (Wet) %	% organ-ics	% finer than 0.075 mm	Maximum Dry Density pcf	Optimum Moisture %	USCS Class.
				L.L.	P.L.	P.I.						
1	7	28.5-30.0	42.2	51	31	20						
3	2	8.5-10.0	21.7					77.0				
3	10	38.5-40.0	223.5					67.5				
4	3	6.0- 7.5	22.6									
4	4	8.5-10.0	20.9	22	15	7			55.0			CL-ML
6	5	13.5-15.0	20.0	28	16	12						
6	6	18.5-20.0	21.0					43.2				
8	1	3.5- 5.0	22.1	36	14	22						
8	3	6.0- 7.5	26.1	44	18	26						
9	4	8.5-10.0	21.7	29	16.5	12.5						
11	3	6.0- 7.5	21.6									
11	4	8.5-10.0	12.4									
13	3	8.5-10.0						94.0				
13	5	13.5-15.0	18.6					91.8				
15	4	11.0-12.5						91.5				
16	2	6.0- 7.5						92.7				
19	1	0.0-10.0							118.5	12.5		



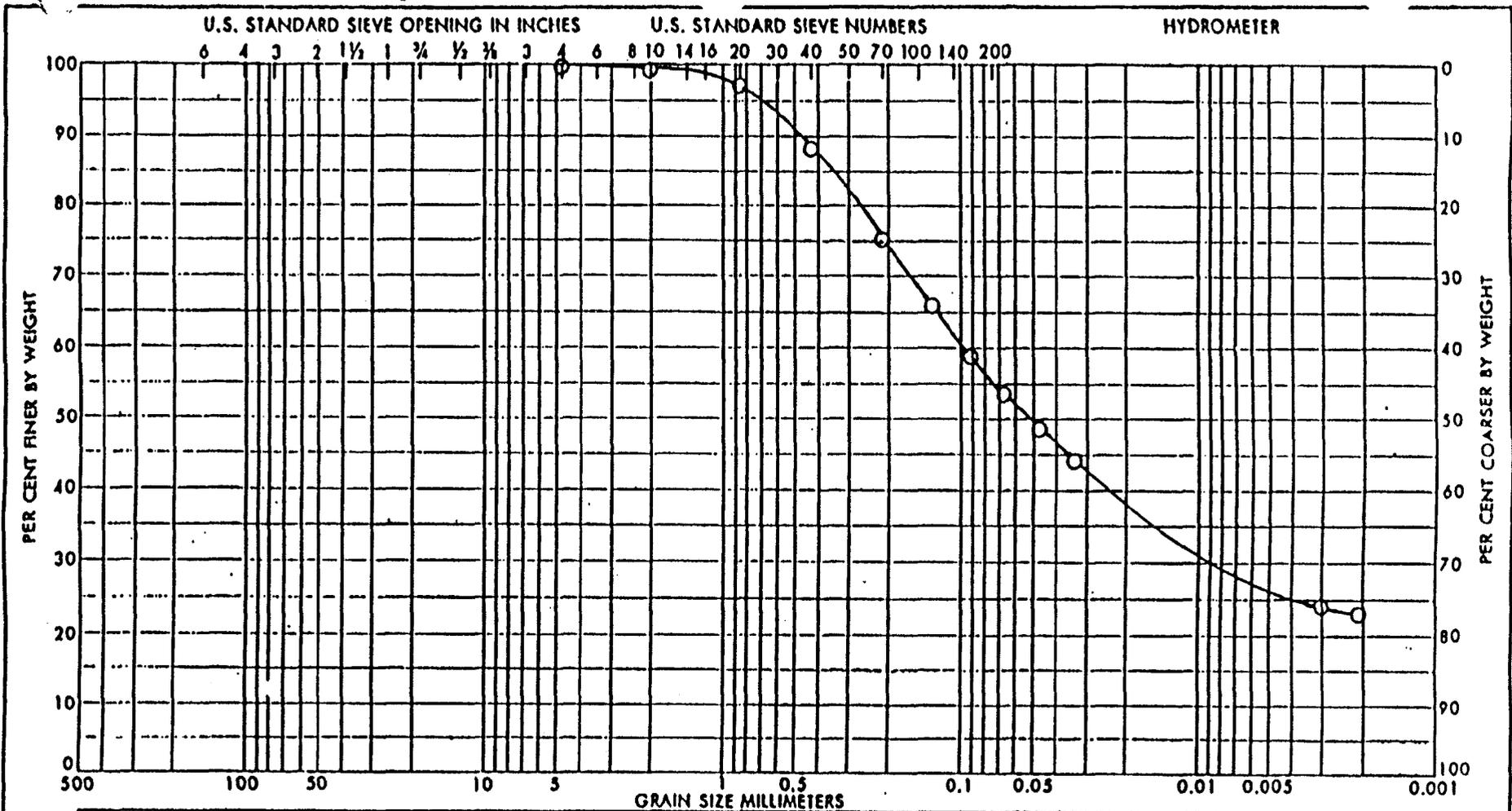




COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI	PROJECT
13-5	13.5-15.0	U.S.D.A. Silty Clay					Naval Ordnance Station
							27-83027
							AREA
							BORING NO. Boring 13, Sample 5
GRADATION CURVES							DATE





COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT WX	LL	PL	PI	PROJECT
4-4	8.5-10.0	U.S.D.A. Sandy Clay loam U.S.C.S. CL-ML		22	15	7	Naval Ordnance Station 27-83027
							AREA
							BORING NO. Boring 4, Sample 4
GRADATION CURVES							DATE

