

CENAB-EN-HN

**U.S. Army Corps of Engineers
Baltimore District**

**Phase I Interim Removal Action
Components 1, 2, and 3
TNT Pipeline and Chemical Waste Sewer
Former Lake Ontario Ordnance Works
Lewiston and Porter
Niagara County, New York**

Contract Specifications

Supplement to the 60% Design

Contract Number DACA31-96-D-0006
Delivery Order 0002

August 1998

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
Baltimore District
10 South Howard Street
Baltimore, Maryland 21201

98P-2163-1

Prepared by:



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1 Weston Way
West Chester, PA 19380-1499

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**PHASE I INTERIM REMOVAL ACTION
COMPONENTS 1, 2 AND 3
TNT PIPELINE AND CHEMICAL WASTE SEWER
FORMER LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER
NIAGARA COUNTY, NEW YORK

CONTRACT SPECIFICATIONS**

SUPPLEMENT TO THE 60% DESIGN

Prepared for

**U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT**
10 South Howard Street
Baltimore, Maryland 21202

August 1998

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DIVISION 1
SPECIAL CLAUSES

SECTION 01010

SUMMARY OF WORK

PART I GENERAL

1.1 SUMMARY

1.1.1 General

The Contractor shall furnish all labor, materials, equipment and services necessary to complete the work required in the specifications and as shown on the Drawings for Phase 1 Component 1 of the Interim Removal Action (IRA). This work includes remediation activities for the TNT pipeline located on the Chemical Waste Management Inc. (CWM) Property (Component 1), a portion of the Town of Lewiston Property (Component 3), and the Chemical Waste Sewer and Lift Stations also located on the CWM Property with a portion of the sewer line located on Somerset Property (Component 2). This phased Interim Removal Action will be performed at the former Lake Ontario Ordnance Works (LOOW) site in the towns of Lewiston and Porter, NY. The contractor shall perform the work in strict accordance with the specifications and the Drawings, and subject to the terms and conditions of the contract. The work required under this contract includes, but is not limited to, the items described herein.

1.1.2 TNT Pipeline

Remediation activities for the TNT pipelines will include field location and delineation of the pipelines based upon previous data; accessing and opening the pipelines at selected locations; removal, temporary staging and proper disposal of pipeline liquids, followed by excavation, removal and disposal of certain pipeline segments or flushing and closure in-place of other pipeline segments; removal and disposal of soils and sediments that exceed NYSDEC cleanup criteria and all wastes generated during remediation activities, and restoration of remediation areas and support area. All wastes shall be managed and disposed of by the Contractor as specified in Section 02120, TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NONHAZARDOUS MATERIALS, and Section 02141, DEWATERING LIQUIDS AND HANDLING.

- a. Excavation and complete removal shall be conducted for pipeline segments that have been damaged by site operations or previous investigative activities. The areas known to require excavation and complete removal are shown on the Drawings. Additional sections may require removal if found to be damaged during the remediation work. Remediation shall be conducted as specified in Section 02229, EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES.
- b. Intact sections of the TNT pipelines shall be remediated by flushing and closure in-place as specified in Section 0228, FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINES. Areas expected to be suitable for closure in-place are shown on the Drawings. The actual sections remediated by closure in-place will be determined during the remediation work through video camera surveys to confirm pipeline integrity and location of previously unidentified tie-ins. The Contracting Officer will make the final determination regarding remediation method.

- c. Sections of the south TNT pipeline downgradient of Sta 15+80 may be contaminated with PCBs. These sections shall be remediated as specified in Section 02230, REMEDIATION OF PCB-CONTAMINATED PIPELINE LIQUIDS AND SOILS.

1.1.3 Chemical Waste Sewers and Lift Stations

The Chemical Waste Sewers and Lift Stations will be remediated by removal of liquids and solids (sludges), cleaning by pressure washing, and sealing the Sewer Lines and Lift Stations. Remediation shall be conducted as specified in Section 02142, REMEDIATION OF CHEMICAL WASTE SEWERS AND LIFT STATIONS. Locations of the components to be remediated are as shown on the Drawings. All wastes generated during remediation activities, including but not limited to liquids, wastewater, sediment/sludge, debris and construction materials and PPE, shall be properly managed and disposed of by the Contractor as specified in Section 02120, TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NONHAZARDOUS MATERIALS, and Section 02141, DEWATERING LIQUIDS AND HANDLING.

1.1.4 Confirmation

Cleanup criteria for remediation are provided in Section 02010, CONFIRMATION, VERIFICATION, AND POST-INTERIM REMOVAL ACTION SAMPLING. The Contractor shall perform confirmation verification and post IRA sampling and analysis as specified therein prior to site closure.

1.1.5 Additional Work

It is possible that during the performance of the remediation work specified that the Contractor may uncover or otherwise discover areas for which the anticipated remediation approach should be altered or additional contaminated areas that need remediation. When such areas are discovered, they shall be inspected concurrently by the Contractor and the Contracting Officer (CO). The CO will promptly make a determination of the action to be taken.

1.2 PROJECT/SITE CONDITIONS

Other contracts may be in effect at the site, and Federal, State, and local authorities have regulatory responsibilities which may bring them on-site. Portions of the work are in occupied or active industrial areas. The Contractor shall perform this work so as to fully cooperate with other contractors, site owners/operators, and Federal, State, or other governing authorities. No direct or extra compensation will be allowed on account of the coordination or cooperation required.

1.3 SEQUENCING AND SCHEDULING

Should the Contractor fail to maintain a satisfactory rate of progress, the CO may require that additional personnel and equipment be placed on the work and weekend and overtime work be performed, in order that the work be brought up to schedule and maintained.

1.4 CONTRACTOR USE OF PREMISES

1.4.1 Haul Routes

The Contractor shall use the haul routes designated by the Contracting Officer.

1.4.2 On-Site Storage Areas

The Contractor shall indicate the location of on-site area(s) for storage of equipment and materials during the life of the project in the Site Operations Plan. The Contracting Officer will approve the Contractor's proposed storage areas.

1.5 CONTRACTOR'S RECEIPT OF SUPPLIES

The Contractor shall be responsible for all arrangements for the receipt of materials and supplies at the job site. Government personnel are not permitted to receive or sign for items delivered.

1.6 REGULATORY REQUIREMENTS

1.6.1 Compliance with Federal, State, and Local Regulations

The Contractor shall conduct the work in accordance with all applicable laws and regulations, and shall be responsible for coordinating with Federal, State, and local authorities. The Contractor shall be responsible to obtain all permits and comply with all order of conditions for the work.

- a. PL 96-510, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- b. PL 99-499, Superfund Amendments and Reauthorization Act (SARA).
- c. PL 98-212, DOD Appropriation Act, Environmental Restoration.
- d. PL 99-190, DOD Appropriation Act, Environmental Restoration.
- e. 29 CFR 1910, Occupational Safety and Health Administration (OSHA) General Industry Standards.
- f. 29 CFR 1910.120, OSHA, Hazardous Waste Site Operations and Emergency Response.
- g. 29 CFR 1910.1001, Occupational Safety and Health Standards, Asbestos, Including Appendices A through I.
- h. 29 CFR 1910.134, OSHA, General Industry Respirator Requirements.
- i. 29 CFR 1926, OSHA, Construction Industry Standards.
- j. 29 CFR 1926.1101, Safety and Health Regulations for Construction.
- k. AR 200-1, Environmental Quality, Environmental Protection and Enhancement.
- l. AR 385 series.
- m. ER 385 series.
- n. EM 385-1-1, USACE, Safety and Health Requirements Manual.
- o. 40 CFR Part 262, RCRA - Standards Applicable to Generators of Hazardous Waste.

- p. RCRA - Hazardous Waste Management (40 CFR Part 264), Subpart C - Preparedness and Prevention (40 CFR 264.30 - 264.37), Subpart D - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56).
- q. 40 CFR Part 50, CAA - National Ambient Air Quality Standards (NAAQA) for Particulate Matter.
- r. PL 94-469, Toxic Substances Control Act, Including Amendments (PL 97-129).
- s. 40 CFR Part 761 - TSCA PCBs.
- t. 6 NYCRR Part 360, Solid Waste Management Facilities.
- u. 6 NYCRR Part 370, 371, 372, 373, Hazardous Waste Management.
- v. 6 NYCRR Part 376, Land Disposal Restrictions.
- w. 6 NYCRR Part 700-705—Water Quality Regulations.
- x. NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-92-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels."
- y. NYSDEC, Division of Hazardous Substances Regulations, TAGM HSR-92-3028, "Contained-In Criteria for Environmental Media."
- z. NYS TOGS 1.1.1—Ambient Water Quality Standards and Guidance Values.

1.7 PRECONSTRUCTION CONFERENCE

The CO will conduct a Preconstruction Plan Review Conference to reinforce contract conditions with the Contractor, and discuss the comments received on the Site Operations Plan and Site Health and Safety Plan. The purpose of this conference is to review the requirements for submittals, safety, payrolls, labor relations, environmental protection, notifications of construction activities, progress schedules, and payment and procurement of materials. The principal features of work will also be reviewed, avenues of ingress and egress will be identified, and any questions regarding the contract and work site will be addressed. At this Preconstruction Plan Review Conference, the Contractor shall inform the CO of the overall planning and methods the Contractor intends to accomplish the work that has been described in the Site Operations Plan. It is mandatory that this Preconstruction Plan Review Conference be attended by the Contractor or his representative and his on-site construction manager prior to beginning any work on the contract.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Use of Brand Names

If items called for by this specification have been identified by a "brand name" description, such identification is intended to be descriptive, but not restrictive, and is to indicate the quality and characteristics of products that will be satisfactory, unless otherwise specifically provided in this contract.

PART 3 EXECUTION (Not Applicable)

- End of Section -

**LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY**

SECTION 01030

JOB CONDITIONS

INSTRUCTION: ~~LAYOUT OF WORK: THE APPROPRIATE PARAGRAPH SHALL BE SELECTED. DO NOT INCLUDE REFERENCES TO BASE LINES AND/OR BENCH MARKS WHEN SUCH REFERENCES ARE NOT APPLICABLE. (LAYOUT OF WORK REQUIREMENTS FOR AIRFIELD PAVEMENTS TO BE FURNISHED BY DISTRICT OFFICE.)~~

ALTERNATE 1: ~~SURVEY MUST BE SHOWN ON SITE PLAN.~~

PART 1 LAYOUT OF WORK: (NOV 1993)

The Contractor shall layout its work from Government established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due the Contractor. (CENAB).

ALTERNATE 2: OMITTED

1. ~~LAYOUT OF WORK: (APR 1984) The Contractor shall lay out his work and shall be held responsible for all measurement's in connection therewith. The Contractor shall furnish, at his own expense, all stakes, templates, platforms, equipment, tools, and materials and labor as may be required in laying out any part of the work. The Contractor will be held responsible for the execution of the work to such lines and grades as may be established or indicated by the Contracting Officer. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed, by the Contractor or through his negligence, prior to their authorized removal, they may be replaced by the Contracting Officer at his discretion. The expense of replacement will be deducted from any amounts due or to become due the Contractor. (CENAB)~~

ALTERNATE 3: OMITTED FOR REHABILITATION OF STRUCTURES.

1. ~~LAYOUT OF WORK: (APR 1972) The Contractor shall lay out his work and shall be responsible for all measurements in connection therewith. The Contractor shall furnish, at his own expense, all templates, platforms, equipment, tools and materials and labor as may be required in laying out any part of the work. The Contractor will be held responsible for the execution of the work to such lines and elevations shown on the drawings or indicated by the Contracting Officer. (CENAB)~~

~~INSTRUCTION: PHYSICAL DATA: ALL INFORMATION CONCERNING CONDITIONS PERTAINING TO THE PERFORMANCE OF THE CONTRACT WORK, WHICH HAS BEEN MADE AVAILABLE TO THE CONTRACTOR SHOULD BE REFERENCED INTO THE CONTRACT BY COMPLETING THE CLAUSE SET FORTH BELOW. WHENEVER TEST BORINGS ANALYSES, OR HYDROGRAPHIC DATA ARE TO BE MADE AVAILABLE TO THE CONTRACTOR, THE WORDING OF THIS SPECIAL CLAUSE SHOULD BE SUCH AS ONLY TO INFORM THE CONTRACTOR AS TO THE SOURCE OF THE DATA AND WHERE IT MAY BE EXAMINED.~~

PART 2 PHYSICAL DATA

(APR 1984) Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation or conclusion drawn from the data or information by the Contractor. (CENAB)

2.1 TRANSPORTATION FACILITIES

(NOTE: Insert transportation facilities information for this project from the package attached to the end of this section.)

2.2 EXPLORATIONS

The physical conditions indicated on the drawings and in the specifications are the result of site investigations by {surveys}, {auger borings} {core borings} and {test pits} {probing} {and} {test tunnels} Foundation exploration logs are {shown on drawings} {inserted at the end of this Section.}. Whenever sSubsurface exploration logs are presented in the contract documents, and analytical soil test results are available for inspection in the Baltimore District, Corps of Engineers, Geotechnical Engineering Branch, Room 9250, City Crescent Building, 10 South Howard Street, Baltimore, Maryland. A reference list of documents for this site is provided in Section 01110: SAFETY, HEALTH, AND EMERGENCY RESPONSE. Soils and rock samples are also available for inspection; however, prospective bidders are required to call (410) 962-2002 between the hours of 9:00 a.m. and 3:30 p.m., Monday through Friday (excluding Federal Holidays), a minimum of 24 hours in advance to arrange a time and date for the inspection of the samples.

~~INSTRUCTION: PREVIOUS EXPLORATION. WHEN ADDITIONAL EXPLORATION INFORMATION IS AVAILABLE THIS CLAUSE WILL BE USED, AND LOCATION OF SUCH INFORMATION WILL BE INCLUDED.~~

2.3 PREVIOUS EXPLORATION

In addition to the exploration information shown on the drawings, other borings were made and test pits were excavated for the Pre-closure, Closure and Supplemental Closure the Site Assessment, Remedial and Preliminary Remedial Design Investigations (Insert Pertinent Information). A list of available documents is provided in Section 01110: SAFETY, HEALTH AND EMERGENCY RESPONSE, Subsection 1.8.1.2. The location of these and the field laboratory data for all exploration are available for inspection in the Office of the District Engineer, U.S. Army Engineer District, Baltimore, Corps of Engineers, City Crescent Building, 10 South Howard Street, Baltimore, Maryland 21201.

~~INSTRUCTION: AVAILABILITY AND USE OF UTILITY SERVICES INCLUDING LAVATORY FACILITIES: INSERT THE FOLLOWING CLAUSE.~~

PART 3 UTILITIES

3.1 AVAILABILITY OF UTILITIES INCLUDING LAVATORY FACILITIES: (JUN 1980)

It shall be the responsibility of the Contractor ~~to locate and confirm utility line locations and~~ to provide all utilities he may require during the entire life of the contract. He shall make his own investigation and determinations as to the availability and adequacy of utilities for his use for construction purposes and domestic consumption. He shall install and maintain all necessary supply lines, connections, piping, and meters if required, but only at such locations and in such manner as approved by the Contracting Officer and Property Owner (where applicable). Before final acceptance of work under this contract, all temporary supply lines, connections and piping installed by the Contractor shall be removed by him in a manner satisfactory to the Contracting Officer. (CENAB)

~~INSTRUCTION: ——— INTERRUPTION OF UTILITIES: THIS CLAUSE WILL BE USED ON ALL CONSTRUCTION PROJECTS WHICH MAY REQUIRE ANY EXISTING UTILITIES TO BE INTERRUPTED TO PERMIT MAKING CHANGES, CONNECTIONS, OR RELOCATIONS. THE PARAGRAPH MUST BE EDITED TO REFLECT ACTUAL PROJECT REQUIREMENTS.~~

3.2 INTERRUPTION OF UTILITIES: (1972)

3.2.1 No utility services shall be interrupted by the Contractor ~~to locate and confirm utility line locations and~~ to make connections, to relocate, or for any purpose without approval of the Contracting Officer.

3.2.2 Request for permission to shut down services shall be submitted in writing to the Contracting Officer not less than 17 days prior to date of proposed interruption. The request shall give the following information:

3.2.2.1 Nature of Utility (~~Gas~~, L.P. or H.P., Water, Etc.).

3.2.2.2 Size of line and location of shutoff.

3.2.2.3 Buildings and services affected.

3.2.2.4 Hours and date of shutoff.

3.2.2.5 Estimated length of time service will be interrupted.

3.2.3 Services will not be shut off until receipt of approval of the proposed hours and date from the Contracting Officer ~~and Property Owners~~.

3.2.4 Shutoffs which will cause interruption of ~~Government Property Owner~~ work operations as determined by the Contracting Officer shall be accomplished during regular non-work hours or on non-work days of the Using Agency without any additional cost to the Government.

3.2.5 Operation of valves on water mains will be by ~~Government Property Owner~~ personnel. Where shutoff of water lines interrupts service to fire hydrants or fire sprinkler systems, the Contractor shall arrange his operations and have sufficient material and personnel available to complete the work without undue delay or to restore service without delay in event of emergency.

~~3.2.6 Flow in gas mains which have been shut off shall not be restored until the Government inspector has determined that all items serviced by the gas line have been shut off. (CENAB)~~

~~INSTRUCTION: ALTERATIONS TO UTILITIES: THIS CLAUSE WILL BE USED WHEN CONTRACT WORK MAY INTERFERE WITH EXISTING ELECTRIC POWER OR TELEPHONE LINES TO THE EXTENT THAT TEMPORARY OR PERMANENT RELOCATION OF THESE FACILITIES MUST BE PERFORMED BY OTHERS AS STATED.~~

3.3 ALTERATIONS TO UTILITIES: (AUG 1968)

Where changes and relocations of utility lines are noted to be performed by others, the Contractor shall give the Contracting Officer at least thirty days' written notice in advance of the time that the change or relocation is required. In the event that, after the expiration of thirty days after the receipt of such notice by the Contracting Officer, such utility lines have not been changed or relocated and delay is occasioned to the completion of the work under this contract, the Contractor will be entitled to a time extension equal to the period of time lost by the Contractor after the expiration of said thirty day period. Any modification to existing or relocated lines required as a result of the Contractor's method of operation shall be made wholly at the Contractor's expense and no additional time will be allowed for delays incurred by such modifications. (CENAB)

~~INSTRUCTION: DISPOSAL OF EXISTING MATERIAL AND EQUIPMENT: INSERT THE FOLLOWING CLAUSE IN ALL PROJECTS WHERE DISPOSAL OF EXISTING MATERIAL OR EQUIPMENT IS NECESSARY.~~

SECTION 4.

PART 4 DISPOSAL OF EXISTING MATERIAL AND EQUIPMENT: (DEC 1975)

All removed, dismantled or demolished material and/or equipment including rubble, scrap and debris not specified or indicated to be Government salvaged, reinstalled under this contract or otherwise retained for disposal on Government land will become the property of the Contractor and shall be promptly removed from the site and disposed of by the Contractor at his own expense and responsibility. (CENAB)

~~INSTRUCTION: COMPLIANCE WITH POST/BASE REGULATIONS: INSERT THE FOLLOWING CLAUSE IN ALL PROJECTS LOCATED ON A MILITARY RESERVATION.~~

SECTION 5.

PART 5 COMPLIANCE WITH PROPERTY OWNER SITE RULES AND SAFETY PROCEDURES POST/BASE REGULATIONS: (JUL 1980)

The site of the work is on ~~private property~~ ~~a military reservation~~ and all rules and safety ~~procedures~~ ~~regulations~~ issued by the ~~Property Owner~~ ~~Commanding Officer~~ covering general safety, security, sanitary requirements, pollution control, traffic regulations and parking, shall be observed by the Contractor. Information regarding these requirements may be obtained by contacting the ~~Property Owner~~ or Contracting Officer, who will provide such information or assist in obtaining same from the ~~Property Owners~~ ~~appropriate authorities~~. (MEMO)

CWM Property Contact:	Somerset Property Contact:
CWM Management Services, Inc.	Somerset Group, Inc.
Attn: Ms. Becky Park-Zayat	Attn: Mr. John Syms
PO Box 200	Lew-Port Industrial Park
1550 Balmer Road	Balmer Road
Model City, NY 14107	Youngstown, NY 14174
Telephone: (716) 754-8231	Telephone: (716) 754-4303

INSTRUCTION: ~~MAINTENANCE OF ACCESS; PROTECTION OF GOVERNMENT PROPERTY AND PERSONNEL: INSERT THE FOLLOWING CLAUSES IN PROJECTS INVOLVING THE REHABILITATION OF STRUCTURES. EDIT AS NECESSARY TO REFLECT SPECIFIC JOB REQUIREMENTS.~~

SECTION 6.

PART 6 MAINTENANCE OF ACCESS: (DEC 1975)

The Contractor shall not block passage through sidewalks, roads, alleys or other entranceways to the building, roadways, disposal sites, and monitoring points during performance of work under this contract. In addition, the Contractor shall at all times maintain safe and clear passage through interior corridors and doorways to allow minimal disruption of normal activities within the building. No equipment or new materials are to be stored in the building except those items that are necessary for progress of the immediate work. All existing equipment, materials and debris removed during the work that are not to be reinstalled shall be removed daily by the Contractor from the building, roadways, disposal sites, and monitoring points. (CENAB)

SECTION 7.

PART 7 PROTECTION OF GOVERNMENT AND PRIVATE PROPERTY AND PERSONNEL: (DEC 1975)

7.1 EQUIPMENT

All existing Government or Property Owner owned equipment within the work area shall be protected by the Contractor from damage caused by construction operations. As a minimum, the Contractor shall cover all furniture, equipment and carpets in the work area with dust barriers and protect such items from any damage due to dust, vibration, water, heat or other conditions resulting from construction activities. Existing work damaged by construction operations shall be promptly repaired by the Contractor at his own expense.

7.2 PERSONNEL

The Contractor shall protect Property Owners, their employees, and site visitors occupants of the building by installing safety rails and/or barricades as applicable to prevent injury from unauthorized entry of personnel into work areas. Warning signs shall be erected as necessary to indicate Construction areas or hazardous zones. Work shall proceed in such manner as to prevent the undue spread of dust and flying particles. The Contractor shall also prepare a notification plan for Property Owner personnel in the event of an emergency or spill.

7.3 ADDITIONAL MEASURES

The Contractor shall take such additional measures as may be directed by the Contracting Officer to prevent damage or injury to Government and private property or personnel. (CENAB)

INSTRUCTION: ~~STREET CLOSINGS: INSERT THIS PARAGRAPH IN PROJECTS THAT WILL REQUIRE EXCAVATION IN EXISTING STREETS.~~

SECTION 8.

PART 8 STREET CLOSINGS: (MAY 1978)

When operations in connection with contract work necessitate the closing of streets, it shall be the Contractor's responsibility to arrange in advance with the Contracting Officer and Property Owner for

such street closings and to provide appropriate barricades, signs, markers, flares, and other devices as may be required by the Contracting Officer's Representative and Property Owner for traffic guides and public safety. (CENAB)

INSTRUCTION: ~~ORDER OF WORK AND COORDINATION WITH OTHER CONTRACTORS:~~
~~USE THIS CLAUSE WHEN APPLICABLE.~~

SECTION 9.

PART 9 ORDER OF WORK AND COORDINATION WITH OTHER CONTRACTORS: (FEB 1979)

Other Contractors may be are presently working in the same area. After award of this contract a meeting will be held with all contractor representatives and the Contracting Officer to develop a plan of work coordination. In case of disagreement regarding use of an area the decision of the Contracting Officer will control. (CENAB)

INSTRUCTION: ~~SALVAGE MATERIAL AND EQUIPMENT: INSERT THE FOLLOWING~~
~~CLAUSE IN CONTRACTS WHICH INVOLVE ITEMS OF PROPERTY WHICH~~
~~ARE TO BE REMOVED AND TURNED OVER TO THE GOVERNMENT.~~

SECTION 10.

PART 10 ~~OMITTED SALVAGE MATERIAL AND EQUIPMENT: (OCT 1993)~~

~~The Contractor shall maintain adequate property control records for all materials and equipment specified to be salvaged. These records may be in accordance with the Contractor's system of property control, if approved by the property administrator. The Contractor shall be responsible for the adequate storage and protection of all salvaged materials and equipment and shall replace, at no cost to the Government, all salvage materials and equipment which are broken or damaged during salvage operations as the result of his negligence, or while in his care. (CENAB EN DT)~~

~~The above listed salvage material shall become the property of the Government. The Contractor shall deliver such salvage material to [a location on Post as directed by the Contracting Officer.] [.....] (CENAB)~~

INSTRUCTION: ~~CONTRACTOR USE OF HEATING PLANT: USE THIS PROVISION WHEN~~
~~APPLICABLE.~~

SECTION 11.

PART 11 ~~OMITTED~~

CONTRACTOR USE OF HEATING PLANT: (1968) (MOD 1975)

11.1

~~The Contractor may, at his option, utilize the heating system installed under this contract to provide space heating prior to the time of completion of the building. All fuel oil for such space heating and for the required tests of heating equipment shall be furnished by the Contractor and shall be of the type and grade specified.~~

11.2

~~The heating system shall be operated only by qualified personnel and shall be operated with all auxiliaries and in accordance with the manufacturer's instructions and good operating practice. Boilers~~

shall not be operated for space heating until the Contracting Officer is furnished a written statement signed by the Contractor certifying that all water treating equipment, combustion control equipment, and the boiler safety controls have been properly installed and are operating satisfactorily. When a boiler is to be shut down for a period of more than 5 days, the combustion chamber and the fire sides of all boiler tubes shall be cleaned thoroughly immediately after shutdown. If at any time the Contracting Officer determines that the equipment is being improperly operated or maintained, the Contractor may be directed to discontinue its use.

11.3

Heating systems shall be operated and controlled to prevent temperature in any room or space in the building from exceeding 90 degrees F.

11.4

The Contractor shall, prior to the time of final acceptance of all work under this contract, place the heating system and related equipment in a condition equal to new. The combustion chamber and fire side of all boiler tubes shall be cleaned, burner nozzles shall be cleaned and adjusted, and air filters, and pipeline strainers shall be replaced or cleaned, as required. (CENAB)

INSTRUCTION: ~~MAINTENANCE OF UTILITIES: USE THIS CLAUSE WHEN ALTERATIONS ARE REQUIRED TO AN EXISTING FACILITY THAT WILL BE IN USE BY GOVERNMENT PERSONNEL DURING CONSTRUCTION.~~

SECTION 12

PART 12 MAINTENANCE OF UTILITIES: (FEB 1985)

Throughout construction, the Contractor shall provide and/or maintain toilet facilities for Government personnel. The Contractor shall provide alternate space heating for Government personnel when necessary during shutdown of the heating system. (CENAB)

INSTRUCTION: ~~Asbestos HANDLING AND REMOVAL: ANY MATERIAL SUSPECTED OF AS CONTAINING Asbestos THAT WILL BE DISTURBED ON THIS PROJECT MUST BE ANALYZED UNDER A LIGHT MICROSCOPE. NOTE: THIS IS THE ONLY PRESENTLY KNOWN POSITIVE IDENTIFICATION PROCESS. ONE OF THE FOLLOWING ALTERNATES MUST BE USED IN ALL PROJECTS.~~

ALTERNATE 1: ~~THE FOLLOWING CLAUSE SHALL BE INSERTED IN ALL PROJECTS WHERE Asbestos HAS NOT BEEN IDENTIFIED.~~

SECTION 13.

Asbestos HANDLING AND REMOVAL: (FEB 85)

Through site investigations, friable asbestos has not been found, however if asbestos is encountered, its testing, removal and disposal is covered in "CHANGES" clause of the Contract Clauses. (CENAB)

ALTERNATE 2: ~~THE FOLLOWING CLAUSE SHALL BE INSERTED IN ALL PROJECTS FOUND TO CONTAIN Asbestos. DESIGNER SHALL EDIT PARAGRAPH 13.3 TO GIVE APPLICABLE Asbestos SPECIFICATION FOUND IN DIVISION 2 OF THE TECHNICAL PROVISIONS. AN Asbestos SURVEY REPORT MUST BE INSERTED AT THE END OF THIS SECTION TO ACCOMPANY THIS CLAUSE.~~

PART 13

ASBESTOS (JAN 1985 REV NOV 1993)

13.1 — WARNING

~~THE CONTRACTOR IS WARNED THAT EXPOSURE TO AIRBORNE ASBESTOS HAS BEEN ASSOCIATED WITH FOUR DISEASES: LUNG CANCER, CERTAIN GASTROINTESTINAL CANCERS, PLEURAL OR PERITONEAL MESOTHELIOMA AND ASBESTOSIS. Studies indicate there are significantly increased health dangers to persons exposed to asbestos who smoke and further, to family members and other persons who become indirectly exposed as a result of the exposed worker bringing asbestos-laden work clothing home to be laundered.~~

13.2 — FRIABLE/NONFRIABLE ASBESTOS

~~The Contractor is advised that friable and/or nonfriable asbestos-containing material has been identified in area(s) where contract work is to be performed. Friable asbestos-containing material means any material that contains more than 1 percent asbestos by weight that hand pressure can crumble, pulverize or reduce to powder when dry. Nonfriable asbestos-containing materials do not release airborne asbestos fiber during routine handling and end use. However, excessive fiber concentrations may be produced during uncontrolled abrading, sanding, drilling, cutting, machining, removal, demolition or other similar activities. Whether asbestos is friable or nonfriable, care must be taken to avoid releasing or causing to be released, asbestos fibers into the atmosphere where they may be inhaled or ingested.~~

13.3 — PROTECTION

~~When contract work activities are carried out in locations where the potential exists for exposure to airborne asbestos fibers as described in paragraph 13.2 or where asbestos waste will be generated, the contractor shall assure that all measures necessary to provide effective protection to persons from exposure to asbestos fibers and prevention of contamination to property, materials, supplies, equipment and the internal and external environment are effectively instituted. The Contractor shall conduct asbestos-related activities in accordance with SECTION: 02080 — ASBESTOS; ABATEMENT.~~

13.4 — REQUIRED FORMS

~~The Contractor shall complete and return to the Contracting Officer within 15 working days after the completion of all airborne asbestos monitoring conducted under this contract, a "Summarization of Airborne Asbestos Sampling Results" form provided by the Government. This completed summarization form is to be used by the US Army Corps of Engineers for statistical information purposes and does not relieve the Contractor from his recordkeeping requirements as specified in SECTION: 02080 — ASBESTOS; ABATEMENT. A copy of this summarization form is attached to the end of this section.~~

13.5 — COMPLETED SURVEYS

~~An industrial hygiene asbestos survey was conducted in the contract work to identify the presence of asbestos-containing materials as described in 13.2 above. The data collected is contained in the ASBESTOS SURVEY REPORT.~~

13.6 — ADDITIONAL SURVEYS

~~The industrial hygiene asbestos survey described in paragraph 13.5 may not have identified all asbestos containing materials in the contract work area(s). When contract work area(s) appear to have asbestos containing material not identified in the ASBESTOS SURVEY REPORT, the Contractor shall conduct an asbestos survey to identify such material(s) in a manner similar to that described in the ASBESTOS SURVEY REPORT. (CENAB)~~

The points of contact follow:

1. ~~OSHA: (410)962-2840~~
2. ~~EPA, Region 23: 1-800-438-2474; 212-637-5000~~
3. ~~State of Maryland, Department of the Environment, Air Management Administration (410) 631-3200~~
4. ~~Pennsylvania Department of Environmental Resources: (717) 783-2300~~
5. ~~Virginia Council on the Environment: (804) 786-4508~~

~~ALTERNATE 3: THE FOLLOWING CLAUSE SHALL BE INSERTED IN ALL PROJECTS FOUND TO CONTAIN Asbestos WHICH THE CONTRACTOR MAY ENCOUNTER IN THE COURSE OF CONSTRUCTION BUT WHICH DOES NOT INCLUDE Asbestos REMOVAL IN PROJECT SCOPE OF WORK. THIS PARAGRAPH IS NOT TO BE EDITED EXCEPT FOR DELETION OF NOTE BETWEEN PARAGRAPHS 13.7 AND 13.8. AN Asbestos SURVEY REPORT MUST BE INSERTED AT THE END OF THIS SECTION TO ACCOMPANY THIS CLAUSE.~~

13.1 WARNING

THE CONTRACTOR IS WARNED THAT EXPOSURE TO AIRBORNE ASBESTOS HAS BEEN ASSOCIATED WITH FOUR DISEASES: LUNG CANCER, CERTAIN GASTROINTESTINAL CANCERS, PLEURAL OR PERITONEAL MESOTHELIOMA AND ASBESTOSIS. Studies indicate there are significantly increased health dangers to persons exposed to asbestos who smoke and further, to family members and other persons who become indirectly exposed as a result of the exposed worker bringing asbestos-laden work clothing home to be laundered.

13.2 FRIABLE/NONFRIABLE ASBESTOS

The Contractor is advised that friable and/or nonfriable asbestos containing material has been identified on the Somerset Property. Although no asbestos containing materials (ACM) has been identified in area(s) where contract work is to be performed, the Contractor shall take any necessary precautions to safeguard his workers and property owners when working in these areas where the potential for ACM exists. Friable asbestos containing material means any material that contains more than 1 percent asbestos by weight that hand pressure can crumble, pulverize or reduce to powder when dry. Nonfriable asbestos containing materials do not release airborne asbestos fiber during routine handling and end-use. However, excessive fiber concentrations may be produced during uncontrolled abrading, sanding, drilling, cutting, machining, removal, demolition or other similar activities.

13.3 STANDARDS

Care must be taken to avoid releasing or causing to be released, asbestos fibers into the atmosphere where they may be inhaled or ingested. The Occupational Safety and Health Administration (OSHA) has set standards at 29 CFR 1926.58, for exposure to airborne concentrations of asbestos fibers, methods of compliance, medical surveillance, housekeeping procedures and other measures that must be taken when working with or around asbestos containing materials which release airborne asbestos fibers at concentrations in excess of those established in 29 CFR 1926.58. The Environmental Protection Agency (EPA) has established standards at 40 Part 61, Subpart M for the control of asbestos emissions to the environment and the handling and disposal of asbestos wastes.

13.4 PROTECTION

When contract work activities are carried out in locations where the potential exists for exposure to airborne asbestos fibers as described in paragraph 13.2 or where asbestos waste will be generated, the contractor shall assure that all measures necessary to provide effective protection to persons from exposure to asbestos fibers and prevention of contamination to property, materials, supplies, equipment and the internal and external environment are effectively instituted.

13.5 COMPLIANCE WITH REGULATIONS

As a minimum, the contractor shall comply with the provisions of 29 CFR 1926.58, 40 CFR Part 61, Subpart M and 49 CFR 172.101, 172.200-204, 172.316, 173; any state implementing hazardous waste regulation that regulates asbestos as a hazardous waste under the Resources Conservation and Recovery Act (RCRA) requirements and any other applicable federal, state or local requirements.

13.6 ACCIDENT PREVENTION PLAN-ADDITIONAL INFORMATION

In addition to the information required in Contract Clause, "ACCIDENT PREVENTION," of this contract, the Contractors Accident Prevention Plan must also fully address the following topics where the Contractor will be performing any soil disturbance activities in areas identified as containing ACM based on previous surveys and investigations. An Interim Removal Action (IRA) consisting of the removal of loose ACM in buildings and asbestos containing soils on the Somerset Property is proposed and may occur before the work under this contract. Information on the status of the asbestos removal on the Somerset Property will be provided at the Pre-Bid meeting, and, at the Contractor's option may include additional information as applicable.

- 13.6.1 Medical Surveillance: (29 CFR 1926.58(M)).
- 13.6.2 Employee training: Prior to beginning work in asbestos containing material area(s) (29 CFR 1926.58(k) and 29 CFR 1910.134).
- 13.6.3 Respiratory protection: (29 CFR 1926.58(h) and 29 CFR 1910.134).
- 13.6.4 Personal protective clothing and equipment: (29 CFR 1926.58(i) and (j)). The use of compressed air to remove asbestos from workers' clothing is prohibited. The Contractor shall specify the type of change room, wash facilities and laundering facilities as applicable.
- 13.6.5 Airborne asbestos monitoring: (29 CFR 1926.58(f)). Specify the monitoring and analytical procedures to be used prior to, during and after completion of contract work in areas where asbestos containing materials are located. All asbestos monitoring shall be conducted under the guidance of an industrial hygienist certified by the American Board of Industrial Hygiene. Samples shall be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory proficient in the analysis of asbestos and asbestos containing materials. Turn around time from end of sampling period to review of results of analyses by Contractor shall be no longer than 72 hours.
- 13.6.6 Housekeeping: (29 CFR 1926.58(l)). Dry sweeping of contract work areas contaminated with asbestos containing material is prohibited. The Contractor shall specify methods and materials used to package asbestos containing waste and plan to control any accidental airborne release or spill of asbestos containing material.
- 13.6.7 Methods of compliance: (29 CFR 1926.58(g)). Contractor shall include procedures relating to engineering controls, local exhaust ventilation, particular tools to be used and work practices. Specify methods, materials and equipment to be used and work practices. Specify methods, materials and equipment to be used to prevent asbestos contamination to property, materials, supplies, equipment and

the internal and external environment during maintenance, renovation or other contract activities. Local exhaust ventilation equipment including power operated tools equipped with local exhaust ventilation shall conform with the Standard Fundamentals Governing the Design and e~~o~~peration of Local Exhaust Systems ANSI Z9.2 latest revised edition. Describe the type of high-efficiency filtered (HEPA) vacuum cleaners that shall be used to vacuum asbestos containing materials. Describe methods and materials to be used to assure all asbestos containing material will be thoroughly wetted by use of a wetting agent and water before removal and that airborne asbestos dust will be kept to a minimum.

- 13.6.8 Methods and materials to be used to decontaminate any property, materials, supplies, equipment and the environment if asbestos contamination results. (29 CFR 1926.58(g)).
- 13.6.9 Recordkeeping procedures. (29 CFR 1926.58(n)) and 1910.20).
- 13.6.10 Specific description of type of packaging, marking and shipping conveyances to be used to transport asbestos containing waste from the generation point to a storage or disposal facility in compliance with Department of Transportation requirements. (49 CFR 172.101, 172.200-204, 176.316, 173).
- 13.6.11 Emergency procedures that would be taken if an accident or spill of asbestos containing material occurs during the transport of asbestos containing waste. (29 CFR 1926.58(k)).
- 13.6.12 Methods and equipment used to off load and bury asbestos containing waste to control airborne emissions at the burial site. (40 CFR 61.154).
- 13.7 The Contractor shall complete and return to the Contracting Officer within 15 working days after the completion of all airborne asbestos monitoring conducted under this contract, a "Summarization of Airborne Asbestos Sampling Results" form provided by the Government. NOTE: This completed summarization form is to be used by the ~~US~~ Army Corps of Engineers for statistical information purposes and does not relieve the Contractor from his recordkeeping requirements as described in 29 CFR 1926.58(n) and 1910.20.

NOTE: The following additional two paragraphs and statement for bid page shall be incorporated into the contract when the installation has conducted an Industrial Hygiene Asbestos Survey of the contract work area and prepared an ASBESTOS SURVEY REPORT.

- 13.8 ~~An industrial hygiene asbestos survey was conducted at the Somerset Property in the contract work area(s) to identify the presence of asbestos containing materials as described in 13.2 above. The data collected is contained in the ASBESTOS SURVEY REPORT provided as a separate document. inserted at the end of this section.~~
- 13.9 The ~~industrial hygiene~~ asbestos survey described in paragraph 13.8 may not have identified all asbestos containing materials in the contract work area(s). When contract work area(s) appear to have asbestos containing material not identified in the ASBESTOS SURVEY REPORT, the Contractor shall conduct an asbestos survey to identify such material(s) in a manner similar to that described in the ASBESTOS SURVEY REPORT. (CENAB-EN-DT)

The points of contact follow:

1. OSHA: (410) 962-2840
2. EPA, Region 3: 1-800-438-2474.
3. ~~New York State Department of Environmental Conservation (NYSDEC). (518) 474-2121.~~
~~State of Maryland, Dept. of the Environment, Air Management Administration (410) 631-3200).~~

Pennsylvania Dept. of Environmental Resources: (717) 783-2300-

4. New York State Department of Labor (Industrial Code Rule 56): (518) 457-9000.

Virginia Council on the Environmental: (804) 786-4508

INSTRUCTION: ~~(A/E, Designer shall note on the drawings all areas where asbestos has been identified.) (NAB)~~

INSTRUCTION: ~~TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER: INSERT THE FOLLOWING CLAUSE IN ALL PROJECTS AT POSTS WHERE INFORMATION IS PROVIDED.~~

SECTION 14.

PART 14 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER: OMITTED

14.1 TIME EXTENSIONS

~~This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance the contract clause entitled "Default: (Fixed Price Construction)". In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:~~

- ~~a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.~~
- ~~b. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.~~

14.2 SCHEDULE OF MONTHLY ANTICIPATED ADVERSE WEATHER DELAYS

~~The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.~~

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS BASED ON (5) DAY WORK WEEK

- ~~(a) FORT MEADE, NSA, ABERDEEN EDGEWOOD, AND U.S. ARMY LABORATORY CENTER, ADELPHI, MD.~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
7 6 6 7 7 6 4 5 3 5 4 4~~

- ~~(b) WALTER REED, FORT MYER, FORT McNAIR, CAMERON STATION, ARLINGTON HALL STATION, ARLINGTON NATIONAL CEMETERY AND USSAH~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
4 5 6 7 6 6 6 5 2 5 4 3~~

- ~~(c) FORT BELVOIR, HECSA~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~

~~6 6 6 8 6 6 7 5 3 5 5 5~~

(d) ~~VINT HILL FARMS STATION, WARRENTON~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~5 8 7 8 7 5 7 4 4 4 5 6~~

(e) ~~FORT DETRICK~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~7 7 7 5 4 3 3 3 3 4 4 4~~

(f) ~~FORT INDIANTOWN GAP~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~12 6 7 8 8 8 4 5 5 5 4 7~~

(g) ~~GREATER PITTSBURGH INTERNATIONAL AIRPORT~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~14 10 10 11 7 6 6 5 5 5 6 11~~

(h) ~~NEW CUMBERLAND ARMY DEPOT~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~14 7 7 8 8 7 4 5 4 4 5 7~~

(i) ~~FORT RITCHIE & AJCC~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~12 7 7 7 8 7 4 4 4 5 4 5~~

(j) ~~TOBYHANNA~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~17 11 10 9 6 7 6 4 4 5 5 14~~

(k) ~~SCRANTON AAP~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~18 11 7 8 7 7 5 5 3 4 6 10~~

(l) ~~LETTERKENNY ARMY DEPOT~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~12 7 7 9 7 7 6 6 4 5 5 7~~

(m) ~~CARLISLE~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~
~~13 6 7 7 7 6 5 5 4 5 5 7~~

(n) ~~DEFENSE PERSONNEL SUPPORT CENTER~~

~~JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC~~

11 7 8 7 7 6 5 3 3 4 5 7

~~14.3 RECORDKEEPING~~

Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 14.2, above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)".

INSTRUCTION: ~~WORK IN QUARANTINED AREA: EVERY CONTRACT IN STUEBEN COUNTY NEW YORK CONCERNED WITH THE SAMPLING, TRANSPORTATION, STORAGE, TESTING AND DISPOSAL OF SOIL SAMPLES OR INVOLVING CONSTRUCTION WORK ITEMS RELATING TO SOIL AND FOR TRANSPORTING CONSTRUCTION EQUIPMENT SHALL CONTAIN THE FOLLOWING CLAUSE.~~

SECTION 15.

~~PART 15 WORK IN QUARANTINED AREA: OMITTED~~

~~(MAY 1968) The work called for by this contract involves activities in counties quarantined by the Department of Agriculture to prevent the spread of certain plant pests which may be present in the soil. The Contractor agrees that all construction equipment and tools to be moved from such counties shall be thoroughly cleaned of all soil residues at the construction site with water under pressure and that hand tools shall be thoroughly cleaned by brushing or other means to remove all soil. In addition, if this contract involves the identification, shipping, storage, testing, or disposal of soils from such a quarantined area, the Contractor agrees to comply with the provisions of ER 1110 1-5 and attachments, a copy of which will be made available by the Contracting Officer upon request. The Contractor agrees to assure compliance with this obligation by all subcontractors. (CENAB)~~

INSTRUCTIONS: ~~THE FOLLOWING IS TO BE USED IN ALL PROJECT WHERE CONTRACTORS MUST WORK IN CONFINED SPACES.~~

SECTION 16.

~~PART 16 WORK IN CONFINED SPACES:~~

Section 06.I, "Confined Spaces," of EM 385-1-1, U.S. Army Corps of Engineers Health and Safety Requirements Manual (~~OCT 19923 Sept 96~~), is ~~currently being revised and shall not be used by~~ contractors working in confined spaces. ~~Instead~~ In addition, contractors shall refer to OSHA Standard 29 1910.146. (CENAB DEC 1993)

INSTRUCTION: ~~AIRFIELD SAFETY PRECAUTIONS: INSERT THIS CLAUSE IN ALL CONSTRUCTION PROJECTS ON OR NEAR AN AIRFIELD.~~

SECTION 17.

~~PART 17 AIRFIELD SAFETY PRECAUTIONS (DEC 1991) OMITTED~~

~~/(a) Definitions:~~

~~As used in this clause—~~

~~(1) "Landing Areas" means—~~

~~(i) The primary surfaces, comprising the surface of the runways, the runway shoulders, and the lateral safety zones. The length of each primary surface is the same as the runway length. The width of each primary surface is 2,000 feet (1,000 feet on each side of the runway centerline).~~

~~(ii) The "clear zone" beyond the ends of each runway i.e., the extension of the "primary surface" for a distance of 1,000 feet beyond each end of the runway;~~

~~(iii) All taxiways, plus the lateral clearance zones along each side for the length of the taxiways (the outer edge of each lateral clearance zone is laterally 250 feet from the far or opposite edge of the taxiway, e.g., a 75 foot wide taxiway would have a combined width of taxiway and lateral clearance zones of 425 feet); and~~

~~(iv) All aircraft parking aprons plus the area 125 feet in width extending beyond each edge all around the aprons.~~

~~(2) "Safety precaution areas" means those portions of approach departure clearance zones and transitional zones where placement of objects incident to contract performance might result in vertical projections at or above the approach departure clearance surface or the transitional surface.~~

~~(i) The "approach departure clearance surface" is an extension of the primary surface and the clear zone at each end of each runway, for a distance of 50,000 feet, first along an inclined (glide angle) and then along a horizontal plane, both flaring symmetrically about the runway centerline extended.~~

~~(A) The inclined plane (glide angle) begins in the clear zone 200 feet past the end of the runway (and primary surface) at the same elevation as the end of the runway and continuous upward at the slope of 50:1 (one foot vertically for each fifty feet horizontally) to an elevation of 500 feet above the established airfield elevation. At that point the plane becomes horizontal, continuing at the same uniform elevation to a point 50,000 feet longitudinally from the beginning of the inclined plane (glide angle) and ending there.~~

~~(B) The width of the surface at the beginning of the inclined plane (glide angle) is the same as the width of the clear zone; thence it flares uniformly, reaching the maximum width of 16,000 feet at the end.~~

~~(ii) The "approach departure clearance zone" is the ground area under the approach departure clearance surface.~~

~~(iii) The "transitional surface" is a sideways extension of all primary surfaces, clear zones, and approach departure clearance surfaces along inclined planes.~~

~~(A) The inclined plane in each case begins as the edge of the surface.~~

~~(B) The slope of the inclined plane is 7:1 (one foot vertically for each seven feet horizontally). It continues to the point of intersection with—~~

~~(1) The inner horizontal surface (which is the horizontal plane 150 feet above the established airfield elevation) or;~~

~~(2) Outer horizontal surface (which is the horizontal plane 500 feet above the established airfield elevation), whichever is applicable.~~

~~(iv) The "transitional zone" is the ground area under the transitional surface. (It adjoins the primary surface, clear zone and approach departure clearance zone.)~~

~~(b) General.~~

~~(1) The Contractor shall comply with the requirements of this clause while—~~

~~(i) Operating all ground equipment (mobile or stationary);~~

~~(ii) Placing all materials; and~~

~~(iii) Performing all work, upon and around all airfields.~~

~~(2) The requirements of this clause are in addition to any other safety requirements of this contract.~~

~~(c) The Contractor shall—~~

~~(1) Report to the Contracting Officer before initiating any work;~~

~~(2) Notify the Contracting Officer of proposed changes of locations and operations;~~

~~(3) Not permit either its equipment or personnel to use any runway for purposes other than aircraft operation without permission of the Contracting Officer, unless the runway is—~~

~~(i) Closed by order of the Contracting Officer; and~~

~~(ii) Marked as provided in (d)(2) of this clause;~~

~~(4) Keep all paved surfaces, such as runways, taxiways, and hardstands, clean at all times and, specifically, free from small stones which might damage aircraft propellers or jet aircraft.~~

~~(5) Operate mobile equipment according to the safety provisions of this clause, while actually performing work on the airfield. At all other times, the Contractor shall remove all mobile equipment to locations—~~

~~(i) Approved by the Contracting Officer;~~

~~(ii) At a distance of at least 750 feet from the runway centerline, plus any additional distance; and~~

~~(iii) Necessary to ensure compliance with other provisions of this clause.; and~~

~~(6) Not open a trench unless material is on hand and ready for placing in the trench. As soon as practicable after material has been placed and work approved, the Contractor shall backfill and compacted as required by the contract. Mean while all hazardous conditions shall be marked and lighted in accordance with the other provisions of this clause.~~

~~(d) Landing areas.~~

~~The Contractor shall—~~

~~(1) Place nothing upon the areas without authorization of the Contracting Officer.~~

~~(2) Outline those landing areas hazardous to aircraft, using (unless otherwise authorized by the Contracting Officer) red flags by day and with electric, battery operated, low intensity red flasher lights by night.~~

~~(3) Obtain, at an airfield where flying is controlled, additional permission from the control tower operator every time before entering any landing area, unless the landing area is marked as hazardous to aircraft in accordance with (d)(2) of this clause;~~

~~(4) Identify all vehicles it operates in landing areas by means of a flag on a staff attached to and flying above the vehicle. The flag shall be three feet square and consist of a checkered pattern of international orange and~~

~~white square of one foot on each side (except that the flag may vary up to 10 percent from each of these dimensions).~~

~~(5) Mark all other equipment and materials in the landing areas, using the same marking devices as in paragraph (d)(2) of this clause; and~~

~~(6) Perform work so as to leave that portion of the landing area which is available to aircraft free from hazards, holes, piles of material, and projecting shoulders that might damage an airplane tire.~~

~~(c) Safety precaution areas;~~

~~The Contractor shall~~

~~(1) Place nothing upon the safety precaution areas without authorization of the Contracting Officer.~~

~~(2) Mark all equipment and materials in safety precaution areas, using (unless otherwise authorized by the Contracting Officer) red flags by day, and with electric, battery operated, low intensity red flasher lights by night.~~

~~(3) Provide all objects placed in safety precaution areas with a red light or red lantern at night, if the objects project above the approach-departure clearance surface or above the transitional surface. (DOD FAR SUPP 252.236-7005)~~

~~18. WORKING HOURS: (DEC 93) It shall be the Contractors responsibility to obtain the working hours other than the normal five (5) day work week 8:00 am to 4:30 pm. (CENAB CO SQ)~~

~~OMITTED (ATTACHMENT TO SECTION 01030) DEC 88~~

~~TRANSPORTATION CLAUSES FOR CONSTRUCTION PROJECTS~~

~~INSTRUCTIONS: SELECT THE APPROPRIATE CLAUSES FROM THE FOLLOWING AND INSERT AS SUBPARAGRAPH TO PARAGRAPH 2, PHYSICAL DATA, IN SECTION 01030, JOB CONDITIONS OF THE SPECIAL CLAUSES.~~

~~ABERDEEN PROVING GROUND, MD.~~

~~2.1 Transportation Facilities: The facility is off Interstate 95 and U.S. Route 40 and is accessed by public transportation, motor freight and ConRail system.~~

~~ARLINGTON NATIONAL CEMETERY, VA.~~

~~2.1 Transportation Facilities: Project site is accessed by George Washington Memorial Parkway, U.S. Route 395, U.S. Route 50, State Route 244 (Columbia Pike). Transportation to the cemetery is via bus service and motor freight.~~

~~FORT BELVOIR, VA.~~

~~2.1 Transportation Facilities:~~

~~2.1.1 Highway Network: The principal access routes to Fort Belvoir are U.S. Route 1 (Jefferson Davis Highway) from the east and west, State Highway 611 (Telegraph Road) from the northeast, State Highway 617 (Backlick Road) from the north, and State Highway 235 (Mount Vernon Memorial Highway) from the east. Minor access is provided by State Highway 613 (Beulah Road) and State Highway 622 (Pole Road).~~

~~2.1.2 — Bus Service: Internal post mass transportation is limited to the use of post carryalls augmented by buses during peak demand periods. Presently, public bus service is provided by the Washington Metropolitan Area Transit Service.~~

~~2.1.3 — Railroad: Rail service to Fort Belvoir is provided by a Government owned spur of the Richmond, Fredericksburg and Potomac Railroad.~~

~~CAMERON STATION, VA.~~

~~2.1 — Transportation Facilities: The project site is off Shirley Highway and is accessed by public transportation, motor freight and Southern Railroad.~~

~~CAPE HENLOPEN USARC, DE.~~

~~2.1 — Transportation: Cape Henlopen USARC Center is located in Lewes, Delaware at Savannah Road & Rte 28. USARC is accessible by motor freight.~~

~~CARLISLE BARRACKS, PA.~~

~~2.1 — Transportation Facilities: The post abuts interstate I 81 to the south and the Pennsylvania Turnpike I 76 to the north. Scheduled air passenger service is via Harrisburg International Airport. Private and business aircraft may use the Carlisle Airport. Rail service is provided to Carlisle by Conrail and the Reading line. Bus transportation is by Greyhound, Wolf and the public owned Capital Area Transit.~~

~~CLINTON USARC, PA.~~

~~2.1 — Transportation Facilities: USARC is off U.S. Route 30 about 12 miles west of Pittsburgh and is accessed by motor freight.~~

~~DEREY BUILDING, RESTON, VIRGINIA~~

~~2.1 — Transportation Facilities: The Dery Engineering Building is located at 1860 Wiehle Ave., Reston, VA and is accessible by motor freight. There is no direct rail access.~~

~~FORT DETRICK, MD.~~

~~2.1 — Transportation Facilities: Fort Detrick's main post is north and contiguous to the city of Frederick, with access via city streets and county roads. The Frederick by pass, U.S. Route 15, connects with Interstate 70 S and 270, U.S. Routes 40, 15, 340 and Md. Route 26 and provides easy access to West Seventh Street approximately one half mile south of the main gate of Fort Detrick, to Oppossumtown Pike which serves as access to the East Coast Telecommunications Center area and to Rosemont Avenue (West 4th Street) which serves the two west gates of the installation. Montevue Lane and Rocky Springs Road connect the main post with Area "B". There is no direct rail access.~~

~~DOVER AIR FORCE BASE, DE.~~

~~2.1 — Transportation Facilities: Dover AFB is located on U.S. Route 113, 4.5 miles south of metropolitan Dover. There is no direct rail access.~~

~~DEFENSE PERSONNEL SUPPORT CENTER, PA.~~

~~2.1 — Transportation Facilities: Defense Personnel Support Facility is located on Vare Ave. and is accessible by public transportation and rail service.~~

~~GENEVA USARC, PA.~~

- 2.1 — ~~Transportation Facilities: USARC is located on L.R. 20147 (Watson Road) and State Route 285. Nearest major highway is Interstate Route 79. Project site is accessed by motor freight.~~

~~HAGERSTOWN USARC, MD.~~

- 2.1 — ~~Transportation Facilities: From Interstate 70 take U.S. Route 40 west to Hagerstown. Turn right at North Cleveland Ave. and right on East Franklin Street to Willard Ave. This facility is accessible by motor freight and privately owned vehicles.~~

~~U.S. ARMY LABORATORY CENTER, ADELPHI, MD.~~

- 2.1 — ~~Transportation Facilities: U.S. Army Laboratory Center is located on the grounds of the Naval Weapons Center. Major access roads are U.S. Route 650, New Hampshire Avenue and U.S. Route 212, Powder Mill Road. These roads are connected to U.S. Routes 29 and 495. Public transportation is available to project site.~~

~~HUMPHREY ENGINEER CENTER, VA.~~

- 2.1 — ~~Transportation Facilities:~~

- 2.1.1 — ~~Highway Network: The principal access route to Humphrey's Engineering Center is State Highway 611 (Telegraph Road).~~

- 2.1.2 — ~~Bus Service: Public bus service is provided by the Washington Metropolitan Area Transit Service.~~

- 2.1.3 — ~~Railroad: There is no rail service to Humphrey's Engineering Center. However, rail service to Fort Belvoir is provided by a Government owned spur of the Richmond, Fredericksburg and Potomac Railroad.~~

~~FORT INDIANTOWN GAP, PA.~~

- 2.1 — ~~Transportation Facilities:~~

- 2.1.1 — ~~Highways: State Routes No. 72, 443 and 934 provide service directly into the post. State Route 934 is a connecting Route with Interstate 81.~~

- 2.1.2 — ~~Railroads: There is no direct rail access to the post.~~

~~LETTERKENNY~~

- 2.1 — ~~Transportation Facilities: Local highways connect the Depot with Interstate 81 and 30. Railroad trackage within the Depot connects with Con Rail.~~

~~LEWISBURG USARC, PA.~~

- 2.1 — ~~Transportation Facilities: Project site is off U.S. Route 15 about 1 mile north of Lewisburg and is accessible by motor freight.~~

~~FORT MCNAIR, WASHINGTON, D.C.~~

- 2.1 — ~~Transportation Facilities: Fort McNair is accessible to Interstate 295 and 395, via the Southwest Expressway and is served by the Washington Metropolitan Area Transit Authority (METRO) Bus system. Entrance for truck traffic and access to employee parking lot is on P Street, SW, near Canal Street. Fort McNair does not have direct rail access. There are no waterfront operational facilities (piers or moorings) at the installation.~~

~~FORT MEADE, MD.~~

- ~~2.1 Transportation Facilities: The principal access roads are Maryland Routes 198, 32 and 175. These State Highways also connect to the other major highways, U.S. 1 and I 95. There is no current rail service to Fort Meade. The Maryland Department of Transportation provides daily bus service between the Fort and downtown Baltimore and the Baltimore Washington International Airport.~~

~~FORT McHENRY, MARYLAND~~

- ~~2.1 Transportation Facilities: Fort McHenry is in South Baltimore at the end of Fort Avenue. Nearest major route is Interstate Route 95. Site is accessed by public transportation and motor freight.~~

~~FORT MYER, VA.~~

- ~~2.1 Transportation Facilities: Fort Myer is ringed by two primary roads; Arlington Boulevard (U.S. Route 50) on the northern and northwestern sides and Washington Boulevard (State Route 27) on the southwestern side. Public transportation is available to and from the post. No rail service is available at the present time.~~

~~NEW CASTLE USARC, PA.~~

- ~~2.1 Transportation Facilities: USARC is located on the western outskirts of New Castle in the block bordered by Grandview Ave., Washington St. and Miller Ave. Site is accessed by public transportation and motor freight.~~

~~NEW CUMBERLAND ARMY DEPOT, PA.~~

- ~~2.1 Transportation Facilities: Local highways connect the depot with Interstates 76 and 83. Railroad trackage within the depot connects with Con Rail.~~

~~NEW MARTINSVILLE USARC, W. VA.~~

- ~~2.1 Transportation Facilities: USARC is located on State Route 2 about 1/4 mile north of New Martinsville between Route 2 and the Ohio River. Site is accessed by motor freight.~~

~~PENTAGON BUILDING, ARLINGTON, VA.~~

- ~~2.1 Transportation Facilities: The Pentagon Building is located at the junction of State Routes 27 and 110 and Interstate 395 and is accessible by motor freight.~~

~~FORT RITCHIE, MD.~~

- ~~2.1 Transportation Facilities: Fort Ritchie is located along State Route No. 81 between Highfield, Maryland and Den Mar, Maryland in commuting distance of Hagerstown and Frederick, Maryland and Waynesboro and Gettysburg, Pennsylvania.~~

~~FORT RITCHIE, AJCC~~

- ~~2.1 Transportation Facilities: The project site is accessible by public highway. There is no direct rail access.~~

~~SCHUYLKILL HAVEN USARC, PA.~~

- ~~2.1 Transportation Facilities: U.S.A.R.C. is located on State Route 61 between Pottsville and Schuylkill Haven. Site is accessible by public transportation, motor freight and railroad.~~

~~SCRANTON ARMY AMMUNITION PLANT, PA.~~

~~2.1 — Transportation Facilities:~~

~~2.1.1 — Highways: The main gate is on Cedar Avenue about one mile from Interstate 81. The SAAP is also accessible to U.S. 6, 11 and 611.~~

~~2.1.2 — Railroads: A branch line of CONRAIL serves SAAP.~~

~~2.1.3 — Airports: The Wilkes-Barre/Scranton Airports serve the area with several airlines providing scheduled service.~~

~~2.1.4 — Public Transit: The County of Lackawanna Transit System (COLTS) bus line serves SAAP.~~

~~STATE COLLEGE USARC, PA.~~

~~2.1 — Transportation Facilities: Project site is located at junction of PA. L.R. 14016, Fox Hollow Rd. and Big Hollow Rd. Major access route is State Route 322, N. Atherton St. Site is accessed by public transportation and motor freight.~~

~~TOBYHANNA ARMY DEPOT, PA~~

~~2.1 — Transportation Facilities: Tobyhanna Army Depot is accessible by public transportation and motor truck freight. The depot is served by Interstate Route 380 and Midway Road.~~

~~U.S. SOLDIERS' AND AIRMEN'S HOME, WASHINGTON, D.C.~~

~~2.1 — Transportation Facilities: The project site is off N. Capital Street, N.W. Washington, DC and is accessed by public transportation and motor freight.~~

~~VINT HILL FARMS STATION, VA.~~

~~2.1 — Transportation Facilities:~~

~~2.1.1 — Vint Hill Farms Station is located along State Routes 652 and 215, approximately 2.5 miles south of the intersection with U.S. Routes 15, 29 and 211 (Lee Highway). Lee Highway is a major east-west route between Washington, D.C. and Warrenton, Virginia. There is also access at Gainesville, Virginia from Lee Highway to Interstate Route 66 which runs from Washington, D.C. to Front Royal, Virginia.~~

~~2.1.2 — Access to the installation for employees and visitors is by automobile; commercial transportation services are not available.~~

~~2.1.3 — Air transportation to the area is also available through the facilities of the Dulles International Airport and the Warrenton Fauquier Airport, a general utility airport south of Midland, Virginia.~~

~~WALTER REED ARMY MEDICAL CENTER FOREST GLEN SECTION~~

~~2.1 — Transportation Facilities: The main access to the Forest Glen Section is via Forest Glen Road and Linden Lane. The distance along these roads from the post to State Route 97 (Georgia Avenue) is approximately three-quarters of a mile. There is no public bus service available directly to Forest Glen. There are no railroad facilities.~~

~~WALTER REED ARMY MEDICAL CENTER MAIN SECTION~~

- 2.1 ~~Transportation Facilities: Georgia Avenue, N.W. (Md. 97) and 16th Street, N.W. (U.S. 29/Md. 390) provide access to the Main Section from the Capital in the south and to the Beltway (I 495). Bus service, via Georgia Avenue (70's lines) with transfers, is available to virtually all of metropolitan Washington. Bus lines also serve Alaska Avenue (B, Q and S lines) and 16th Street (Q, S & Y lines and line 56). There are no railroad facilities.~~

~~WARRENTON TRAINING CENTER, VA.~~

- 2.1 ~~Transportation Facilities: Warrenton Training Center is in the vicinity of Warrenton, Virginia which is approximately 50 miles southwest of Washington, DC. Major highways serving Warrenton are Interstate 66 and U.S. Routes 15, 17, 29 and 211.~~

~~WILMINGTON USARC, DE.~~

- 2.1 ~~Transportation: USARC is located in the 3900 block of State Route 2 (Kirkwood Highway). Site is accessed by motor freight.~~

PART 818 PHOTOGRAPHIC COVERAGE: (SEPT 85)

The Contractor shall provide photographic coverage under the contract. These services shall be for ten commercial grade color photographs every three months from the beginning of the contract until acceptance of the completed work. At a minimum, photographs shall be taken at onset, once during construction, and once at completion. These photographs shall be in 8" x 10" size and shall be taken at intervals and at the place designated by the Contracting Officer. Negatives from all of the above photographs shall be given to and become property of the Government. (CENAB-CO)

--End of Section--

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes Text Adjustment change 1 (November 1994)~~

~~Includes changes through Notice 1 (August 1995)~~

~~Latest Notice change indicated by \&&\ tokens~~

SECTION 01110

SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW/UST)

04/94

~~NOTE: This guide specification covers the~~
~~requirements for safety and health documents and~~
~~procedures for hazardous, toxic, and radioactive~~
~~waste (HTRW) site activities and underground storage~~
~~tank (UST) removals. This guide specification is~~
~~to be used in the preparation of project~~
~~specifications in accordance with ER 1110 345 720.~~

PART 1 GENERAL

~~\&&\~~

1.1 REFERENCES

~~NOTE: Issue (date) of references included in~~
~~project specifications need not be more current than~~
~~provided by the latest change (Notice) to this guide~~
~~specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH-02

~~\&(1995) 1995 1996&1997 1998\~~ Threshold Limit Values for Chemical
Substances and Physical Agents and Biological Exposure Indices

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z358.1 (1990) Emergency Eyewash and Shower Equipment

AMERICAN PETROLEUM INSTITUTE (API)

\&API Std 2015(1994) &\ Safe Entry and Cleaning of Petroleum Storage Tanks

API Publ 2219 (1986) Safe Operation of Vacuum Trucks in Petroleum Service

API RP 1604 (1987; Supple 1990) Removal and Disposal of Used Underground Petroleum Storage Tanks

CODE OF FEDERAL REGULATIONS (CFR)

10 CFR 20 Standards for Protection Against Radiation

29 CFR 1904 Recording and Reporting Occupational Injuries and Illnesses

29 CFR 1910 Occupational Safety and Health Standards

29 CFR 1926 Safety and Health Regulations for Construction

49 CFR 171 General Information, Regulations, and Definitions

49 CFR 172 Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

ENGINEERING MANUALS

EM 385-1-1 (19921996) US Army Corps of Engineers Safety and Health Requirements Manual

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 85-115 (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

1.2 DESCRIPTION OF WORK

This section provides additional requirements for implementing the accident prevention provisions of EM 385-1-1, and specifies a Site Safety and Health Plan (SSHP) which shall satisfy the requirements for submission of a separate Accident Prevention Plan (APP) as required by EM 385-1-1. The requirements shall apply to work performed in both "contaminated" and "clean" areas.

1.3 SUBMITTALS

NOTE: Submittals must be limited to those necessary
for adequate quality control. The importance of an
item in the project should be one of the primary

~~_____ factors in determining if a submittal for the item~~
~~_____ should be required. Consult with the construction~~
~~_____ district Engineering, Construction, and Safety and~~

~~_____ Occupational Health Offices in making each submittal~~
~~_____ classification determination.~~

~~_____ Indicate submittal classification in the blank space~~
~~_____ using "GA" when the submittal requires Government~~
~~_____ approval or "FIO" when the submittal is for~~
~~_____ information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300: SUBMITTAL PROCEDURES.

SD-04 Drawings

Work Zones; [GA].

Drawings shall include initial work zone boundaries: Exclusion Zone (EZ), including restricted and regulated areas; Contamination Reduction Zone (CRZ); and Support Zone (SZ).

Decontamination Facilities; [GA].

Drawings shall show the layout of the personnel and equipment decontamination [areas] [facilities].

SD-09 Reports

Monitoring/Sampling Results; [FIO].

Personnel exposure monitoring/sampling results.

Site control log; [FIO].

Record of each entry and exit into the site, as specified.

1.4 REGULATORY REQUIREMENTS

Work performed under this contract shall comply with EM 385-1-1, applicable Federal, state, and local safety and occupational health laws and regulations. This includes, but is not limited to, Occupational Safety and Health Administration (OSHA) standards, 29 CFR 1910, especially Section .120, "Hazardous Waste Site Operations and Emergency Response" and 29 CFR 1926, especially Section .65, "Hazardous Waste Site Operations and Emergency Response." Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

1.5 PRECONSTRUCTION SAFETY CONFERENCE

~~NOTE: Specify requirements to be addressed in the
preconstruction safety conference. Confer with the
construction district's construction and Safety and
Occupational Health Office representatives to make
this determination. If this conference is addressed
in another specification section, reference the
appropriate section.~~

Prior to commitment of any work at the job site, a preconstruction safety meeting shall be held between the Contractor and the U.S. Army Corp of Engineers (USACE) New York District, the USACE local area construction division and the Safety and Occupational Health Office representatives to discuss the Contractor's Safety Program and in particular to discuss comments on the Site Safety and Health Plan. This meeting shall be coordinated with the Preconstruction Plan Review conference specified in Section 01500: TEMPORARY CONSTRUCTION FACILITIES

1.6 SAFETY AND HEALTH PROGRAM

OSHA Standards 29 CFR 1910, Section .120 (b) and 29 CFR 1926, Section .65 (b) require employers to develop and implement a written Safety and Health Program for employees involved in hazardous waste operations. The site-specific program requirements of the OSHA Standards shall be integrated into one site-specific document, the Site Safety and Health Plan (SSHP). The SSHP shall interface with the employer's overall Safety and Health Program. Any portions of the overall Safety and Health Program that are referenced in the SSHP shall be included as appendices to the SSHP.

1.7 SITE SAFETY AND HEALTH PLAN

1.7.1 Preparation and Implementation

A Site Safety and Health Plan (SSHP) shall be prepared covering onsite work to be performed by the Contractor and all subcontractors. The Safety and Health Manager shall be responsible for the development, implementation and oversight of the SSHP. The SSHP shall establish, in detail, the protocols necessary for the anticipation, recognition, evaluation, and control of hazards associated with each task performed. The SSHP shall address site-specific safety and health requirements and procedures based upon site-specific conditions. The level of detail provided in the SSHP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial SSHP is prepared and submitted. Therefore, the SSHP shall address, in as much detail as possible, anticipated tasks, their related hazards and anticipated control measures. Additional details shall be included in the activity hazard analyses as described in paragraph ACTIVITY HAZARD ANALYSES.

1.7.2 Acceptance and Modifications

Prior to submittal, the SSHP shall be signed and dated by the Safety and Health Manager and the Site Superintendent. Eight copies or as directed by the Contracting Officer of the SSHP shall be submitted with at least one copy submitted to NYSDEC, CWM and Somerset Property Owners, for review ☐ 30 days prior to the Preconstruction Safety Conference. Deficiencies in the SSHP will be discussed at the preconstruction safety conference, and the SSHP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written SSHP shall be maintained onsite. As work proceeds, the SSHP shall be adapted to new situations and new conditions. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site

Superintendent, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Site Safety and Health Officer (SSHO) shall bring such hazard to the attention of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, necessary action shall be taken to re-establish and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Disregard for the provisions of this specification or the accepted SSHP shall be cause for stopping of work until the matter has been rectified.

1.7.3 Availability

The SSHP shall be made available in accordance with 29 CFR 1910, Section .120 (b)(1)(v) and 29 CFR 1926, Section .65 (b)(1)(v).

1.7.4 Elements

Topics required by 29 CFR 1910, Section .120 (b)(4) 29 CFR 1926, Section .65 (b)(4) and the Accident Prevention Plan as described in Table 1-1 of EM 385-1-1 and those described in this section shall be addressed in the SSHP. Where the use of a specific topic is not applicable to the project, the SSHP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic.

1.8 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

1.8.1 Project/Site Conditions

NOTE: Provide the "Site Description and Contamination Characterization" information that was developed for the Health and Safety Design Analysis. Include as much information about the site as possible (i.e., tell the Contractor everything we know about the site.) Depending on the amount of information provided, it may be more appropriate to present a summary of the contaminants in this paragraph and provide the bulk of the information as an attachment at the end of this section. If a summary is provided it should include contaminant chemical names, concentration ranges, media in which found, and locations onsite. Include a complete list of documents (Remedial Investigation/Feasibility Study reports (RI/FS), other investigation reports, Record of Decision (ROD), etc.) and state the name and location of the repository containing site information (often this is the local library). If this information is provided in another specification section, it need not be repeated but the appropriate section will be referenced in this paragraph. If this is a UST removal project, include the paragraph addressing USTs.

The following information is a record of site contaminants and a description of the site. This information is provided to assist in preparing the SSHP. Additional sources of information are available as listed below.

1.8.1.1 Site Information

~~The underground storage tanks addressed by this project have been confirmed as having contained petroleum, solvents, pesticides, chemicals, fuels, [] []~~ Area specific analytical data which provides the contaminants detected, concentration ranges, media in which found and locations within the area are provided as attachments to the following sections:

Section 02228 FLUSHING AND CLOSURE IN PLACE OF TNT PIPELINE

Section 02142 REMEDIATION OF CHEMICAL WASTE SEWERS AND LIFT STATIONS.

Previous investigations have shown the presence of a variety of contaminants in varying concentrations. Representative compounds are included in Table 01110-1. The classes of chemicals that may be present at the LOOW site include volatile organic solvents, nitroaromatics, heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mineral acids, caustics, fuel oils and gasoline, and asbestos. These compounds may pose inhalation and/or dermal hazards when contacted. Table 01110-1 summarizes the primary health effects associated with these chemicals. Table 01110-2 provides suggested actions to be taken based on field measurements of chemical contaminant hazards. The Contractor is responsible for developing his own action levels and response as part of the Contractor's SSHP.

1.8.1.2 List of Available Documents

Further information is available from the following site documents that are available for review by request at USACE Baltimore District, City Crescent Building, 10 South Howard Street, Baltimore, MD. Requests can be made through Ms. Justine Wesley at (410) 962-6734.

- Safety, Health and Emergency Response Plan date April 1988.
- Remedial Investigation Report dated August 1990.
- Advanced Feasibility Study Report dated September 1990.
- Site Safety and Health Plan dated September 1991.
- Sampling and Analysis Plan dated December 1992.
- Preliminary Contamination Assessment Report dated December 1992.
- Hydrogeologic Characterization Update dated June 1993.
- Engineering Evaluation/Cost Analysis dated March 1995.
- Final Sampling and Analysis Plan and Site Safety and Health Plan dated October 1996.
- Final PRDI Report dated May 1997.

1.8.2 Plan Requirements

The SSHP shall include a site description and contamination characterization section that addresses the following elements:

- a. Description of site location, topography, size, and past uses of the site.
- b. A list of contaminants that may present occupational health and safety hazards. This list shall be created by evaluating the analytical results in this section and by researching sources of information from past site investigation activities. [Chemical names, concentration ranges, media in which found, locations onsite, and estimated quantities/volumes to be impacted by site work shall be included if known.] [Chemical names, radioisotopes, concentration ranges and strength of radiation fields and levels of radioactive contamination, media in which found, locations onsite, and estimated quantities/volumes to be impacted by site work shall be included if known.] The contamination characterization shall be reviewed and revised if new chemicals are identified as work progresses.

1.8.3 Ordnance and Explosive Waste (OEW) - TNT Pipeline

NOTE: Delete this paragraph if the presence of OEW
is not suspected.

The Contractor shall provide an Explosives Operations Plan as part of his SSHP. If potentially explosive crystalline material is explosives, chemical surety and warfare materials (CSM/CWM), or unexploded ordnance (UXO) are discovered at any time during operations, the Contractor shall immediately stop operations in the affected area, mark the location, notify onsite personnel of the OEW potential explosive hazard and the area's restrictions, and notify the Contracting Officer. The Government Contractor's subcontracted Explosives Expert will make appropriate arrangements for evaluation and proper disposal of each device the crystalline material. The Contractor's Explosives Expert shall be responsible for the handling and transport of any crystalline/detonable material in a safe manner to the adjacent New York Army National Guard property as pre-arranged by the USACE. The Contractor's Explosives Expert shall then be responsible for the treatment and disposal of the crystalline material. The Explosives Operation Plan as part of the SSHP shall specifically address procedures to be followed, if known or potential explosive material CSM/CWM, ordnance, or other such items are encountered during any phase of field work. The Explosives Operations Plan shall be prepared by the Explosives Expert and include procedures for excavation of the TNT pipeline, and the handling, storage, transportation, treatment and disposal of crystalline/detonable materials.

1.9 HAZARD/RISK ANALYSIS

The SSHP shall include a safety and health hazard/risk analysis for each site task and operation to be performed. The hazard/risk analysis shall provide information necessary for determining safety and health procedures, equipment, and training to protect onsite personnel, the environment, and the public. Available site information shall be reviewed when preparing the "Hazard/Risk Analysis" section of the SSHP. The following elements, at a minimum, shall be addressed.

1.9.1 Site Tasks and Operations (Workplan)

NOTE: Develop a list of anticipated major site tasks and operations based on the type of remediation required. Include operation and maintenance if appropriate. Also use this list to determine initial minimum levels of PPE. See paragraph PERSONAL PROTECTIVE EQUIPMENT.

The SSHP shall include a comprehensive section that addresses the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives. Based on the type of remediation required for each area covered under the specific bid package, the following is a list of area-specific anticipated major site tasks and operations to be performed:

- Chemical Waste Sewer Systems - CWM and Somerset Properties (Components 1 and 2)
 - a. Mobilization.
 - b. Removal of liquids from sewer.
 - c. Removal of sludges and cleaning of lift stations.
 - d. Flushing of sewer.
 - e. Liquids handling and storage.
 - f. Solids handling and containerization.
 - g. Disposal.
 - gh. Site restorations.
- INT Pipeline
 - a. Mobilization (staging areas, stockpile areas, E&S controls, etc.).
 - b. Establishment of sumps and accessing pipeline.
 - c. Removal of pipeline liquids.
 - d. Removal of designated sections of pipeline.
 - e. Flushing of designated sections of pipeline confirmation sampling.
 - g. Handling of sediments (removal, dewatering, storage, and containerization).
 - h. Dewatering and liquids handling.
 - i. Handling of removed pipe material.

j. Disposal

k. Backfill and grading

l. Site restoration

This is not a complete list of site tasks and operations, therefore, it shall be expanded and/or revised, during preparation of the SSHP as necessary.

1.9.2 Hazards

NOTE: Include a list of hazards expected to be encountered during site activities. Evaluate safety hazards (e.g. excavations, slips, trips, and falls; electricity, equipment and machinery, etc.); chemical hazards, physical agents (e.g. noise, heat and cold stress, vibration, etc.); radiological hazards (e.g. hazards caused by radioactive materials or ionizing radiation fields); and biological hazards (e.g. poisonous plants, animals and microorganisms).

The following potential hazards may be encountered during site work. These are not complete lists, therefore, they shall be expanded and/or revised as necessary during preparation of the SSHP.

1.9.2.1 Safety Hazards

[] The following subsections provide a summary of the general sitewide chemical, radiation, biological, physical, and explosive hazards. During previous investigations contamination was detected in samples from the TNT pipeline, Air Force Plant 68 (AFP-68) chemical waste sewer systems, and areas of the Somerset property. For the purposes of preparing the SSHP, these parameters may be considered representative of the types of contaminants that are or may be present in the study areas.

1.9.2.2 Chemical Hazards

Potential chemical hazards that may be encountered during site work are discussed in paragraph SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION. The Hazard/Risk Analysis section of the SSHP shall describe the chemical, physical, and toxicological properties of contaminants, sources and pathways of employee exposures, anticipated onsite and offsite exposure level potentials, and regulatory (including Federal, state, and local) or recommended protective exposure standards. The SSHP shall also address employee exposure to hazardous substances brought onsite, and shall comply with the requirements of 29 CFR 1910, Section .1200 and 29 CFR 1926, Section .59, Hazard Communication.

1.9.2.3 Physical Agents

[]:

1.9.2.43 Radiological Hazards

Historical data have indicated that alpha-emitting radioactive wastes may be present at the LOOW site. However, an Environmental Impact Statement (EIS) prepared for the Department of Energy (DOE) addressing the Niagara Falls Storage Site (document #DOE/EIS-0109F) estimated the cumulative radiation dose to the general public resulting from wastes buried at this site to be less than 0.001 rem as a whole body dose. The radioisotopes of primary concern are radium-226 and its progeny, natural decay products of uranium-238. Alpha emission is the decay product of concern for these species. Alpha radiation presents an inhalation hazard by adhering to dust particles. No soil activity levels are available for the areas of concern; however, based on the results of the EIS, it is anticipated that dust control techniques to maintain airborne dust concentrations to below the nuisance levels will be sufficient to protect against alpha particles. Because alpha radiation has a low ability to penetrate body surfaces, Level D protection is sufficient to prevent skin contact and damage from alpha-emitting radioisotopes.

Dust control techniques shall be used to minimize hazards due to the potential inhalation of dust carrying radioisotopes. A direct-reading instrument shall be used to detect levels of alpha, beta, gamma, and X-ray radiation. Table 01110-2 lists suggested actions to be taken at various levels of radiation hazard. These levels are specific to gamma and x-rays. Since gamma and x-rays can readily penetrate protective clothing, all personnel shall evacuate the work area if real-time monitoring shows radiation activity levels exceeding 1 milliroentgen per hour (mR/hr). Typical background readings established during the previous investigation surveys at the LOOW site were 0.03 to 0.04 mR/hr. The Contractor is responsible for developing his own action levels and appropriate responses as part of the Contractor's SSHP.

Table 01110-2 describes the suggested actions that shall be taken if radiation levels reach or exceed background levels. Radiation detector meters able to detect alpha, beta, and gamma radiation shall be used to monitor the excavation and sampling activities. If at any time the radiation levels exceed background levels, work shall stop, the Contract Officer shall be contacted, and the situation assessed. If readings continue above background, thermoluminescent detector (TLD) badges will be issued to all site personnel and work may continue if levels are below 3 times background and < 1.0 mR/hr.

If consistent real-time monitoring shows a radiation level below 1.0 mR/hr throughout site activities, the TLD badges shall be analyzed at the completion of site activities. The radiation dose will be included in the employee's permanent medical record. Should radiation levels exceed 1.0 mR/hr during any work shift, the affected employees' badges shall be collected and analyzed at the end of that work week. New badges shall be issued at the beginning of the next work week.

1.9.2.54 Biological Hazards

The presence of standing water in various areas of the LOOW site harbors a relatively large population of waterborne insects, including mosquitoes. Mosquitoes are the vector for a variety of diseases; however, mosquito bites more commonly cause only local discomfort. The use of dermal protection (long sleeves, gloves, pants) limits skin accessibility to insect bites. Personnel may also use a variety of insect repellents or mosquito netting.

Other stinging insects such as yellow jackets, hornets, and wasps are also prevalent at the LOOW site. Stings from these insects typically produce local irritation; however, some individuals may suffer allergic reactions to these types of venom.

Poison ivy and other allergenic plants are also abundant at the LOOW site. Many of the proposed areas are overgrown with vegetation. The clearing of vegetation and use of dermal protection such as long

sleeves and pants shall also guard against contact with plant resins. Persons who are allergic to these types of plants may also use a barrier cream on exposed areas.

1.9.2.5 Physical Hazards

Physical hazards, such as slippery or irregular surfaces, abrasive materials, fire and explosion hazards, noise, and malfunctioning equipment are inherent to all construction activities. Prevention of injuries and accidents shall be a high priority. The following subsections identify procedures that shall be followed in order to reduce potential physical hazards during the IR-Interim remedial action.

Accident prevention

All site personnel shall be instructed on the contents of this SSHP prior to the initiation of site activities. The Site and Safety Officer (SSO) shall ensure that all employees may access the SSHP at any time during site activities. The SSHP shall be kept on file with the SSO.

The following precautions shall be required in order to minimize slipping, falling, and tripping hazards:

- All active trenches, manholes, and sumps shall be marked by construction hazard tape or flags.
- All completed/abandoned trenches shall be backfilled and graded.
- All debris, trees, and brush in the work area shall be cleared and disposed of at an off-site approved facility.
- Personal chemical protective clothing sizes shall be selected so that garment fit is neither loose nor restrictive.
- If airline respirators are used, the SSO shall observe the lines and straighten bends, kinks, and tangled lines.

The following precautions shall be taken to minimize fire and explosion hazards:

- Fire extinguishers rated for Class A, B, and C fires shall be maintained on the excavator. Excavator operators shall be trained in the proper use of fire extinguishers. All extinguishers shall be routinely inspected and recharged after use.
- Nonsparking pipe cutters shall be used for the cutting of process pipes, if necessary.
- No smoking or open fires/flames shall be permitted in the exclusion zone or contamination reduction zone.
- All trenches shall be monitored for combustible gases and vapors.

Abrasion injuries shall be prevented through the use of outer leather work gloves. These gloves shall be used as needed by the excavator operator and the excavator operator's helpers.

If electrical service is provided at the site for use, ground fault interrupters shall be installed on all extension cords. Extension cords shall be routinely inspected. All portable electric hand tools shall be inspected routinely. Cords shall be replaced if there is visible damage to insulating material. No electrical equipment shall be used during wet weather (rain, snow, fog).

The following lifting procedures shall be used when manually lifting objects:

- Inspect the ground around the object and the route over which it will be carried.
- Remove all obstructions and spilled materials from the path of travel.
- Make sure that clearances between pieces of equipment are sufficient for removal of the object.
- Inspect the object to determine the safest way to grasp it.
- Dry any wet or greasy objects.
- Position the body with feet parted (one foot alongside the object, the other behind).
- Use a sit-down position, keeping the back straight.
- Draw the load close to the body, with arms and elbows tucked to the side of the body.
- Extend the fingers and hand around the object using the full palm.
- Tuck in the chin, keeping the neck and head in line with back.
- Position the body so weight is centered over the feet. Start the lift with a thrust of the rear foot.
- Use hand-trucks, forklift trucks, or hoists to move any objects that cannot be lifted comfortably.

1.9.2.6 Explosive Hazards

The Contractor shall provide an Explosives Operations Plan as part of his SSHP for remediation of the buried TNT sewer pipelines. Previous investigations have indicated that the TNT pipeline system contains nitroaromatic compounds, primarily TNT, as well as other organic contaminants. The presence of nitroaromatics in the pipeline system presents a potential explosion hazard. The Contractor's Explosives Operations Plan shall be prepared by an experienced explosives/ordnance specialist and shall include procedures and engineered controls to address the potential explosive hazard.

1.9.3 Action Levels

1.9.3.1 General

Action levels shall be established for the situations listed below, at a minimum. The action levels and required actions (engineering controls, changes in PPE, etc.) shall be presented in the SSHP in both text and tabular form. Suggested Actions are presented on Table 01110-2. The Contractor is ultimately responsible for developing his own action levels and responses to be approved as part of his SSHP.

- a. Implementation of engineering controls and work practices.
- b. Upgrade or downgrade in level of personal protective equipment.
- c. Work stoppage and/or emergency evacuation of onsite personnel.
- d. Prevention and/or minimization of public exposures to hazards created by site activities.

1.9.3.2 Confined Space Entry

Entry into and work in a confined space will not be allowed when oxygen readings are less than 19.5% or greater than 23.5% or if the Lower Flammable Limit (LFL) reading is greater than 10%, unless these conditions are adequately addressed in the confined space entry program. In addition, action levels for toxic atmospheres shall be determined.

1.10 ACTIVITY HAZARD ANALYSES

Prior to beginning each major phase of work, an Activity Hazard Analysis shall be prepared by the Contractor performing that work and submitted for review and acceptance. The format shall be in accordance with EM 385-1-1, figure 1-1. A major phase of work is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform. The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government onsite representatives. The activity hazard analyses shall be continuously reviewed and when appropriate modified to address changing site conditions or operations, with the concurrence of the Safety and Health Manager, the Site Superintendent, and the Contracting Officer. Activity hazard analyses shall be attached to and become a part of the SSHP.

1.11 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

NOTE: Determine the need for specific qualified Safety and Health professionals. Because of unique health concerns at hazardous waste sites, projects will require a qualified Safety and Health Manager, SSHO, Occupational Physician, and at least two persons certified in first aid and CPR. A CIH will be required to serve as the Safety and Health Manager. For UST removals where the contaminants are known to be petroleum, oil or lubricants, a CSP may be utilized in lieu of a CIH as the Safety and Health Manager. Determine the type of experience required (hazardous waste, chemical industry, UST removal, etc.) based on the type of remedial action involved. The need for additional expertise (CSP, CHP) and/or safety and health technicians will be based on site specific factors and the type of remedial action to be implemented. If not required, delete safety and health technicians, certified health physicist or certified safety professional. Check Federal, state, and local requirements pertaining to specific qualifications and experience of personnel.

An organizational structure shall be developed that sets forth lines of authority (chain of command), responsibilities, and communication procedures concerning site safety, health, and emergency response.

This organizational structure shall cover management, supervisors and employees of the Contractor and subcontractors. The structure shall include the means for coordinating and controlling work activities of subcontractors and suppliers. The SSHP shall include a description of this organizational structure as well as qualifications and responsibilities of each of the following individuals. The Contractor shall obtain Contracting Officer's acceptance before replacing any member of the Safety and Health Staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

1.11.1 Site Superintendent

A Site Superintendent, who has responsibility to implement the SSHP, the authority to direct work performed under this contract and verify compliance, shall be designated.

1.11.2 Safety and Health Manager

1.11.2.1 Qualifications

The services of {an Industrial Hygienist certified by the American Board of Industrial Hygiene} or {a safety professional certified by the Board of Certified Safety Professionals} shall be utilized. The name, qualifications (education summary and documentation, ~~[ABIH]~~ [BCSP] certificate), and work experience summary shall be included in the SSHP. The Safety and Health Manager shall have the following additional qualifications:

- a. A minimum of {3} ~~{ }~~ years experience in developing and implementing safety and health programs {at hazardous waste sites} {in the hazardous waste disposal industry} or {in the chemical industry} ~~{in the petroleum processing industry}~~ ~~{at underground storage tank removal projects}~~.
- b. Documented experience in supervising professional and technician level personnel.
- c. Documented experience in developing worker exposure assessment programs and air monitoring programs and techniques.
- d. Documented experience in the development of personal protective equipment programs, including programs for working in and around potentially toxic, flammable and combustible atmospheres and confined spaces.
- e. Working knowledge of state and Federal occupational safety and health regulations.

1.11.2.2 Responsibilities

The Safety and Health Manager shall:

- a. Be responsible for the development, implementation, oversight, and enforcement of the SSHP.
- b. Sign and date the SSHP prior to submittal.
- c. Conduct initial site-specific training.
- d. Be present onsite during the ~~{first 3 days}~~ ~~{first}~~ week of remedial activities and at the startup of each new major phase.

- e. Visit the site as needed and at least ~~{once per week}~~ {once per month} {____} for the duration of activities, to audit the effectiveness of the SSHP.
- f. Be available for emergencies.
- g. Provide onsite consultation as needed to ensure the SSHP is fully implemented.
- h. Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the Contracting Officer.
- i. Provide continued support for upgrading/downgrading of the level of personal protection.
- j. Be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.
- k. Review accident reports and results of daily inspections.
- l. Serve as a member of the Contractor's quality control staff.

1.11.3 Site Safety and Health Officer (SSHO)

1.11.3.1 Qualifications

An individual and ~~{one alternate}~~ {____} ~~alternates~~ shall be designated the Site Safety and Health Officer (SSHO). The name, qualifications (education and training summary and documentation), and work experience of the Site Safety and Health Officer and ~~{alternate}~~ ~~alternates~~ shall be included in the SSHP. The SSHO shall have the following qualifications:

- a. A minimum of {2 years} ~~{1 year}~~ experience in implementing safety and health programs {at hazardous waste sites} ~~{in the hazardous waste disposal industry}~~ ~~{at underground storage tank removal projects}~~ ~~{in the chemical or petroleum processing industry}~~ where {Level B} ~~and~~ {Level C} personal protective equipment was required.
- b. Documented experience in construction techniques and construction safety procedures.
- c. Working knowledge of Federal and state occupational safety and health regulations.
- d. Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments, and air sampling methods.

1.11.3.2 Responsibilities

The Site Safety and Health Officer shall:

- a. Assist and represent the Safety and Health Manager in onsite training and the day to day onsite implementation and enforcement of the accepted SSHP.
- b. Be assigned to the site on a full time basis for the duration of field activities. The SSHO shall have no duties other than Safety and Health related duties. If operations are performed during more than one work shift per day, a site Safety and Health Officer shall be present for each shift.

- c. Have authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards, safe use of engineering controls, the emergency response plan, confined space entry procedures, spill containment program, and preparation of records by performing a daily safety and health inspection and documenting results on the Daily Safety Inspection Log.
- d. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.
- e. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Contracting Officer.
- f. Serve as a member of the Contractor's quality control staff on matters relating to safety and health.
- g. Conduct accident investigations and prepare accident reports.
- h. Review results of daily quality control inspections and document safety and health findings into the Daily Safety Inspection Log.
- i. In coordination with site management and the Safety and Health Manager, recommend corrective actions for identified deficiencies and oversee the corrective actions.

1.11.4 Occupational Physician ~~OMITTED~~

~~1.11.4.1 Qualifications~~

~~The services of a licensed physician, who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible, shall be utilized. The physician shall be familiar with this site's hazards and the scope of this project. The medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities shall be included in the SSHP.~~

~~1.11.4.2 Responsibilities~~

~~The physician shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1910, Section .120 (f) and 29 CFR 1926, Section .65 (f) and paragraph MEDICAL SURVEILLANCE.~~

1.11.5 Persons Certified in First Aid and CPR

At least two persons who are currently certified in first aid and CPR by the American Red Cross or other approved agency shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030. These persons may perform other duties but shall be immediately available to render first aid when needed.

1.11.6 Safety and Health Technicians

For each work crew in the exclusion zone, one person, designated as a Safety and Health technician, shall perform activities such as air monitoring, decontamination, and safety oversight on behalf of the SSHO. They shall have appropriate training equivalent to the SSHO in each specific area for which they have responsibility and shall report to and be under the supervision of the SSHO.

1.11.7 Certified Health Physicist (CHP) OMITTED

~~The services of a health physicist certified by the American Board of Health Physics shall be utilized. The CHP shall report to the Safety and Health Manager. The CHP shall be responsible for [].~~

1.11.8 Certified Safety Professional (CSP) OMITTED

~~The services of a safety professional certified by the Board of Certified Safety Professionals shall be utilized. The CSP shall report to the Safety and Health Manager. The CSP shall be responsible for [].~~

1.11.9 Professional Explosive Expert (TNT Pipeline) - CWM Property

The services of a certified professional Explosive Expert with at least 10 years of experience in preparing Explosive Operations Plans. The Explosives Expert will provide inspections of the equipment to be used to expose and excavate the pipeline and conduct safety briefings to review health and safety protocols and contingency measures related to explosive hazards.

The Explosive Expert shall also be responsible for developing procedures in the Explosive Operations Plan and conducting any handling, storage, transportation (to adjacent Army National Guard Property), treatment and disposal of crystalline material if encountered.

1.12 TRAINING

Personnel shall receive training in accordance with the Contractor's written safety and health training program and 29 CFR 1910 Section .120, 29 CFR 1926 Section .65, and 29 CFR 1926 Section .21. The SSHP shall include a section describing training requirements.

1.12.1 General Hazardous Waste Operations Training

Personnel entering the exclusion or contamination reduction zones shall have successfully completed 40 hours of hazardous waste instruction off the site; 3 days actual field experience under the direct supervision of a trained, experienced supervisor; and 8 hours refresher training annually. Onsite supervisors shall have completed the above training and 8 hours of additional, specialized training covering at least the following topics: the employer's safety and health program, personal protective equipment program, spill containment program, and health hazard monitoring procedures and techniques. Copies of current training certification statements shall be submitted prior to initial entry onto the work site.

1.12.2 Site-specific Training

Site-specific training sessions shall be documented in accordance with Section 01.B.03.b of EM 385-1-1.

1.12.2.1 Initial Session (Preentry Briefing)

Prior to commencement of onsite field activities, all site employees, including those assigned only to the Support Zone, shall attend a site-specific safety and health training session of at least [4] [] hours duration. This session shall be conducted by the Safety and Health Manager and the Site Safety and Health Officer to ensure that all personnel are familiar with requirements and responsibilities for maintaining a safe and healthful work environment. Procedures and contents of the accepted SSHP and Sections 01.B.02 and 28.D.03 of EM 385-1-1 shall be thoroughly discussed. The Contracting Officer shall be notified at least [5] [] days prior to the initial site-specific training session so government personnel involved in the project may attend.

All Contractor's personnel that are working on CWM property will be required to attend a 30-minute briefing offered by CWM Chemical Services, Inc. prior to conducting any field activities. The Contractor shall arrange for this briefing through the Contracting Officer.

1.12.2.2 Periodic Sessions

Periodic onsite training shall be conducted by the [SSHO] [Safety and Health Manager] at least [weekly] [daily] for personnel assigned to work at the site during the following [week] [day]. The training shall address safety and health procedures, work practices, any changes in the SSHP, activity hazard analyses, work tasks, or schedule; results of previous week's air monitoring, review of safety discrepancies and accidents.

Should an operational change affecting onsite field work be made, a meeting prior to implementation of the change shall be convened to explain safety and health procedures. Site-specific training sessions for new personnel, visitors, and suppliers shall be conducted by the SSHO using the training curriculum outlines developed by the Safety and Health Manager.

1.12.2.3 Other Training

~~NOTE: If site conditions warrant additional special training, specify requirements below.~~

~~For sites where employees will be required to work with radiation, determine and specify applicable training requirements (Federal and state).~~

{The Safety and Health Manager shall provide training as specified by 29 CFR 1910 Section .146, for employees who are required to supervise, standby, or enter permit-required confined spaces.} {Persons involved in any aspect of the transportation of hazardous materials shall be trained in accordance with 49 CFR 172 Subpart H.} { }.

1.13 PERSONAL PROTECTIVE EQUIPMENT

1.13.1 General

In accordance with 29 CFR 1910 Section .120 (g)(5) and 29 CFR 1926 Section .65 (g)(5), a written Personal Protective Equipment (PPE) program which addresses the elements listed in that regulation, and which complies with respiratory protection program requirements of 29 CFR 1910 Section .134, is to be included in the employer's Safety and Health Program. The Site Safety and Health Plan shall

detail the minimum PPE ensembles (including respirators) and specific materials from which the PPE components are constructed for each site-specific task and operation to be performed, based upon the hazard/risk analysis. Components of levels of protection (B, C, D and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators approved by NIOSH shall be used. Onsite personnel shall be provided with appropriate personal protective equipment. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the SSHP shall include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

1.13.2 Levels of Protection

The Safety and Health Manager shall establish appropriate levels of protection for each work activity based on review of historical site information, existing data, an evaluation of the potential for exposure (inhalation, dermal, ingestion, and injection) during each task, past air monitoring results, and a continuing safety and health monitoring program. The Safety and Health Manager shall also establish action levels for upgrade or downgrade in levels of PPE from the following specified minimum levels of protection. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE reassessment protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

1.13.2.1 Components of Levels of Protection

NOTE: Specify all components of each minimum initial level of protection that will be required for this site. Delete non applicable items and add others that are necessary for the project. For guidance in determining appropriate components for levels of protection, utilize the following references:

NIOSH, OSHA, USCG, EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, October 1985, NIOSH 85-115; EM 385-1-1, Section 5 and Appendix L; 29 CFR 1910 Section .120, Appendix B; and 29 CFR 1926 Section .65, Appendix B.

Components must be included that provide protection for the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing. Specify the types of materials (e.g., neoprene, nitrile, etc.) for gloves and boots and types of cartridges for air purifying respirators based on site specific contaminants. Include types and thicknesses of radiation shielding, if applicable.

The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:

Level D

- a. Head - Hard hat.
- b. Eye and Face - Safety glasses.
- c. Hearing - Near Heavy Equipment.
- d. Appropriate Work Uniform - Cotton or Tyvek coveralls.
- e. Hand - Gloves - Nitrile (surgical) gloves with Viton outer gloves or leather work gloves.
- f. Foot - Safety Boots - Steel toe/shank chemical resistant boots or safety work shoes with chemical resistant disposable overboots.

Modified Level D

- a. Head - Hard hat.
- b. Eye and Face - Safety glasses or goggles and splash shield.
- c. Hearing - Near Heavy Equipment.
- d. Whole Body - Saranex coveralls.
- e. Hand - Gloves.
 - e.1. Gloves - Nitrile surgical inner gloves.
 - e.2. Gloves - Viton outer gloves.
- f. Foot - Safety Boots
 - f.1. Boots - Steel toe/shank chemical resistant boots or safety shoes.
 - f.2. Boots - Chemical resistant disposable overboots.

Level C

- a. Head - Hard hat.
- b. Eye and face.
- c. Hearing - Near heavy equipment.
- d. Whole Body - Cotton coveralls; Saranex coveralls with hoods.
- e. Hand - Gloves
 - e.1. Gloves - Nitrile surgical inner gloves.
 - e.2. Gloves - Combination of Viton over silver shield outer gloves, or leather outer work gloves.

f. Foot - Boots.

f.1. Boots - Steel toe/shank chemical resistant boots or safety shoes.

f.2. Boots - Chemical resistant overboots.

g. Full Face.

h. Cart./Canister

Level B

a. Head - Hard hat.

b. Eye and Face - Positive-pressure, self-contained breathing apparatus (SCBA) (NIOSH approved).

c. Hearing.

d. Whole body - Same as for Level C.

e. Hand - Gloves.

e.1. Gloves - Nitrile surgical inner gloves.

e.2. Gloves - Combination of Viton over silver shield outer gloves.

f. Foot - Boots.

f.1. Boots - Same as for Level C.

f.2. Boots - Same as for Level C.

g. Comb. Airline/SCBA.

1.13.2.2 Initial Minimum Levels of PPE by Task

NOTE: List each anticipated major task and
operation and specify the initial minimum level of
PPE required. The list of site tasks and operations
developed for paragraph Site Tasks and Operations
(Workplan) will be used. Determination of these
levels will be justified by the decision logic
contained in the Health and Safety Design Analysis
for the project.

Based on available information, the initial minimum protective equipment requirements for each major task and operation are listed below. Available site information shall be reviewed and the list of tasks and operations and these levels of protection shall be expanded and/or revised during preparation of the SSHP. These levels of protection represent initial PPE. Actual level of protection shall be based

on monitoring and action levels and responses outlined in the SSHP. Table 01110-2 provides suggested actions:

TASK/OPERATION	INITIAL LEVEL OF PROTECTION
● Chemical Waste Sewer Systems - CMW and Somerset Property	
a. Mobilization.	D
b. Removal of liquids from sewer.*	B
c. Removal of sludges and cleaning of lift stations.*	B
d. Flushing of sewer.*	B
e. Liquids handling and storage.	B, C, or D
f. Solids handling and containerized.	D, B
g. Disposal.	D, B
h. Site restorations.	D
i. Potential Confined Space Environment	
● TNT Pipeline - CWM and Town of Lewiston Properties	
a. Mobilization (staging area, stockpile areas, E & S controls, etc)	D
b. Establishment of sumps and accessing pipeline.	C
c. Removal of pipeline liquids.	D mod.
d. Removal of designated sections of pipeline.	D mod.
e. Flushing of designated section of pipeline.	D mod.
f. Confirmation sampling.	D mod.
g. Handling of sediments (removal, dewatering, storage and containerization).	D mod.
h. Dewatering and liquids handling.	D mod.
i. Handling of removed pipe material.	D mod.
j. Disposal.	D mod.
jk. Backfill and grading.	D
kl. Site restoration.	D

1.13.3 PPE for Government Personnel

 NOTE: Confer with the Construction Division or
 Resident or Area Engineer in the Construction
 oversight District to determine the appropriate
 number of sets of PPE required.

{Three}-{ } clean sets of personal protective equipment and clothing (excluding air-purifying negative-pressure respirators and safety shoes, which will be provided by individual visitors), as required for entry into the Exclusion Zone and/or Contamination Reduction Zone, shall be available for use by the Contracting Officer or official visitors. The items shall be cleaned and maintained by the Contractor and stored [in the cleanroom of the decontamination facility] [] and clearly marked: "FOR USE BY GOVERNMENT ONLY." The Contractor shall provide basic training in the use and limitations of the PPE provided, and institute administrative controls to check prerequisites prior to issuance. Such prerequisites include meeting minimum training requirements for the work tasks to be performed and medical clearance for site hazards and respirator use.

1.14 MEDICAL SURVEILLANCE

The Safety and Health Manager, ~~in conjunction with the Occupational Physician,~~ shall detail, in the employer's Safety and Health Program and the SSHP, the medical surveillance program that includes scheduling of examinations, certification of fitness for duty, compliance with OSHA requirements, and information provided to the ~~Contractor's physician who performs the medical monitoring.~~ Examinations shall be performed by or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place. Medical surveillance protocols and examination and test results shall be reviewed by the Occupational Physician. The medical surveillance program shall contain the requirements specified below. Personnel working in contaminated areas of the site shall have been examined as prescribed in 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65, and determined medically fit to perform their duties.

1.14.1 Frequency of Examinations

Employees shall have been provided with medical examinations as specified, within the past 12 months and shall receive exams annually thereafter (if contract duration exceeds 1 year); on termination of employment; reassignment in accordance with 29 CFR 1910 \&Section .120 (f)(3)(i), and 29 CFR 1926 Section .65 (f)(3)(i)(C);&\ if the employee develops signs or symptoms of illness related to workplace exposures; if the physician determines examinations need to be conducted more often than once a year; and when an employee develops a lost time injury or illness during the period of this contract. The supervisor shall be provided with a written statement signed by the physician prior to allowing the employee to return to the work site after injury or illness resulting in a lost workday, as defined in 29 CFR 1904 Section .12 (f).

1.14.2 Content of Examinations

NOTE: In consultation with an occupational physician, determine the need for special medical tests, delete any that do not apply, such as urine heavy metals, serum lead and zinc protoporphyrin, and add others as necessary for the project, based on site specific contaminants.

The following elements shall be included in the medical surveillance program. Additional elements may be included at the discretion of the occupational physician responsible for reviewing the medical surveillance protocols.

- a. Complete medical and occupational history (initial exam only).
- b. General physical examination of major organ systems.
- c. Pulmonary function testing including FVC and FEV1.0.
- d. CBC with differential.
- e. Blood chemistry screening profile (e.g. SMAC 20/25).
- f. Urinalysis with microscopic examination.
- g. Audiometric testing (as required by Hearing Conservation Program).
- h. Visual acuity.
- i. Chest x-ray. (This test should be performed no more frequently than every 4 years, unless directed by Occupational Physician.)
- j. ~~Electrocardiogram (as directed by Occupational Physician).~~
- k. Urine heavy metals (arsenic, cadmium, chromium, and mercury).
- l. Serum lead.
- m. ~~zinc protoporphyrin.~~

1.14.3 ~~Information Provided to the Occupational Physician~~

~~The physician shall be furnished with the following:~~

- a. ~~Site information from paragraph, SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION.~~
- b. ~~information on the employee's anticipated or measured exposure.~~
- c. ~~a description of any PPE used or to be used.~~
- d. ~~A description of the employee's duties as they relate to the employee's exposures (including physical demands on the employee and heat/cold stress).~~
- e. ~~A copy of 29 CFR 1910 Section .120, or 29 CFR 1926 Section .65.~~
- f. ~~Information from previous examinations not readily available to the examining physician.~~
- g. ~~A copy of Section 5.0 of NIOSH Pub No. 85-115.~~
- h. ~~Information required by 29 CFR 1910 Section .134.~~

1.14.4 Physician's Written Opinion

Before work begins a copy of the physician's written opinion for each employee shall be obtained and furnished to the Safety and Health Manager; and the employee. The opinion shall address the employee's ability to perform hazardous remediation work and shall contain the following:

- a. The physician's recommended limitations upon the employee's assigned work and/or PPE usage.
- b. The physician's opinion about increased risk to the employee's health resulting from work; and
- c. A statement that the employee has been informed and advised about the results of the examination.

1.14.5 Medical Records

Documentation of medical exams shall be provided as part of the Certificate of Worker or Visitor Acknowledgment. Medical records shall be maintained in accordance with 29 CFR 1910 Section .120, and 29 CFR 1926 Section .65.

1.15 RADIATION DOSIMETRY

~~NOTE: For sites where ionizing radiation or
radioactive materials may be encountered, edit and
include this paragraph.~~

A radiation protection and dosimetry program shall be described in the SSHP and implemented. Employees working within a radiologically restricted area shall receive appropriate dosimetry monitoring for radiation exposure as specified in 192.3

1.15.1 Evaluation

Radiation dosimetry shall be evaluated by an individual or company holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP). Electronic dosimetry may be used to assign external dose if approved by the Contracting Officer.

1.15.2 Documentation

Employee exposure to external radiation shall be documented. This shall include reviewing each employee's radiation exposure history in accordance with 10 CFR 20 Section .2104, for compliance with exposure standards prior to allowing the employee access to a restricted area. If the employee has no exposure history, the employee shall provide a signed written statement to that effect.

1.15.3 Bioassay

When the possibility of internal radioactive contamination exists, a bioassay program shall be implemented to determine internal exposure. The bioassay program shall provide sampling of employee nasal passages, urine and/or feces, or whole body counting, as appropriate to evaluate the suspected radionuclides.

1.15.4 Reporting

Reports of exposure to ionizing radiation shall be furnished to the Contracting Officer as soon as available and to each employee annually, upon termination, and within 30 days of any personal request.

1.16 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

~~NOTE: Specify details for the exposure monitoring and air sampling program. Include details about the following, as they pertain to exposure monitoring/air sampling: why (purpose), where (location), when (frequency and duration), what (parameters), and how (methods, instruments and equipment). If ambient air sampling using EPA methods is required at the site boundaries, requirements are to be specified in a chemical data quality management section.~~

~~Specify where monitoring/sampling is to be performed. Include monitoring/sampling of employee(s) with the greatest potential for exposure (high risk employees) in all work zones (exclusion, contamination reduction and support), in confined spaces, and monitoring/sampling at the site boundary (only for the purpose of controlling onsite operations - sampling for documentation of off site air quality is to be addressed in the Chemical Quality Management section).~~

~~Specify monitoring frequencies and durations for the following: baseline or background, when work begins on a different portion of the site, when new operations begin, when different contaminants are being handled, when handling leaking drums or containers or working in areas with obvious liquid contamination, and when entering or working in confined spaces.~~

~~Specify minimum parameters to be monitored/sampled. Include specific chemical and physical parameters. The following are to be included as appropriate, depending on site specific conditions: classes of chemicals (i.e., organic vapors if using survey instruments), specific chemicals for individual identification and analysis, oxygen content, flammable atmospheres, total and respirable dust, specific types of radiation, noise, meteorological data, etc. \&Include any applicable exposure monitoring requirements contained in OSHA's substance specific standards.&\~~

~~Specify methods, instrument, and equipment for both direct reading (real time) monitoring and integrated (time weighted average) sampling. Direct reading instruments may include the following, as appropriate: instruments for specific chemicals (colorimetric tubes, direct reading badges, hazardous gas monitors, oxygen meters, gas chromatographs); survey type instruments for gases or vapors (PID, FID, IR), total and respirable dust, radiation, flammable gases or vapors, noise, etc. Integrated sampling equipment may include the following, as appropriate: pumps, collection media, badge type passive samplers, etc. Some methods may require specific types of sampling equipment. Specify the use of NIOSH methods (from NIOSH Publication Number 84 100, NIOSH Manual of Analytical Methods) for personal exposure sampling. Samples collected using NIOSH methods are to be analyzed only by laboratories currently accredited by the American Industrial Hygiene Association (AIHA). Address procedures and recordkeeping requirements for calibration and maintenance of instruments and equipment. Do not specify brand names for instruments or equipment.~~

~~Specify requirements for evaluation of results and implementation of appropriate actions based upon action levels established by the hazard/risk analysis. Include a paragraph for requirements for reporting and documentation. Documentation is to include the following information: date, type of equipment utilized, equipment I.D. number, monitoring results for each work location or monitoring station with time of readings, analytical results for personal exposure sampling, personnel or location monitored/sampled with description of activity being performed, sample numbers, weather conditions (wind direction, precipitation, temperature, etc.), and miscellaneous information related to monitoring/sampling performed.~~

~~*****~~

The Safety and Health Manager shall prepare and implement an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel. Minimum initial requirements for the program are delineated below. Available site information shall be reviewed and the exposure monitoring/air sampling program shall be expanded and/or revised for submittal as part of the SSHP.

~~[]~~ Table 01110-2 provides the minimum required monitoring instruments and suggested action levels and responses for the anticipated contaminant hazards on a site-wide basis. The contractor shall review the area specific chemical data provided in the specifications reference under Paragraph 1.8 to

determine the contaminant hazards specific to the area the work is being performed, depending on the scope of the contract. Presented in Table 01110-3 are the specific areas to be remediated and the anticipated contaminant hazard. Table 01110-3 shall then be used with the required monitoring instruments and supplied action levels in Table 01110-2 to develop the Contractor's task specific monitoring program.

1.17 HEAT AND COLD STRESS MONITORING

The Safety and Health Manager shall develop a heat stress and cold stress monitoring program for onsite activities. Details of the monitoring program, including schedules for work and rest, and physiological monitoring requirements, shall be described in the SSHP. Personnel shall be trained to recognize the symptoms of heat and cold stress. The SSHO and an alternate person shall be designated, in writing, to be responsible for the heat and cold stress monitoring program.

1.17.1 Heat Stress

Physiological monitoring shall commence when the ambient temperature is above 21.1 degrees C. (70 degrees F.) Monitoring frequency shall increase as the ambient temperature increases or as slow recovery rates are observed. An adequate supply of cool drinking water shall be provided for the workers. NIOSH Pub No. 85-115 may be consulted for guidance in determining protocols for prevention of heat stress.

1.17.2 Cold Stress

To guard against cold injury, appropriate clothing and warm shelter for rest periods shall be provided. Procedures to monitor and avoid cold stress shall be followed in accordance with the current TLVs for Cold Stress as recommended in ACGIH-02.

1.18 SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

~~NOTE: Any special precautions necessary due to the nature of the work shall be described under these headings. Delete the paragraphs that relate only to tank removal when not required.~~

The SSHP shall describe the standard operating safety procedures, engineering controls and safe work practices to be implemented for the work covered. These shall include, but not be limited to, the following:

1.18.1 General Site Rules/Prohibitions

General site rules/prohibitions (buddy system, eating, drinking, and smoking restrictions, etc.): ☐.

1.18.2 Work Permit Requirements

Radioactive work, excavation, hot work, confined space, etc.: ☐.

1.18.3 Material Handling Procedures

Soils, liquids, radioactive hazardous materials: ☐.

1.18.3.1 Spill and Discharge Control

NOTE: If requirements for spill and discharge control are described in a separate section, reference the appropriate section. Determine local notification requirements and include them in the following paragraph.

Written spill and discharge containment/control procedures shall be developed and implemented. These procedures shall address hazardous wastes, potentially hazardous materials/liquids entering excavations, radioactive wastes, shock sensitive wastes, laboratory waste packs, material handling equipment, and appropriate procedures for tank and vault entry as well as drum and container handling, opening, sampling, shipping and transport. These procedures shall describe prevention measures, such as building berms or dikes; spill control measures and material to be used (e.g., booms, vermiculite); location of the spill control material; personal protective equipment required to clean up spills; disposal of contaminated material; and who is responsible to report the spill. Storage of contaminated material or hazardous materials shall be appropriately bermed, diked and/or contained to prevent any spillage of material on uncontaminated soil. If the spill or discharge is reportable, and/or human health or the environment are threatened, the National Response Center, the state, and the Contracting Officer shall be notified as soon as possible. Reporting requirements shall be in accordance with [Section 02071 UNDERGROUND STORAGE TANK REMOVAL] []. In the event that a potentially hazardous spill occurs on CWM property, site personnel should immediately move away from the affected area(s) and notify the Contracting Officer, CWM, and other site personnel. Work will not resume in the affected area(s) until the hazard is properly addressed and/or cleaned by authorized/capable personnel. CWM contacts for spill reporting are as follows:

•	Jill Knickerbocker	754-0246
•	Donna Ames-Cassick	754-0354
•	Greg Zayatz	754-0233

Spills on other properties of the LOOW site shall be brought to the immediate attention of the Contracting Officer.

1.18.3.2 Materials Transfer Safety

Liquids and residues shall be removed from the tanks using explosion-proof or air-driven pumps. Pump motors and suction hoses shall be bonded to the tank and grounded to prevent electrostatic ignition hazards. Use of a hand pump will be permitted to remove the last of the liquid from the bottom of the tanks. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck shall be vapor free. The truck shall be located upwind from the tank and outside the path of probable vapor travel. The vacuum pump exhaust gases shall be discharged through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices shall conform to API Publ 2219. Tank residues shall be collected in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and disposed of as specified. After the materials have been transferred and the tanks have been exposed, fittings and lines leading to the tanks shall be disconnected and drained of their contents. The contents of the lines shall not spill to the environment during cutting or disconnecting of tank fittings. Materials drained shall be transferred into DOT-approved drums for storage and/or transportation. Only non-sparking or non-heat producing tools shall be used to disconnect and drain or to cut through tank fittings. Electrical equipment (e.g., pumps, portable hand

tools, etc.) used for tank preparation shall be explosion-proof. Following cutting or disconnecting of the fittings, openings leading to the tanks shall be plugged.

1.18.4 Drum and Container Handling

Procedures and Precautions (opening, sampling, overpacking): .

1.18.5 Confined Space Entry Procedures

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1.18.6 Hot Work

Hot work shall not be permitted on or within the tanks except as outlined herein. Prior to conducting hot work, a hot work permit shall be prepared and submitted. An example format for a hot work permit shall be included in the SSHP. The permit shall describe compliance with the following procedures. After tank interiors have been decontaminated, hot work may be conducted only when the tank is inerted, and to the extent necessary to begin dismantling the tanks. After decontamination of tank interiors, hot work shall not be performed unless monitoring indicates atmospheres within and immediately surrounding the tanks are less than 8% oxygen inside the tank and less than 10% of the LFL outside the tank; continuous monitoring shall continue until the hot work is completed. The hot work prohibition includes welding, cutting, grinding, sawing, or other similar operations which could be expected to potentially generate combustion-producing temperatures or sparks, or which could produce potentially hazardous fumes or vapors. An individual at each hot work site shall be designated as a fire watch. This person's sole responsibility shall be to monitor the hot work and have immediate access to the fire extinguisher located at each hot work site. A new permit shall be obtained at the start of each work shift during which hot work will be conducted.

1.18.7 Ignition Sources

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1.18.8 Fire Protection and Prevention

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1.18.9 Electrical Safety

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1.18.10 Excavation and Trench Safety

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1.18.11 Guarding of Machinery and Equipment

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1.18.12 Lockout/Tagout

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1.18.13 Fall Protection

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1.18.14 Hazard Communication

[].

1.18.15 Illumination

[].

1.18.16 Sanitation

[].

1.18.17 Engineering Controls

[].

1.18.18 Process Safety Management

[].

1.18.19 Signs and Labels

[].

1.18.20 Waste Disposal

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1.18.21 Tank Purging for Permit-Required Confined Space Entries

Tanks shall be purged for confined space entry. The flammable vapors shall be reduced to less than 10% of the LFL and the oxygen content shall be between 19.5% and 23.5%. Confined space entry into the tanks shall not be attempted unless absolutely necessary, as for example, to remove sludge from the tank. Flammable vapors may be exhausted from the tank by any of the methods from API RP 1604 listed below, or any method approved by the Contracting Officer. The SSHP shall specify the purging method to be used.

- a. Ventilation by Eductor-Type Air Movers: The eductor-type air mover shall be properly bonded and grounded to prevent the generation and discharge of static electricity. When using this method, the fill (drop) tube shall remain in place to ensure ventilation at the bottom of the tank. Tanks equipped with fill (drop) tubes that are not removable shall be purged by this method. An eductor extension shall be used to discharge vapors a minimum of 3.7 meters (12 feet) above grade or 1 meter (3 feet) above adjacent roof lines, whichever is greater. If this is not possible, alternative methods shall be proposed and approved prior to purging. Noise levels generated by these devices as a result of high airflow may exceed OSHA PELs. Noise levels shall be evaluated and appropriate hearing protection shall be provided.

- b. **Ventilation by Diffused Air Blowers:** When using this purging method, the air-diffusing pipe is properly bonded and grounded to prevent the discharge of a spark. Fill (drop) tubes shall be removed to allow proper diffusion of the air in the tank. Air supply shall be from a compressor that has been checked to ensure that Grade D breathing air is being supplied. Air pressure in the tank must not exceed 34 kPa (5 psi) ((5 psi)) 5 pounds per square inch gauge to avoid tank failure.
- c. **Commercial Emulsifiers and Volatile Fuel Encapsulators:** These products are completely miscible in water, aid in the elimination of flammable vapors, and are biodegradable. Regulatory requirements for treatment and disposal of the water shall be determined prior to using this method. Standing outside the tank, the operator shall rinse the tank with a 3- to 6-percent solution of the product using a pressure sprayer through a tank opening. Explosive concentrations shall be measured at several levels (top, middle, and bottom) within the tank. If readings are greater than 10% of the LFL, the tank shall be rinsed again. When LFL readings are acceptable, the water in the tank shall be pumped out for disposal.

1.18.22 Tank Inerting (No Entry)

Following the removal of tank contents but prior to excavation of the tanks and tank preparation activities, the tanks shall be inerted only by introducing an inert gas, carbon dioxide (CO₂) or liquid nitrogen (N₂), to remove flammable vapors. Before inerting, all openings in the tanks shall be plugged with threaded or expansion type plugs except the vent tube and the opening to be used for introducing the inert gas. Within 30 minutes prior to initiating any activities (e.g., excavating, preparation, removal, opening, demolition, transportation, or other similar activities) involving a tank which has been inerted, the inerted nature of the tank (oxygen levels less than 8%) shall be verified.

- a. CO₂ fire extinguishers shall not be used for inerting the tank interiors. If a compressed gas (e.g., CO₂ or N₂) is introduced into the tank the following requirements shall be met to prevent the buildup of static electricity:
 - (1) The UST and the compressed gas supply tank shall be bonded together and grounded.
 - (2) The compressed gas shall be supplied only at low flows.
 - (3) The liquid or gas shall be released at the tank bottom so that static electricity is not generated by liquid falling to the bottom of the tank. The tank shall be slowly filled from the bottom up.
- b. Dry ice, which evolves CO₂ gas as it evaporates, if used, shall be introduced in the amount of at least 10 kg per 400 L (3 pounds per 100 gal) (3 pounds per 100 gallons) of tank capacity. Skin contact with dry ice shall be prevented by wearing heavy cloth gloves.
- c. Sufficient quantities of inert gas (CO₂ or N₂) shall be introduced into the tanks to lower the oxygen content to less than 8%. Pressure inside the tank shall not exceed 34 kPa (5 psi). (5 psi.) Prior to proceeding with additional activities on the tank (e.g., excavating), the oxygen content of the tanks shall be monitored to confirm that it is less than 8%. Additional oxygen level monitoring shall be conducted at least hourly while activities involving the tanks are underway but prior to decontamination of tank interiors; at least daily during periods in which the tanks are not being disturbed but prior to decontamination of their interiors; or as directed by the Contracting Officer. If monitoring of tank interiors indicates that oxygen levels are not remaining below 8%, additional inert gas shall be introduced and more frequent oxygen monitoring shall be initiated.

- d. During inerting procedures, an extension vent tube a minimum of 3.7 meters (12 feet) above grade or 1 meter (3 feet) above any adjacent (within 22.5 meters (75 feet)) roof lines, whichever is greater shall be used to discharge tank vapors. If this is not possible, alternative methods shall be proposed and approved prior to inerting. Continuous combustible gas/oxygen monitoring shall be conducted at the vent and inert gas introduction holes.

1.18.23 Tank Atmosphere Testing

The air within the storage tanks shall be monitored to ensure the space is either adequately purged and safe for personnel entry, or to ensure the tank has been adequately inerted and the oxygen content is less than 8%. In both instances, monitoring shall be performed at the top, bottom, and middle areas of the tanks to ensure stratification has not occurred. Monitoring results shall be reported to project personnel to ensure safe operations. Data shall be recorded as specified in paragraph EXPOSURE MONITORING/AIR SAMPLING PROGRAM.

1.18.23.1 Monitoring To Ensure Purging

When monitoring to ensure purging, both oxygen content and LFL readings are required. Prior to obtaining LFL readings, the Contractor shall monitor the oxygen content of the space and verify that the combustible gas indicators are operating within the oxygen limits identified by the CGI manufacturer. Personnel shall not be permitted to enter spaces with oxygen levels less than 19.5 percent, except in emergencies, and then only when equipped with the proper PPE and when following permit-required confined space entry procedures. Toxic air contaminants shall be monitored as specified in paragraph EXPOSURE MONITORING/AIR SAMPLING PROGRAM.

1.18.23.2 Monitoring To Ensure Inerting

Inerted tanks shall be monitored to ensure oxygen readings remain below a maximum allowable percentage of 8% by volume.

1.18.24 Tank Lifting

Tanks shall be lifted using equipment with a rated capacity greater than the load to be lifted. Tanks shall be lifted by lifting eyes or by straps under the ends of the tanks. Tanks shall not be lifted by the manhole flange or by removing the bungs. Personnel shall be directed to remain away from the ends of the tanks and tanks shall be positioned, whenever possible, with the ends oriented away from occupied or traveled areas, due to potential for rupture. During transportation, the tanks shall be secured to prevent movement.

1.18.25 ~~Tank Demolition~~

~~The tanks excavated as part of this project shall be demolished before being removed from the site unless they are transported directly to a state certified tank destruction facility. Demolition shall not be permitted until a decontamination of the interiors and exteriors is complete. Demolition shall involve opening the tanks sufficiently to permanently prohibit further use as containers of liquids. Tanks shall be inerted and tested before they are opened. Plans and procedures, including a list of materials and supplies, for safely and effectively demolishing the tanks shall be submitted in the SSHP.~~

1.18.26 ~~Tank Cleaning~~

~~Safety practices and procedures for the cleaning of the storage tanks shall conform to API Std 2015. Opening of the tanks to permit decontamination shall be conducted utilizing only methods approved in~~

~~the SSHP. The interior and exterior of the tank shall be decontaminated prior to removing it from the work site unless the tank is being transported directly to a state certified tank destruction facility. Plans and procedures, including materials and supplies, for safely and effectively opening the tanks, cleaning surfaces of the interior and exterior of the tanks, and disposing of the decontamination fluids shall be submitted in the SSHP. Volatile organic solvents shall not be permitted to be utilized for decontamination procedures. Personnel shall not enter any of the storage tanks as a part of this project, except when following permit required confined space entry procedures. Decontamination fluids shall be collected and disposed. Upon completion of this project, written certification shall be made that the tank was properly decontaminated prior to being removed from the site.~~

1.19 SITE CONTROL MEASURES

In order to prevent the spread of contamination and control the flow of personnel, vehicles, and materials into and out of work areas, site control measures shall be established and described in the SSHP. The SSHP shall describe the methodology to be used by the Safety and Health Manager and SSHO in determining work zone designations and their modifications, and procedures to limit the spread of contamination. The SSHP shall include procedures for the implementation and enforcement of safety and health rules for all persons on the site, including employers, employees, outside Contractors, government representatives, and visitors.

1.19.1 Work Zones

~~NOTE: Utilize the contamination characterization information and the preliminary hazard/risk analysis to delineate work zone boundaries on the drawings. Include a note on the drawings that these are only initial anticipated work zone boundaries and they must be modified by the Contractor to show the actual zones.~~

~~On sites where ionizing radiation or radioactive material may be encountered, specify that the Contractor shall designate restricted areas (Radiation Areas, High Radiation Areas and Airborne Radioactive Contamination Areas as defined in 10 CFR 20).~~

Initial anticipated work zone boundaries are shown on the drawings. Utilizing this guidance, work zone boundaries (exclusion zone, including restricted and regulated areas; contamination reduction zone; and support zone) and access points shall be established and the boundary delineations shall be included on the drawings and in the SSHP. Delineation of work zone boundaries shall be based on the contamination characterization data and the hazard/risk analysis to be performed as described in paragraph: HAZARD/RISK ANALYSIS. As work progresses and field conditions are monitored, work zone boundaries may be modified with approval of the Contracting Officer. Work zones shall be clearly identified and marked in the field (using fences, tape, signs, etc.). A site map, showing work zone boundaries and locations of decontamination facilities, shall be posted in the onsite office. Work zones shall consist of the following:

- a. Exclusion Zone (EZ): The exclusion zone is the area where hazardous contamination is either known or expected to occur and the greatest potential for exposure exists. Entry into this area shall be controlled and exit may only be made through the CRZ.
- b. Contamination Reduction Zone (CRZ): The CRZ is the transition area between the Exclusion Zone and the Support Zone. The personnel and equipment decontamination areas shall be separate and unique areas located in the CRZ.
- c. Support Zone (SZ): The Support Zone is defined as areas of the site, other than exclusion zones and contamination reduction zones, where workers do not have the potential to be exposed to hazardous substances or dangerous conditions resulting from hazardous waste operations. The Support Zone shall be secured against active or passive contamination. Site offices, parking areas, and other support facilities shall be located in the Support Zone.

1.19.2 Site Control Log

A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable), and personal protective equipment utilized. Before visitors are allowed to enter the Contamination Reduction Zone or Exclusion Zone, they shall show proof of current training, medical surveillance and respirator fit testing (if respirators are required for the tasks to be performed) and shall fill out the Certificate of Worker or Visitor Acknowledgment. This visitor information, including date, shall be recorded in the log.

1.19.3 Communication

 NOTE: Specify the appropriate communication systems
 (i.e., air horns, walkie talkies, radios,
 telephones, etc.) based on site specific conditions.

An employee alarm system that has adequate means of on and off site communication shall be provided and installed in accordance with 29 CFR 1910 Section .165. The means of communication shall be able to be perceived above ambient noise or light levels by employees in the affected portions of the workplace. The signals shall be distinctive and recognizable as messages to evacuate or to perform critical operations. ~~This includes: [] This communication shall be coordinated with CWM when working on CWM property. All emergency and contingency measures shall be coordinated with the property owner.~~

1.19.4 Site Security

 NOTE: Specify the appropriate type of site security
 (i.e., warning signs, fences, 24 hour security
 guard, site access procedures, etc.) based on
 site specific conditions.
 On sites where ionizing radiation or radioactive
 material may be encountered, specify that signs
 shall meet requirements of 10 CFR 20.

The following site security shall be provided: ☐ Site security shall be coordinated with the property owner. Signs shall be printed in bold large letters on contrasting backgrounds in English or where appropriate in the predominant language of workers unable to read English. Signs shall be visible from all points where entry might occur and at such distances from the restricted area that employees may read the signs and take necessary protective steps before entering.

1.20 PERSONAL HYGIENE AND DECONTAMINATION

Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the following personal hygiene and decontamination provisions. Decontamination shall be performed in the CRZ prior to entering the Support Zone from the Exclusion Zone. Chapter 10.0 of NIOSH Pub No. 85-115 shall be consulted when preparing decontamination procedures. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the SSHP. Employees shall be trained in the procedures and the procedures shall be enforced throughout site operations. Persons disregarding these provisions of the SSHP shall be barred from the site.

1.20.1 Decontamination Facilities

~~NOTE: Based on the onsite contamination and the~~
~~type and duration of remedial activities, determine~~
~~the necessary facilities and their locations and~~
~~edit this paragraph accordingly. Shower facilities~~
~~shall be provided for all projects with severe skin~~
~~absorbents, with an anticipated duration of greater~~
~~than six months, or as required by specific hazards.~~

The following facilities shall be provided:

A personnel decontamination facility in the CRZ. This facility shall be used by both Contractor personnel and government representatives. The decontamination facility shall provide for separation of street clothing and contaminated PPE and shall be equipped with heating, lighting, ventilation, a change room and lockers, hot and cold water, shower facilities with hot and cold water, towels, soap in sufficient quantities for all anticipated personnel, and waste water storage facilities for controlling the disposal of used water. Laundry facilities or provisions of laundry service. If an off-site laundry service is used, they shall be notified, in writing, of the possibility and nature of contaminants expected on clothing. ☐.

1.20.2 Procedures

~~NOTE: Specify necessary procedures. Include any~~
~~special procedures such as disposal of used PPE and~~
~~decontamination water.~~

Minimum decontamination procedures are listed below. Available site information shall be reviewed and these procedures shall be expanded and/or revised for submittal as part of the SSHP. ☐.

1.21 EQUIPMENT DECONTAMINATION

Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site. The procedures for decontamination of vehicles and equipment shall be addressed in the SSHP.

1.21.1 Decontamination Facilities

NOTE: Other sections of the specifications and drawings should contain detailed requirements for the vehicle or equipment decontamination pad. As an alternative, the design of the decontamination pad may be a Contractor submittal. The language in this paragraph provides general requirements for the Contractor's submittal. Edit as necessary for project.

A [vehicle]/[equipment] decontamination station shall be provided within the CRZ for decontaminating vehicles and equipment leaving the EZ. The decontamination station [shall be as shown on the drawings] and [shall include the following: A traffic surface consisting of ~~a concrete pad of sufficient strength to support traffic without cracking.~~] [a minimum of 12 inches of crushed rock. The crushed rock shall be underlaid by a chemically resistant impermeable flexible membrane, such as HDPE, PVC or VLDPE with a minimum thickness of {1} [] mm. ([40] [] mils.) The liner shall be protected from damage on top with a geotextile. The base layer of soil on which the membrane is placed shall be free of objects greater than [0.375] [] inches in diameter and any other materials which could puncture or damage the membrane.] The pad shall be constructed to capture decontamination water, including overspray, and shall allow for collection and removal of the decontamination water using sumps, dikes and ditches as required.] [High pressure, low volume, water wash area for equipment and vehicles.] [A steam cleaning system for use after the mud and/or site material has been cleaned from the equipment.] [A designated "clean area" in the CRZ for performing equipment maintenance. This area shall be used when personnel are required by normal practices to come in contact with the ground, i.e., crawling under a vehicle to change engine oil. Equipment within the EZ or CRZ shall be decontaminated before maintenance is performed.] [].

1.21.2 Procedures

NOTE: Specify necessary procedures. Include any special procedures and methods to determine adequacy of decontamination.

Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and off-site areas. These procedures shall address disposal of contaminated products and spent materials used on the site, including containers, fluids, oils, etc. Any item taken into the EZ shall be assumed to be contaminated and shall be inspected and/or decontaminated before the item leaves the area. Vehicles, equipment, and materials shall be cleaned and decontaminated prior to leaving the site. Construction material shall be handled in such a way as to minimize the potential for contaminants being spread and/or carried offsite. Prior to exiting the site, vehicles and equipment shall be monitored to ensure the adequacy of decontamination.

1.22 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

The SSHP shall describe the emergency and first aid equipment to be available onsite. The following items, as a minimum, shall be maintained onsite and available for immediate use:

- a. First aid equipment and supplies approved by the consulting physician.
- b. Emergency eyewashes and showers which comply with ANSI Z358.1.
- c. Emergency-use respirators. For escape purposes, [] 5- to 15-minute emergency escape masks shall be supplied. For rescue purposes, [2] [] positive pressure self-contained breathing apparatus (SCBA) shall be supplied. These shall be dedicated for emergency use only and maintained onsite in the Contamination Reduction Zone.
- d. Fire extinguishers with a minimum rating of [20-A:120-B:C] [] shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.
- e. [].

1.23 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

Contractor's and subcontractor personnel working on CWM property shall abide by the applicable rules and regulations set forth by CWM during field activities. All emergency situations shall be administered by the Contractor's Site Safety Officer in coordination with CWM's Emergency Coordinator. Copies of CWM's Contingency Plan and Contractor Safety Procedures are included in Attachments 1 and 2, respectively. The Contractor's SSHP shall include these attachments if work is performed in CWM property and the Contractor shall coordinate any emergency and contingency procedures/measures with the property owner.

An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section .120 (l) and 29 CFR 1926 Section .65 (l), shall be developed and implemented as a section of the SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all onsite employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency; alert the Contracting Officer; and institute measures necessary to prevent repetition of the conditions or actions leading to, or resulting in, the emergency. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to such expected emergencies. The plan shall be rehearsed regularly as part of the overall training program for site operations. The plan shall be reviewed periodically and revised as necessary to reflect new or changing site conditions or information. \&Copies of the accepted SSHP and revisions shall be provided to the affected local emergency response agencies&\. The following elements, as a minimum, shall be addressed in the plan:

- a. Pre-emergency planning. The local emergency response agencies shall be contacted and met with during preparation of the Emergency Response Plan. Agencies to be contacted include local fire, police, and rescue authorities with jurisdiction and nearby medical facilities that may be utilized for emergency treatment of injured personnel. At these meetings, the agencies shall be notified of upcoming site activities and potential emergency situations. \&The response agencies' capabilities shall be ascertained and written response commitments obtained&\. The Contractor shall ensure the Emergency Response Plan for the site is compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and Federal agencies.

- b. Personnel roles, lines of authority, communications for emergencies.
- c. Emergency recognition and prevention.
- d. Site topography, layout, and prevailing weather conditions.
- e. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control).
- f. Specific procedures for decontamination and medical treatment of injured personnel.
- g. Route maps to nearest renotified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.
- h. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, Federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Contracting Officer and/or their alternates).
- i. Criteria for initiating community alert program, contacts, and responsibilities.
- j. Procedures for reporting incidents to appropriate government agencies. In the event that an incident such as an explosion or fire, or a spill or release of toxic materials occurs during the course of the project, the appropriate government agencies shall be immediately notified. In addition, the Contracting Officer shall be verbally notified immediately and receive a written notification within 24 hours. The report shall include the following items:
 - (1) Name, organization, telephone number, and location of the Contractor.
 - (2) Name and title of the person(s) reporting.
 - (3) Date and time of the incident.
 - (4) Location of the incident, i.e., site location, facility name.
 - (5) Brief summary of the incident giving pertinent details including type of operation ongoing at the time of the incident.
 - (6) Cause of the incident, if known.
 - (7) Casualties (fatalities, disabling injuries).
 - (8) Details of any existing chemical hazard or contamination.
 - (9) Estimated property damage, if applicable.
 - (10) Nature of damage, effect on contract schedule.
 - (11) Action taken to ensure safety and security.

(12) Other damage or injuries sustained, public or private.

k. Procedures for critique of emergency responses and follow-up.

1.24 CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGEMENT

A copy of a Contractor-generated certificate of worker/visitor acknowledgement shall be completed and submitted for each visitor allowed to enter contamination reduction or exclusion zones, and for each employee, following the example certificate at the end of this section.

1.25 INSPECTIONS

The SSHO shall perform daily inspections of the jobsite and the work in progress to ensure compliance with EM 385-1-1, the Safety and Health Program, the SSHP and other occupational health and safety requirements of the contract, and to determine the effectiveness of the SSHP. Procedures for correcting deficiencies (including actions, timetable and responsibilities) shall be described in the SSHP. Follow-up inspections to ensure correction of deficiencies shall be conducted and documented. Daily safety inspection logs shall be used to document the inspections, noting safety and health deficiencies, deficiencies in the effectiveness of the SSHP, and corrective actions taken. The SSHO's Daily Inspection Logs shall be attached to and submitted with the Daily Quality Control reports. Each entry shall include the following: date, work area checked, employees present in work area, PPE and work equipment being used in each area, special safety and health issues and notes, and signature of preparer. In the event of an accident, the Contracting Officer shall be notified according to EM 385-1-1. Within [2 working days] [] of any reportable accident, an Accident Report shall be completed on ENG Form 3394 and submitted.

1.26 SAFETY AND HEALTH PHASE-OUT REPORT

A Safety and Health Phase-Out Report shall be submitted within [10] [] working days following completion of the work, prior to final acceptance of the work. The following minimum information shall be included:

- a. Summary of the overall performance of safety and health (accidents or incidents including near misses, unusual events, lessons learned, etc.).
- b. Final decontamination documentation including procedures and techniques used to decontaminate equipment, vehicles, and onsite facilities.
- c. Summary of exposure monitoring and air sampling accomplished during the project.
- d. Signatures of Safety and Health Manager and SSHO.

EXAMPLE CERTIFICATE OF WORKER/VISITOR ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT _____
PROJECT ADDRESS _____
CONTRACTOR'S NAME _____
[EMPLOYEE'S] [VISITOR'S] NAME _____

The contract for the above project requires the following: that you be provided with and complete formal and site-specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

I HAVE READ, UNDERSTAND AND AGREE TO FOLLOW THE SITE SAFETY AND HEALTH PLAN FOR THIS SITE.

Name

Date

FORMAL TRAINING: I have completed the following formal training courses that meet OSHA's requirements:

Date Completed

40 hour: _____

8 hour supervisory: .. _____

8 hour refresher: _____

SITE-SPECIFIC TRAINING: I have been provided and have completed the site-specific training required by this Contract. The Site Safety and Health Officer conducted the training. _____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in [the Contractor's] [my Employer's] Respiratory Protection program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy.

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in [the Contractor's] [my employer's] Respiratory Program and have received a satisfactory fit. [I have been assigned my individual respirator.] I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time. _____

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there: were no limitations to performing the required work tasks; were identified physical limitations to performing the required work tasks.

Date medical exam completed _____

[Employee's] [Visitor's] Signature _____
Date _____

Printed Name _____

Social Security Number _____

Contractor's Site Safety and Health Officer Signature _____

Date _____

Printed Name _____

Social Security Number _____

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

~~/&&/~~

-- End of Section --

Table 01110-1

**Health Hazard Data for Chemicals Suspected
To Be Present in Work Areas (Components 1, 2, and 3) at Operable Unit No. 2**

Chemical Name	TLV/PEL	Odor Threshold Description	Health Effects Area
Acetone	750 ppm/ 1,000 ppm	13 - 100 ppm Colorless liquid mint-like odor	Eye, CNS, and skin irritant;
Aldrin	0.25 mg/m ³	NL Tan to dark; brown; mild chemical odor	High hazard; liver damage; experimental carcinogen
Ammonium Hydroxide	50 ppm	NL colorless liquid; very pungent odor	Poison by ingestion, severe eye irritant
Asbestos	0.1 fiber/cc	N/A Fine, slender, flaxy fibers; resists fire and most solvents	Lung
Benzene	10 ppm/1 ppm	4.68 - 12 ppm Colorless liquid; aromatic odor	Blood, CNS, skin, bone marrow, eyes, respiratory system
Boron (oxide)	10 mg/m ³	N/A Colorless, glassy granules or flakes; no odor	CNS, eyes, considered an industrial poison
2 - Butanone (MEK)	200 ppm	5.4 ppm Clear, colorless liquid; fragrant, mint-like moderately sharp odor	CNS, lungs
Cadmium	(0.05) 0.005 mg/m ³	NL Appearance and odor varies for specific compound	Respiratory system, kidneys, prostate and blood
Carbon Disulfide	10 ppm/ 20 ppm	0.0011 - 7.7 ppm liquid; strong, disagreeable or sweetish odor	CNS, PNS, CVS, eyes, kidneys, liver and skin
Carbon Tetrachloride	5 ppm/10 ppm	50 - 100 ppm Colorless liquid; ether-like odor	CNS, eyes, lungs, liver, kidneys and skin
Chlorobenzene	(75) ppm	0.68 - 60 ppm Colorless liquid; mild aromatic odor	Moderate hazard; CNS, respiratory system, eyes, skin, and liver

Table 01110-1 (Continued)

**Health Hazard Data for Chemicals Suspected
To Be Present in Work Areas (Components 1, 2, and 3) at Operable Unit No. 2**

Chemical Name	TLV/PEL	Odor Threshold Description	Health Effects Area
Chloroform	10 ppm/C50	50 - 300 ppm Colorless liquid; pleasant sweet odor	Liver, kidneys, heart, eyes and skin
Chromium	0.5 mg/m ³ / 1.0 mg/m ³	NL Varies depending upon specific compound	Skin
Decaborane	0.05 ppm	0.06 ppm Colorless solid; pungent odor	Acute CNS toxicity, skin
1,1-Dichloroethane	200 ppm/ 100 ppm	200 ppm Colorless liquid; chloroform-like odor	Skin, liver kidneys
1,2-Dichloroethane	10 ppm	88 ppm Clear liquid; sweet odor-like chloroform	Kidneys, liver, eyes, skin, CNS
Dieldrin	0.25 mg/m ³	NL colorless to light tan solid; mild, chemical odor	CNS, liver, kidneys, skin
4,4 - DDT	1 mg/m ³	NL Colorless solid; weak chemical odor	CNS, kidneys, liver, skin, PNS
Diethyl ether	400 ppm	0.33 - 8.9 ppm colorless liquid; characteristic, sweet, ether odor	CNS, skin, respiratory system, eyes
Dinitrotoluene	1.5 mg/m ³	N/A	Irritant, allergen, can cause anemia, cyanosis, and live damage
Ethyl benzene	100 ppm	2.3 - 200 ppm colorless aromatic liquid	Eyes, skin, and mucous membrane irritant, CNS
Ethyl Chloride	1,000 ppm	42 ppm colorless liquid or gas; pungent, ether-like odor	Liver, kidneys, respiratory CNS
Fuel Oil #2	300 ppm	NL Amber liquid	Sim. eye irritant

Table 01110-1 (Continued)

**Health Hazard Data for Chemicals Suspected
To Be Present in Work Areas (Components 1, 2, and 3) at Operable Unit No. 2**

Chemical Name	TLV/PEL	Odor Threshold Description	Health Effects Area
Hydrogen Chloride	5 ppm	0.77 - 10 ppm colorless gas; irritating, pungent odor	Respiratory system, skin, eyes
Lead (Inorganic fumes and dusts)	0.05 mg/m ³	NL Varies depending upon specific compound	GI tract, CNS, kidneys, blood, gingival tissue
Polycyclic aromatic hydrocarbons	NL	NL Colorless crystals	Suspected human carcinogen, skin irritant
Naphthalene	10 ppm	0.3 - 0.84 ppm colorless to brown solid; odor of mothballs	Eyes, blood, liver, kidneys, skin, RBC, CNS
Nitrotoluene	2 ppm 11 mg/m ³	N/A	Methemoglobinemia, absorbable via skin
Phenol	5 ppm	0.3 - 5.0 ppm Colorless to pink solid or thick liquid; characteristic, sweet, tarry odor	CNS effects; kidney and liver damage; experimental carcinogen
PCBs (1242, 1260)	1.0 mg/m ³	N/A Varies depending upon specific compound	Liver injurant, skin effects (chloracne)
Sodium Hydroxide	2 mg/m ³	N/A colorless, odorless solid	Eyes, respiratory system, skin
Tetrachloroethene (SYN: 1,1,2,2- tetrachloroethylene)	500 ppm/ 100 ppm	4.68 ppm Colorless liquid; Chloroform- like odor	Inhalation, eye and skin irritant, CNS
Toluene	100 ppm/ 200 ppm	2.14 - 2.9 ppm colorless liquid; aromatic odor- like benzene	CNS, liver, kidneys, skin
Trichloroethylene	50 ppm/ 100 ppm	21.4 - 28.0 ppm Colorless liquid, unless dyed; sweet odor- like chloroform	Respiratory system, heart, liver kidneys, CNS, skin
Trinitrotoluene	0.5 mg/m ³ 1.5 mg/m ³	N/A	Eye irritant, headache, weakness, anemia, liver injury
Xylenes (o-,m-, and p-isomers)	100 ppm	1.1 ppm colorless liquid; aromatic odors	CNS, eyes, GI tract, blood liver, kidneys, skin

NL = not listed
NA = not available
N/A = not applicable

() = Values enclosed are those for which changes are proposed.

References:

TLV manual, 1990 - 1991
Odor Thresholds Manual
Sax, N. Irving. "Dangerous Properties of Industrial Materials"
OSHA 29 CFR 1910.1000 Z table

Table 01110-2

Suggested Action Levels

Contaminant Hazard	Monitoring Instrument	Sustained Level	Action
Combustible Gases-Fire Hazard	Combustible Gas Indicator	<10% 10-25% LEL >10% >25% LEL	Proceed with caution. Evacuate to safe distance.
Oxygen Level	Oxygen Lever Meter	<19.5% O ₂ 19.5% O ₂ >23.5 25% O ₂	Leave area. Reenter only with self-contained breathing apparatus (Level B). Work may continue. Investigate changes from 21%. Stop work. Ventilate before returning.
Airborne Dust	Mimiram	<0.5 mg/m ³ 0.5-1.0 mg/m ³ >1.0 mg/m ³	Complete the task. Cease work temporarily and upgrade to Level C. Stop field activities and move to an area where normal levels are indicated.
Acid Gases & Vapors (HCN, H ₂ S, HCl)	Colorimetric Indicator Tubes	Compound Specific	Level C protection Level B protection
Organic Vapors	OVA or OVM	Background Background to <1 ppm >25 ppm	Level D Level C Level B
Radiation	Radiation Detector for Gamma and X-rays Alpha Scintillating Detector, Pancake G-M Detector, Micro-R Meter Micro-R Meter	0-0.1 mR/hr 0-2.1 mR/hr >1 mR/hr <3 time background 3 times background to <1 mR/hr >1 mR/hr	Complete the task. Proceed with caution. Evacuate to safe distance. Continue work. Radiation above background levels (normally 0.01 to 0.02 mR/hr/g) signifies possible source(s) of radiation present. Continue investigation with caution. Perform thorough monitoring. Consult a Health Physicist. Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of a Health Physicist.
Noise	Sound Level Meter	<85 dBA >85DBA	No Action Hearing Protection Required

Table 01110-3

Area Specific Anticipated contaminant Hazard

Anticipated Hazard							
Area	Noise	Combustible Gases - Fire Hazard	Oxygen Level	Airborne Dust	Acid Gases & Vapors (HCN, H ₂ S, HCL)	Organic Vapors	Radiation
Chemical Waste Sewer	X	X	X		X	X	
TNT Pipeline	X	X	X		X	X	X

DEPARTMENT OF THE ARMY

CEGS-01300 (December 1994)

(Consistent with CENAN CO-CQ 6/97)

U.S. ARMY CORPS OF ENGINEERS

Superseding

CEGS-01300

(July 1993)

CEGS-01305

(July 1993)

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

Includes note relocation Special change (August 1995)

Includes Text Adjustment change 1 (coding) (March 1995)

Includes changes through Notice 3 (September 1996)

Latest Notice change indicated by \&\ tokens

SECTION 01300

SUBMITTAL PROCEDURES 12/94

NOTE: This guide specification covers procedures to be used in making submittals called for in other sections of the specifications. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.

PART 1

GENERAL

NOTE: SPECSINTACT includes 19 submittal descriptions. The \&ten\ submittal descriptions used in Corps of Engineers guide specifications (CEGS Series) are included in this guide specification. The other \&nine\ submittal descriptions are used by the Naval Facilities Engineering Command (NAVFAC); therefore if NAVFAC guide specifications are used in a Corps project the following conversion should be made:

NAVFAC SD Number and Title	Convert To
SD-02 Manufacturer's Catalog Data	SD-01 Data
SD-03 Manufacturer's Standard Color Charts	SD-01 Data
SD-05 Design Data	SD-01 Data
SD-10 Test Reports	SD-09 Reports
SD-11 Factory Test Report	SD-09 Reports
SD-12 Field Test Report	SD-09 Reports
SD-15 Color Selection Samples	SD-14 Samples
SD-16 Sample Panels	SD-14 Samples
SD-17 Sample Installation	SD-14 Samples \&\

Definitions of submittals used in Corps of Engineers guide specifications (CEGS-Series) are as follows:

SD-01 Data

Submittals which provide calculations, descriptions, or documentation regarding the work.

SD-04 Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-06 Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions. ~~&&~~

SD-07 Schedules

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

SD-08 Statements

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

SD-09 Reports

Reports of inspections or tests, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used shall be identified and test results shall be recorded.

SD-13 Certificates

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

SD-14 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

SD-18 Records

Documentation to record compliance with technical or administrative requirements.

~~&~~SD-19 Operation and Maintenance Manuals

Data which forms a part of an operation and maintenance manual. ~~&~~~~SPECSINTACT is programmed to produce a submittal list or submittal register based on coding included in the various technical sections. When preparing sections not covered by guide specifications, coding must be added for automatic generation of the submittal register. SPECSINTACT steps used in producing the submittal register are provided below as background information for adding coding.~~

1. ~~Go to SUBMITTALS paragraph of a section.~~
2. ~~Go to a coded item in the SUBMITTALS paragraph.~~
3. ~~Find occurrences of the coded item in the text and enter data on submittal register.~~

4. ~~Repeat steps 1, 2, and 3 for each coded item in the SUBMITTALS paragraph.~~
5. ~~Repeat steps 1, 2, 3, and 4 for each section in the project.~~

1.1 SUBMITTAL CLASSIFICATION

Submittals are identified with submittal description (SD) numbers and are classified as follows:

1.1.1 Government Approved (GA)

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings."

1.1.2 Information Only (FIO)

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.2 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the CQC requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.3 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.4 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) representative and each item

shall be stamped, signed, and dated by the CQC representative indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.2 SUBMITTAL REGISTER (ENG FORM 4288)

~~NOTE: ENG Form 4288 is not a part of this guide specification; the completed ENG Form must be developed locally for each project.~~

At the end of this section is one set of ENG Form 4288 (Attachment 1) listing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The Contractor will also be given the submittal register as a diskette containing the computerized ENG Form 4288 and instructions on the use of the diskette. Columns "d" through "q" have been completed by the Government; the Contractor shall complete columns "a" and "r" through "t" and submit the forms (hard copy plus associated electronic file) to the Contracting Officer for approval within ~~[30]~~ calendar days after Notice to Proceed. The Contractor shall keep this diskette up-to-date and shall submit it to the Government together with the monthly payment request. The approved submittal register will become the scheduling document and will be used to control submittals throughout the life of the contract. The submittal register and the progress schedules shall be coordinated.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of ~~[30]~~ calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. ~~An additional [] calendar days shall be allowed and shown on the register for review and approval of submittals for [food service equipment] [and] [refrigeration and HVAC control systems].~~

3.4 TRANSMITTAL FORM (ENG FORM 4025)

~~NOTE: ENG Form 4025 is not a part of this guide specification; the sample ENG Form 4025 must be added to this section locally.~~

The sample transmittal form (ENG Form 4025) attached to this section (Attachment 2) shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item. If this form is available under the RMS system the contractor will be required to generate it and process it electronically.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 Procedures

At the Quality Control Coordination meeting, or preconstruction conference, the Contractor shall ascertain the name and address of each individual, agency, or firm who is designated to normally receive items for approval, for information or samples. The Contractor shall complete ENG Form 4025, entering each item requiring a separate approval action as a separate item on the form, for each transmittal. A transmittal may consist of one or more 4025 sheets. The transmittal, consisting of ENG Form 4025 plus all applicable submittals, is then sent to the appropriate individual. On critical items the Contractor is encouraged to confirm receipt via telephone.

~~NOTE: Add applicable procedures, including where to be submitted and number of copies required.~~

The Contractor shall submit to the Contracting Officer a total of 8 copies, unless otherwise specified, of each submittal listed in ENG Form 4025. Where specified, the Contractor shall provide additional copies to the distribution list presented in Attachment 3.

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. ☐ Six copies of the submittal will be retained by the Contracting Officer and ☐ 2 copies of the submittal will be returned to the Contractor.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR	
(Firm Name)	
_____	Approved
_____	Approved with corrections as noted on submittal data and/or attached sheets (s).
SIGNATURE: _____	
TITLE: _____	
DATE: _____	

-- End of Section --

ATTACHMENTS

ATTACHMENT 1 - ENG FORM 4288

ATTACHMENT 2 - ENG FORM 4025

ATTACHMENT 3 - SUPPLEMENTAL DISTRIBUTION LIST

SUBMITTAL REGISTER (ER 415-1-10)																							CONTRACT NO.	
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR								SPECIFICATION SECTION 01030	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT	CODE	DATE	
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		3.2.2	Shut Down Request				x							x	AR									
		3.3	Advance Notice				x						x		AR									
		13.4	Summarization	x									x		AR									

SUBMITTAL REGISTER (ER 415-1-10)																							CONTRACT NO.	
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR								SPECIFICATION SECTION 01110	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL								CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS		
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT		CODE	DATE
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		1.3	Work Zones		x									x	AR									
		1.3	Decontamination Facilities		x									x	AR									
		1.3	Monitoring/Sampling Results	x									x		AR									
		1.3	Site Control Log									x	x		AR									
		1.7	Site Safety and Health Plan						x					x	AR									
		1.7.4	Accident Prevention Plan						x					x	AR									
		1.10	Activity Hazard Analysis Plan						x					x	AR									
		1.12	Training Certificates							x			x		AR									
		1.8.3	Explosives Operations Plan						x					x	AR									
		1.23	Emergency Response Plan						x					x	AR									
		1.26	Safety and Health Phase-Out Report						x					x	AR									

SUBMITTAL REGISTER (ER 415-1-10)																							CONTRACT NO.	
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR								SPECIFICATION SECTION 01310	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT	CODE	DATE	
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		1.1	Initial Project Schedule				x							x	AR									
		1.1	Preliminary Project Schedule				x							x	AR									
		1.1	Periodic Schedule Updates						x					x	AR									
		1.1	Qualifications									x	x		AR									
		1.1	Narrative Report						x					x	AR									
		1.1	Schedule Reports						x					x	AR									
		3.7.2	Justification for Delay	x										x	AR									
		3.8	Proposed Schedule Revisions				x							x	AR									

SUBMITTAL REGISTER (ER 415-1-19)																							CONTRACT NO.			
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR										SPECIFICATION SECTION 01440	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS		
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT	CODE	DATE			
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.		
		3.2.1	Contractor's Quality Control Plan	x										x	AR											
		3.2.4	Notification of Change					x						x	AR											
		3.3	Minutes									x	x		AR											
		3.4.5	Request for Organ. Changes						x					x	AR											
		3.6.1k	Phase Notification - Minutes					x					x		AR											
		3.6.2f	Phase Notification - Minutes					x					x		AR											
		3.7.1	Testing Procedures					x						x	AR											
		3.7.1e	Tests Performed									x	x		AR											
		3.7.1e	Test Reports						x				x		AR											
		3.8.1	Punchlist						x					x	AR											
		3.8.2	Completion Notification					x						x	AR											
		3.9	QC Records									x		x	AR											

SUBMITTAL REGISTER (ER 415-1-10)																							CONTRACT NO.	
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR								SPECIFICATION SECTION 01450	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O N O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT	CODE	DATE	
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		1.4	Chemical Quality Control Plan					x						x	AR									
		1.4	Sampling and Analysis Plan					x						x	AR									
		1.4	Interim Sampling and Analysis Plan					x						x	AR									
		1.4	Daily Chemical Quality Control Reports					x					x		AR									
		1.4	Chemical Quality Control Summary Reports					x						x	AR									
		1.4	Chemical Data Interim Report					x					x		AR									
		3.2.4	Notification of Change					x						x	AR									
		3.3	Minutes					x						x	AR									

SUBMITTAL REGISTER (ER 415-1-10)																				CONTRACT NO.				
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK														CONTRACTOR						SPECIFICATION SECTION 01500				
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT	CODE	DATE	
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		1.1.1.1	Site Operations Plan a. Dust Control Plan (Section 1561) b. Temporary Facilities Plan (paragraph 1.5) c. Erosion and Sedimentation Control Plan (Section 1561) d. Utility Hookup Plan (paragraph 1.2) e. Soil Backfill Staging and Grading Plan (Section 02230 and Section 02227) f. Contaminated Soils, Sediments, Liquids and Demolition Waste Staging/Storing Transporting Plan (Sections 02141, 02142, 02226, and 02228) g. Demolition Plan (Section 2050) h. Decontamination Plan (Section 02143) i. Lift Station and Pipeline Flushing and Sediment/Liquid Handling Plan (Section 02228) j. Excavation Staging and Handling Plan-TNT Pipeline (Section 02229) k. PCB Remediation Plan (Section 02230)					x						x	AR									
		1.2.2	Connections					x						x	AR									
		1.11	Protection of Monitoring Wells					x						x	AR									

SUBMITTAL REGISTER (ER 415-1-10)																							CONTRACT NO.	
TITLE AND LOCATION REMEDIAL DESIGN FOR INTERIM REMOVAL ACTIONS FORMER LAKE ONTARIO ORDNANCE WORKS LEWISTON AND PORTER, NIAGARA COUNTY, NEW YORK															CONTRACTOR								SPECIFICATION SECTION 02120	
		SPECIFICATION PARAGRAPH NO.	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL								CLASSI- FICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS		
TRANS- MITTAL NO.	ITEM NO.			D A T A	D R A W I N G S	I N S T R U C T I O N S	S C H E D U L E S	S T A T E M E N T S	R E P O R T S	C E R T I F I C A T E S	S A M P L E S	R E C O R D S	I N F O N L Y	G O V. A P P R O V E D	R E V I E W E R	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERN- MENT		CODE	DATE
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.
		1.2	Off-Site/On-Site Hazardous Waste Management	x									x											
		1.2	Off-Site/On-Site Non-Hazardous Waste Management	x									x											
		1.2	Recordkeeping						x				x											
		1.2	Spill Response						x				x											
		1.2	Exception Reports						x				x											
		1.2	Qualifications							x			x											
		1.2	Off-Site Policy Compliance Certification							x			x											
		1.2	Certificates of Disposal							x			x											
		1.2	Packagings Certification							x				x										
		1.2	Notices of Non-Compliance and Violation								x		x											

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR
MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE _____

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

IO:

FROM:

CONTRACT NO.

CHECK ONE:

☐ THIS IS A NEW TRANSMITTAL

☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (Cover only one section with each transmittal)

PROJECT TITLE AND LOCATION

[illegible]

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.)

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

DATE

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4208 for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

- | | |
|---|--|
| A -- Approved as submitted | E -- Disapproved (See attached) |
| B -- Approved, except as noted on drawings. | F -- Receipt acknowledged |
| C -- Approved, except as noted on drawings.
Refer to attached sheet resubmission required. | FX -- Receipt acknowledged, does not comply
as noted with contract requirements |
| D -- Will be returned by separate correspondence. | G -- Other (Specify) |

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

Reverse of ENG Form 4025

01300-7

SUPPLEMENTAL DISTRIBUTION SHEET LIST
(To Be Provided by USACE, Buffalo, NY District)

DEPARTMENT OF THE ARMY

GUIDE SPECIFICATIONS ONLY

CEGS-01310 (December 1994)

U.S. ARMY CORPS OF ENGINEERS

Superseding

CEGS-01310 (October 1994)

LAKE ONTARIO ORDNANCE WORKS

LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~

~~Includes Text Adjustment Change (Section 01300 Reference) (March 1995)~~

SECTION 01310

PROJECT SCHEDULE

12/94

~~NOTE: This guide specification covers the requirements for the preparation and maintenance of the project schedule. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.~~

PART 1

GENERAL

~~NOTE: Selection of the optional requirements in this CEGS should be coordinated with Construction Division to assure that the schedule requirements are appropriate for the complexity of the constructability portion of the BCOE review. See ER 415 1 11.~~

~~If it is desired to monitor a Contractor's schedule by use of an in house program, this will require use of the Standard Data Exchange Format. Use of proprietary systems shall not be specified. See ER 1 1 11 and Appendix.~~

1.1 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary or adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-07 Schedules

Initial Project Schedule; GA. Preliminary Project Schedule; ~~GA~~. Periodic Schedule Updates; GA.

~~Eight (8)~~ copies of the schedules showing codes, values, categories, numbers, items, etc., as required.

SD-08 Statements

Qualifications; ~~FIO~~

Documentation showing qualifications of personnel preparing schedule reports.

SD-09 Reports

Narrative Report; ~~GA~~ Schedule Reports; ~~GA~~

~~Eight (8)~~ copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.2 QUALIFICATIONS

~~NOTE: Delete last two sentences if not necessary.~~

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. ~~Qualifications of this individual shall be submitted to the Contracting Officer for review with the Preliminary Project Schedule submission.~~

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments. ~~As specified, activities by the contractor that may disrupt traffic on roadways within the CWM property, must be scheduled to minimize the impact to CWM's operations. Scheduling contractor's activities to minimize impact to CWM's operations shall be coordinated through the Contracting Officer. This issue shall be discussed at the Preconstruction Conference and be reflected in the Project Schedule.~~

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the Contracting Officer to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, then the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in either the Precedence Diagram Method (PDM) or the Arrow Diagram Method (ADM). If approved by the Contracting Officer, the Contractor has the option of using a chart or bar chart type schedule that clearly defines the stop and start dates of each activity and the dependences between activities. Dependences between start and finish dates of activities shall be clearly identified. Where applicable, float shall be shown.

3.3.2 Level of Detail Required

With the exception of the initial and preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1 Activity Durations

Contractor submissions shall be required to follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods. A rule of thumb, that the Contractor should use, is that less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days.

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

3.3.2.3 Government Activities

Government and other agencies activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

3.3.2.4 Workers Per Day

~~NOTE: Delete this paragraph if not necessary.~~

~~All activities shall have an estimate of the average number of workers per day that are expected to be used during the execution of the activity. If no workers are required for an activity, in the case of activities related to procurement, for example, then the activity shall be identified as using zero workers per day. The workers per day information for each activity shall be identified by the Workers Per Day~~

Code.

3.3.2.5 Responsibility

~~NOTE: Delete this paragraph if not necessary.~~

~~All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.~~

3.3.2.4 Work Areas

~~NOTE: Delete this paragraph if not necessary.~~

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.75 Modification or Claim Number

~~NOTE: Delete this paragraph if not necessary.~~

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number.

3.3.2.8 Bid Item

~~NOTE: Delete this paragraph if not necessary.~~

~~All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one Bid Item. The Bid Item for each appropriate activity shall be identified by the Bid Item Code.~~

3.3.2.9 Phase of Work

~~NOTE: Delete this paragraph if not necessary.~~

~~All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not be allowed to contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.~~

3.3.2.10 Category of Work

~~NOTE: Delete this paragraph if not necessary.~~

~~All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited to, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start up, and testing. The category of work for each activity shall be identified by the Category of Work Code.~~

3.3.2.11 Feature of Work

~~NOTE: Delete this paragraph if not necessary.~~

~~All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.~~

3.3.3 Scheduled Project Completion

The schedule interval shall extend from notice-to-proceed to the contract completion date.

3.3.3.1 Project Start Date

~~NOTE: Delete last two sentences if not necessary.~~

The schedule shall start no earlier than the date that the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

~~NOTE: Delete last two sentences if not necessary.~~

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity call "End Project". The "End Project" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion, the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted at every project schedule update period to assist the Contracting Officer to evaluate the Contractor's ability to actually complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 ~~Start Phase~~

~~NOTE: Delete this paragraph if not necessary.~~

~~The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have: a "ES" constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.~~

3.3.4.2 ~~End Phase~~

~~NOTE: Delete this paragraph if not necessary.~~

~~The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have: a "LF" constraint, a constraint date equal to the completion date for the project, and a zero day duration.~~

3.3.4.3 ~~Phase X~~

~~NOTE: Delete this paragraph if not necessary.~~

~~The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X:" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.~~

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in progress or completed activity and insure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) shall be allowed only by the case-by-case approval of the Contracting Officer. The Contracting Officer may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

3.3.7 Extended Non-Work Periods

~~NOTE: Delete this paragraph if not necessary.~~

Designation of Holidays to account for non-work periods of over [5] [] days shall not be allowed. Non-work periods of over [5] [] days shall be identified by addition of activities that represent the delays. Modifications to the logic of the project schedule shall be made to link those activities that may have been impacted by the delays to the newly added delay activities.

3.3.8 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first [60] [] calendar days shall be submitted for approval within [20] [] calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed [60] [] calendar days after Notice to Proceed.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within [40] [] calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Periodic Schedule Updates

Based on the result of progress meetings, specified in "Periodic Progress Meetings," the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer or to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative, is necessary for verifying the contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

~~NOTE: Delete this paragraph if not necessary.~~

The Contractor shall submit, with the Initial Project Schedule, a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Work Area's Responsibility Code Value, "TNTP-ELE", may be identified as "TNT Pipeline Electrical Subcontractor." Activity code values shall represent the same information throughout the duration of the contract. Once approved with the Initial Project Schedule submission, changes to the activity coding scheme must be approved by the Contracting Officer.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the initial submission, and every periodic

project schedule update throughout the life of the project:

3.5.1 Data Disks

[Three] [] data disks containing the project schedule shall be provided. Data on the disks shall be in the format specified in [].

3.5.1.1 File Medium

Required data shall be submitted on [3.5] [] disks, formatted to hold [1.44 MB] [] of data, under the [MS-DOS] [] [Version 5.0] [] operating system.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the [MS-DOS] [] version used to format the disk.

3.5.1.3 File Name

~~NOTE: Delete this paragraph if not necessary.~~

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will insure that the names of the files submitted are unique. the Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the [4] [] most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in-progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to [activity number] [or] ["I-NODE" AND "J-NODE"] and then

sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.3 Total Float Report

A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.5.4.4 Earnings Report

~~NOTE: Other reports are available and may be specified as needed. Care should be exercised so as not to require excessive reports which will not contribute to effective management.~~

A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: [Activity Number] [or] ["i-node" and "j-node"], Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission [and on [monthly] [or] [quarterly] schedule update submissions] [____]. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a ~~weekly~~ monthly on-site meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor will describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost to Date shall be subject to the approval of the Contracting Officer. The following minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment shall be based on earnings for each in-progress or completed activity. Payment for individual activities shall not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, [lag durations,] and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities are those delays beyond the Contractors control such as strikes and unusual weather. Also included are delays encountered due to submittals, Government Activities, deliveries or work stoppage which makes re-planning the work necessary, and when the schedule does not represent the actual prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's determination as to the number of allowable days of contract extension, shall be based upon the project schedule updates in effect for the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under two weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any request for time extension for over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the

proposed revisions, the Contracting Officer may furnish the Contractor suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until the Contractor submits revisions, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer, then the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor will continue to update their schedule with the Contracting Officer's revisions until a mutual agreement in the revisions may be made. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS 01440 (October 1994)

Superseding
CEGS 01440 (July 1993)

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note-relocation Special change (August 1995)~~

~~Includes changes through Notice 2 (August 1995)~~

~~Latest Notice change indicated by \&\ tokens~~

SECTION 01440

CONTRACTOR QUALITY CONTROL

10/94

~~NOTE: This guide specification covers requirements for Contractor Quality Control. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.~~

PART 1 GENERAL

~~N O T E : S e e A d d i t i o n a l N o t e A .~~

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 (1994a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 (1993b) Agencies Engaged in the Testing and/or Inspection of Materials Used in construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause entitled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 30 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause entitled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, analytical laboratories, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01300 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance of field and laboratory (on-site and/or off-site) testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 14 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

~~NOTE: Specifier insert desired requirements. Select appropriate options. Evaluate the project to determine the level of CQC System Manager required and select options accordingly.~~

The Contractor shall identify as CQC System Manager an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a ~~degreed graduate engineer or scientist, graduate architect,~~ or a graduate of construction management, with a minimum of 3 years construction experience on construction similar to this contract. ~~The CQC Manager may also be a construction person with a minimum of 8 years in related work.~~ This CQC System Manager shall be on the site at all times during construction and will be employed by the prime Contractor. The CQC System Manager shall be ~~assigned no other duties~~ [assigned as System Manager but may have other duties including as project superintendent in addition to quality control.] An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate will be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

NOTE: Insert desired requirements if the complexity, or size of the project warrants specialized individuals in specific disciplines to perform quality control. Select options accordingly.

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: ~~electrical,~~ ~~mechanical,~~ civil, ~~structural,~~ and environmental. ~~architectural,~~ ~~materials technician,~~ ~~submittals clerk,~~ ~~occupied family housing coordinator~~. These individuals ~~shall be directly employed by the prime Contractor~~ may be employees of the prime or subcontractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; and have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals ~~shall have no other duties other than quality control.~~ may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix

Area	Qualifications
a. Civil/ Geotechnical	Degreed Graduate Civil/ Geotechnical Engineer with 2 years experience in the type of work being performed on this project or technician with 5 years related experience
b. Mechanical	Graduate Mechanical Engineer with 2 years experience or person with 5 years related experience
c. Electrical	Graduate Electrical Engineer with 2 years related experience or person with 5 years related experience
d. Structural	Graduate Structural Engineer with 2 years experience or person with 5 years related experience
e. Architectural	Graduate Architect with 2 years experience or person with 5 years related experience
ff. Environmental	Degreed Graduate Environmental Engineer or scientist with 3 years experience
g. Submittals	Submittal Clerk with 1 year experience

h. Occupied family housing

Person, customer relations type, coordinator experience

i. Concrete, Pavement and Soils

Materials Technician with 2 years experience for the appropriate area

3.4.4 Additional Requirement

~~NOTE: This paragraph will be used after 1 July 1995. It may be included before that time if the district has started teaching the course and the required training is available at least quarterly.~~

~~In addition to the above experience and education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This course is periodically offered at [____]. The Contractor's Quality Control System Manager (CQCSM) is required to successfully complete the Corps of Engineers Construction Quality Management Course (CECOMC). Successful completion of the CECOMC within ninety (90) calendar days after NTP is a mandatory requirement for the position of the Quality Control System Manager. Certification is good for five (5) years at which time retraining is required. The Contractor's QC Systems Manager may be appointed and serve fully in that capacity pending certification. If the CQC Systems Manager fails to successfully complete the training, the Contractor should immediately appoint a new CQCSM who shall then attend the next available course. The course is twelve (12) hours (1 1/2 days) in length. The Construction Quality Management Course (CQMC) will be taught at least six (6) times per year at the Baltimore District Corps of Engineers, City Crescent Building, 10 South Howard Street, Baltimore, MD, or at another site if conditions warrant. The CQMC cost shall be borne by the Contractor at thirty (\$30.00) dollars per course, per person. Payment will be by check made payable to F&A Officer of the Corps of Engineers at or prior to the start of the course. The Contractor has ninety (90) calendar days to attend the course after the issuance of the NTP. The Contractor shall contact the Contracting Officer upon award of the contract for arrangements for the course.~~

3.4.5 Organizational Changes

The Contractor shall maintain his CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS

Submittals shall be made as specified in Section 01300 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

~~&~~This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:~~&~~

- a. A review of each paragraph of applicable specifications.

- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.6.5 Definable Feature of Work Definition and Discussion

A Definable Feature of Work (DFW) is a portion of work consisting of materials, equipment, supplies and procedures which are closely related to each other, have the same control and will be accomplished by the same work crew to completion. A DFW must be sufficiently small so that control of the work (i.e., communication of requirements to workers, inspection of materials and workmanship and correction of deficiencies) will be easily accomplished. Some examples are:

- Rough-in of electrical boxes and wiring methods.
- Lighting fixtures, receptacles, and accessories.
- Panelboards, circuit breakers and motors.
- Water supply piping, fittings and supports.
- DWV piping, fittings and supports for plumbing.
- Concrete reinforcement and formwork.
- Concrete mixing, placement, curing and finishing.
- Testing Procedure for contaminated soil, materials and storage tank contents.
- Storage Tank disassembly and removal.
- Setting up of decontamination area, exclusion zones, and standard safety procedures.
- Chemical Data Acquisition.
- Preparation, removal and disposal of contaminated material.
- Soil/sediment/pipeline contents removal and disposal.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to

the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements and the Quality Assurance Project Plan (QAPP) specified in section 01450 CHEMICAL DATA QUALITY CONTROL.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of \$1,500 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 On-Site Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

~~NOTE: Insert appropriate addresses.~~

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

For delivery by mail:

For other deliveries: ☐

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 ~~& Punch List Inspection~~

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished the Contractor shall notify the Government that the facility is ready for the Government "Pre-Final" inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that all waste generated during the IRA has been removed and properly transported for disposal, staging areas verified cleaned, confirmation that sampling results have been properly reported, and, stock pile/staging areas and remediated areas have been restored to final grades and a vegetated cover or other designated cover has been established/installed in accordance with the specifications/drawings. ~~the facility is complete and ready to be occupied.~~ A Government "Pre-Final Punch List" may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected and so notify the Government so that a "Final" inspection with the customer can be scheduled. Any items noted on the "Pre-Final" inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, his superintendent or other primary management person and the contracting Officer's representative will be in attendance at this inspection. Additional Government personnel including, but not limited to, those from property owners and NYSDEC Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice will be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and must include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause entitled "Inspection of Construction". ~~&~~

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.

- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within [16] hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel. All documentation is expected to be literate, legible and complete.

3.10 SAMPLE FORMS

~~NOTE: List enclosed forms. Sample forms are not apart of this guide specification and should be provided by the specifier.~~

~~Sample enclosed at the end of this section.~~

a. The 2-page form at the end of the section will be used for the basic CQC Report (Attachment 1). CQC personnel shall attach continuation sheets as required for any entries which cannot fit on the basic form. Preparatory and Initial Inspections, when performed, shall be indicated on the basic CQC report and minutes for each inspection shall be attached. Minutes will consist of a list of specific requirements for materials, procedures or equipment to be employed and shall also include any understanding reached or items of special importance discussed.

b. In addition, outstanding deficiencies shall be listed on the form "List of Outstanding Deficiencies" (Attachment 2 at the end of this section) and shall be attached to each CQC report. As deficiencies are corrected, they are to be acknowledged on the basic CQC report and shall be deleted from the list.

c. Form at the end of this section entitled "CQC Test Report List" (Attachment 3) shall be used by the Contractor to track testing to be done as the project progresses, and also to summarize the Contractor's

Quality Control testing to be reported on the CQC Plan.

d. Form "Record of Preparatory and Initial Inspections" (Attachment 4 at the end of this section) shall be used by the Contractor to track Preparatory and Initial Inspections as the project progresses and also to summarize these required inspections as part of the CQC Plan.

e. Additional reporting forms pertaining to specialized activities may be included herein or elsewhere in the contract, and shall be used for reporting as indicated.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor. Deficiencies cited and verbal instructions given to the Contractor by the Government Representative shall be entered into that day's CQC Report.

(Forms Follow)

-- End of Section --

ATTACHMENTS

ATTACHMENT 1 - CQC REPORT

ATTACHMENT 2 - LIST OF OUTSTANDING DEFICIENCIES

ATTACHMENT 3 - CQC TEST REPORT LIST

**ATTACHMENT 4 - RECORD OF PREPARATORY AND INITIAL
INSPECTION**

CQC REPORT

1. Project Title: _____

Location: _____ Contract No.: _____

2. List Contractors and Subs Working This Day and Areas of Responsibility of each:

3. Weather:

4. Description and Location of Work of the Project
(Also Indicate Days of No Work and reasons for Delay)

5. Labor and Equipment Breakdown by Trade (Attach Continuation)

6. Follow-Up Inspections Performed, Results and Corrective Actions Taken:

7. Job Safety. Indicate What Was Checked, Results, Instructions Received and corrective Actions:

8. Additional Activities and Remarks (Check Appropriate Box)

- [] a. Prep or Initial Insp. Held. Attach Minutes.
- [] b. Testing Performed. Attach Results.
- [] c. Outstanding Deficiencies. See Attached List
- [] d. Verbal Instructions Received.
- [] e. Delivery of Equipment and Materials.
- [] f. Submittal Actions.
- [] g. Misc/Remarks.

Use Space Below To Discribe Checked Items

[illegible]

9. Contractor's Verification: "The above report and attachments are complete and all Supplies, Materials, Equipment and Workmanship incorporated into the work are in full compliance with the contract except as noted":

Signed _____

CQC Representative

Date _____

SH _____ OF _____ DATE: _____

CONTRACTOR: _____

CONTRACT #:

[illegible]

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK OUTSTANDING CONSTRUCTION DEFICIENCIES

CQC TEST REPORT LIST

CQC REPORT # _____ SH _____ OF _____

DATE: _____

CONTRACTOR: _____

CONTRACT #: _____

PROJECT TITLE: _____

LOCATION: _____

SPEC REF OR DWG#	TYPE OF TEST	DATE PERFORMED	RESULTS	REMARKS

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK CQC TESTING. PROVIDE ATTACHMENTS AS REQUIRED.

RECORD OF PREPARATORY AND INITIAL INSPECTIONS

DATE OF INSP	TYPE OF INSP	DEFINABLE FEATURE OF WORK (DESCRIBE)	REPORT NOS		PERSONS ATTENDING INSP	WAS MATL&/OR EQUIPMENT PHYSICALLY INSPECTED ?
			QA	QC		

NAD FORM 826
22 JULY 86

NOTE: THIS FORM SHALL BE USED BY THE CONTRACTOR TO TRACK PREP/INIT INSP'S
ATTACH ADDITIONAL RESULTS OR COMMENTS AS REQUIRED

GUIDE SPECIFICATIONS ONLY

DEPARTMENT OF THE ARMY

CEGS-01450 (November 1994)

U.S. ARMY CORPS OF ENGINEERS

LAKE ONTARIO ORDNANCE WORKS

LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~

~~Includes Text Adjustment Change (Section 01300 Reference)(March 1995)~~

SECTION 01450

CHEMICAL DATA QUALITY CONTROL

11/94

~~NOTE: This guide specification covers requirements for Chemical Data Quality Control for remedial action of Hazardous, Toxic, and Radioactive Waste (HTRW) contaminated sites. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.~~

PART 1 GENERAL

~~NOTE: This guidance is applicable to remedial actions involving HTRW that are conducted by the U.S. Army Corps of Engineers (USACE). It includes the collection and the analyses of environmental samples and chemical process parameter measurements required for the preremedial activities, remediation, and post remediation phases. This includes chemical measurements of soil, water, air, and other chemical parameters required for Defense Environmental Restoration Program (DERP), Base Realignment and Closure (BRAC), Installation Environmental Compliance, Military Construction, Superfund, Civil Works, and other construction projects involving HTRW.~~

~~Publications included in this guide spec are applicable to chemical data quality control for HTRW remedial actions. Provide references in the project specifications that are required to attain the project chemistry measurements. References for Sampling and/or analytical procedures must be for the most recent update of the method. Include additional references in the specification which are unique to the project such as the Design Analysis (DA), Record of Decision (ROD), Federal, state and local applicable or relevant and appropriate requirements (ARARs), remedial technology, innovative technology requirements, unique contaminants, etc. Use references in the CCDQC Section that do not conflict and are compatible with references in other sections of the specification. State in the specification whether a reference provided is mandatory or provided as guidance.~~

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENVIRONMENTAL PROTECTION AGENCY

EPA-450/4-89-015

(1989) Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites (Stages I & II)

EPA-450/4-90-005

(1991) Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites, (Stage III)

EPA-540/R-93-071

(1993) Data Quality Objectives Process for Superfund

CODE OF FEDERAL REGULATIONS

40 CFR 172

Hazardous Material Table, Special Provisions, Hazardous Material Communications, Emergency Response Information, and Training Requirements

49 CFR 178

Specifications for Packaging

40 CFR 261

Identification and Listing of Hazardous Wastes

40 CFR 262

Standards Applicable to Generators of Hazardous Wastes

40 CFR 268

Land Disposal Restrictions

1.2 ACRONYMS AND DEFINITIONS

~~NOTE: Acronyms included in this guide spec are defined in the specification language, but are not required for all projects. Define all acronyms used in this (CCDQC) section and require the Contractor to define all acronyms used in all contract required products. Acronyms included in the CCDQC Section must not conflict and must be compatible with definitions and acronyms in other sections of the specification.~~

1.2.1 Acronyms

The definition of acronyms used by the Contractor which pertain to chemical data quality control shall be clearly defined for all contract related products and communications.

1.2.2 Definitions

1.2.2.1 Contractor-Generated Wastes

Contractor-generated wastes shall include all materials which become contaminated as a result of Contractor activity at the site after the commencement of contract work.

1.2.2.2 Government-Generated Wastes

Government-generated wastes shall include all contaminated materials existing at the site prior to the commencement of contract work.

1.2.2.3 Confirmation Sampling

Confirmation sampling shall include all sampling conducted in the open excavations during the post-removal stage to confirm the removal of all contaminated soil to the specific cleanup level.

1.2.2.4 Verification Sampling

Verification sampling shall be performed at a minimum of 20 percent for explosive compounds and 10

percent of all other analytes of the confirmation samples and shall consist of split samples analyzed for the complete compound list as specified. Verification samples shall be performed at an approved independent analytical laboratory. Verification samples shall undergo data validation in accordance with EPA Functional Guidelines.

1.3 CHEMISTRY REQUIREMENTS

NOTE: Tables and charts defining Design Analysis (DA), Record of Decision (ROD), and remedial technology specific chemistry are required in the specifications and should be in accordance with or consistent with EM 200-1.3 requirements of USACE, CEMRD/MCX.

The designer may include chemistry elements in other sections of the specification; however, all elements of chemical data quality control required by this guide specification must be included in that section or the chemistry must also be included in this section of the specification.

1.3.1 Site History

NOTE: Provide a sufficient site history for the Contractor to meet the information requirements of the Sampling and Analysis Plan (SAP). The information in the Contractor's SAP must provide field and laboratory personnel all necessary site specific chemical data. Include references containing this information.

The former LOOW Site is located within the towns of Lewiston and Porter in Niagara County, New York (Figure 01450-1). The site is located approximately 10 miles north of the City of Niagara Falls, NY.

The original site encompassed approximately 7,500 acres with actual Department of Defense (DOD) site activities having occurred on 2,500 acres. During the early 1940s, the LOOW site was used as a manufacturing plant producing TNT for World War II. Once completed, the complex contained a power plant, hospital, fire department, a water supply system adequate for a city of 100,000, and water supply and wastewater treatment system of underground water, sewage, acid, and TNT waste pipelines.

The manufacturing portion of the plant was situated in the central southwestern section of the LOOW site, south of Balmer Road (Figure 01450-2). Wastewater from the TNT manufacturing operation, as well as stormwater and sanitary sewage, was transferred through an underground sewer network to a wastewater treatment plant located in the western portion of the TNT plant. The TNT waste pipelines ran in one pair of east-west trending lines across the TNT production area before being routed south to the wastewater treatment plant at the west end of the production line.

An overestimation by the Army of the need for TNT during World War II resulted in the closure of the TNT plant in July 1943 after only 9 months of operation. Following the decommissioning of the TNT plant, the majority of the LOOW facility was sold to private citizens with the government retaining the former active 2,500-acre portion of the site.

Portions of the LOOW site have since been used by several branches of the DOD and Department of Energy (DOE) for various manufacturing and storage activities, including the pilot production of high-energy fuels. In 1955, the Navy and Air Force acquired 360 and 200 acres, respectively, of the former TNT plant. The acquisition of the properties by the Navy and the Air Force was for the joint development of a boron- and lithium-based high-energy rocket fuel production plant. The Air Force subsequently assumed responsibility for the project, which was identified as Air Force Plant 68 (AFP-

68). Part of the construction of AFP-68 involved tying in the AFP-68 sanitary, stormwater, and chemical waste sewer systems into the former TNT wastewater treatment plant located approximately 1,000 ft southwest of AFP-68. AFP-68 was decommissioned in 1959 while still in pilot plant status.

In 1969, Chem-Trol Pollution Services, Inc. acquired portions of the LOOW for the development of a hazardous waste treatment, storage, and disposal (TSD) facility. Chem-Trol was acquired by SCA Chemical Services, Inc. (SCA) in 1973, and was subsequently acquired by Chemical Waste Management (CWM) in the early 1980s. In 1972, the Somerset Group obtained an approximate 100-acre section of the former LOOW property that contained AFP-68. Around 1979, the southern half of the former AFP-68 (about 50 acres) was sold to SCA. This section is presently owned by CWM. The portions of the former TNT and AFP-68 sites specifically addressed by this SAP are situated on property currently owned by CWM and the Town of Lewiston. CWM operates the site as a Resource Conservation and Recovery Act (RCRA) TSD facility. The portion of the site owned by the Town of Lewiston is currently unused.

Area specific analytical data which provides the contaminants detected, concentration ranges, media in which found and locations within the area are provide as attachments to the following sections:

Section 02228 Flushing and Closure In-Place of TNT Pipeline.

Section 02142 Remediation of Chemical Waste Sewers and Lift Stations.

Previous investigations have shown the presence of a variety of contaminants in varying concentrations. The classes of chemicals that may be present at the LOOW site include volatile organic solvents, nitroaromatics, heavy metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mineral acids, caustics, fuel oils and gasoline, and asbestos.

1.3.1.1 List of Available Documents

Further information available from the following site documents that are available for review by request at the USACE, Baltimore District, City Crescent Building, 10 South Howard Street, Baltimore, MD. Requests can be made through Justina Wesley at (410) 962-6734.

- Safety, Health and Emergency Response Plan date April 1988.
- Remedial Investigation Report dated August 1990.
- Advanced Feasibility Study Report dated September 1990.
- Site Safety and Health Plan date September 1991.
- Sampling and Analysis Plan dated December 1992.
- Preliminary Contamination Assessment Report dated December 1992.
- Hydrogeologic Characterization Update dated June 1993.
- Engineering Evaluation/Cost Analysis dated March 1995.
- Final Sampling and Analysis Plan and Site Safety and Health Plan dated October 1996.
- Final PRDI Report dated May 1997.

- Design Analysis Report - Supplement to 60% Design dated January 1998 (includes Draft Asbestos Survey Report as Appendix F).

1.3.2 Data Quality Objectives (DQOs)

NOTE: It is the responsibility of the designer to identify and define chemical parameter measurement Data Quality Objectives (DQOs) in the construction specification either as previously determined in the DA, ROD, other decision documents or developed in accordance with EPA 540/R-93-071 to comply with project specific Applicable or Relevant And Appropriate Requirements (ARARs). In the Tables in paragraphs Sample and Measurement Requirements and Methodology below, provide the contract required precision, accuracy, representativeness, comparability and completeness, and method required detection limits for analytical determinations.

Data quality objectives (DQOs) developed for the Interim Response Action (IRA) at LOOW shall be implemented to ensure that the data generated are of a known and suitable level of quality. The DQOs for the IRA are listed in Table 01450-1. The Contractor shall prepare the SAP that shall include sampling rationale, quantities, locations, and methodologies.

To ensure that the data generated are of a known and acceptable level of quality, the Contractor's SAP shall establish or make provisions for the following:

- Development of standards for performance related to various elements of the SAP.
- Monitoring of actual performance in comparison to and in compliance with the established standards.
- Reporting of the monitored performance.
- Rectifying of performance not conforming to the established standards.

Data quality criteria, which are elements of the DQOs, are described in terms of the following:

- Accuracy - The degree of agreement of a measurement with the true or expected concentration. When applied to a set of observed values, accuracy will be a combination of a random component and a systematic error (or bias) component.
- Precision - A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of relative percent difference between duplicate measurements or relative standard deviation among three or more measurements. Various measures of precision exist depending upon the prescribed similar conditions.
- Representativeness - Expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.
- Comparability - Expresses the confidence with which one data set can be compared to another.

- Completeness - A measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained.

The means of measurement and the percentage numerical limits to use for precision, accuracy, and completeness shall be provide in the Contractor's SAP.

To achieve the DQOs, the Contractor shall implement QA measures throughout the project to ensure that the data have known and suitable quality characteristics, such as accuracy, precision, representativeness, comparability, and completeness. The Contractor shall ensure the sampling data is quality-controlled through collection of field QC samples and calibration of laboratory equipment following standard SW-846 methods. The Contractor shall implement the QA/QC measures to achieve the DQOs in order to limit the chance of inadequate or incomplete data.

Sample acquisitions, chemical analyses and chemical parameter measurements shall be performed in such a manner that the resulting data meets and supports data use requirements. The chemical data shall be acquired, documented, verified and reported in a manner that assures that the specified precision, accuracy, representativeness, comparability and completeness requirements are achieved. Contract-required development of DQOs shall be in accordance with EPA-540/R-93-071, EPA-450/4-89-015 and EPA-450/4-90-005.

1.3.3 Sample and Measurement Requirements

~~NOTE: Requirements for chemical measurement site activities must be addressed. For National Priority List (NPL) Sites, chemical data requirements for delisting the site from the NPL must be defined and included. The designer should provide tables in the CHEMISTRY REQUIREMENTS paragraphs which are consistent with those provided by CEMRD/MCX so that the Contractor can make a smooth transition of the tables into the contract required SAP.~~

~~The designer should provide tables which assign unique sampling location and matrix identifications in the Sample and Measurement Requirements and Methodology paragraphs which enable all samples required to be cross referenced.~~

1.3.3.1 Soil and Water Samples

~~NOTE: Provide a site drawing which depicts sampling locations and assigns a unique identification number (ID) to each sampling point; and a Table which includes the location ID, states the DQO for the measurement, and defines all non-process soil and water samples required.~~

Samples for non-process soil and water are required according to the following: ☐.

- Confirmation, Verification, and Post IRA Sampling - see Section 02010 for sampling requirements.
- Potentially contaminated contact waters including stormwater, groundwater, and seepage into excavations - see Section 02141: DEWATERING LIQUIDS AND HANDLING.
- Waste characterization testing as required by the accepting treatment/disposal facility.

1.3.3.2 Borrow Material, IDW and Manifesting

NOTE: Provide the required or optional borrow material, Investigation Derived Waste (IDW) and shipping manifesting sample requirements, and include in descriptive or Table form.

Samples shall be required for on or offsite borrow material Investigation Derived Wastes (IDW) and for material shipping manifesting in accordance with 40 CFR 261, 40 CFR 262, 40 CFR 268, 40 CFR 172, and 49 CFR 178, as depicted in the following tables [____]. Sampling requirements for off-site and on-site excavated materials for use as backfilled are provided in Section 02227: BACKFILL AND ROUGH GRADING FOR REMEDIATION AREAS 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS GRADING. It is the responsibility of the Contractor to perform sampling and analysis of Contractor- and Government-derived waste for transport, treatment and/or disposal as required under the applicable regulations and the accepting treatment/disposal facility.

1.3.3.3 Process Solid and Liquid Samples

NOTE: Provide a generic or project specific drawing which depicts sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQOs for the measurement, and defines process solid and liquid samples required.

Samples for process solids and liquids are required according to the following: [____].

1.3.3.4 Process and Emissions Gas and Particulate Samples

NOTE: Provide a generic or project specific drawing which depicts sampling or instrumental measurement locations and assigns a unique ID to each sampling or measurement point; and a table which includes the location ID, states the DQOs for the measurement, and defines process and emission gas and particulate sample requirements.

Samples for process and emissions gas and particulate matter are required according to the following: [____].

1.3.3.5 Chemical Parameter Instrumental Measurement

NOTE: Provide site and/or process drawing which depicts instrumental sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQO for the measurement, and defines chemical parameters being measured by instrumental means.

Instrumental chemical parameter measurements shall be performed for the chemical parameters according to the following: [____].

1.3.3.6 Fenceline and Offsite Air Monitoring

NOTE: Provide a site and immediate surrounding drawing which depicts the actual and potential air sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQO for the measurement, and defines fenceline and ambient air sample and measurements required.

Samples for fenceline and offsite ambient air and meteorology are required according to the following: [____].

1.3.4 Methodology

NOTE: Define sample analytical methods and the required detection limits. Analytical method requirements for all project chemical measurements must be addressed, including samples collected and instrumental measurements.

For each method, provide a table which identifies sample location, the location ID, number of samples (including QC and QA samples), analytical method, and detection limits.

1.3.4.1 Non-process Soil and Water Sample Methods

Non-process soil and water samples shall be analyzed and/or shipped to a government lab according to the following sections: table: []:

- Confirmation and Verification Sampling - see Section 02010 for sampling requirements.
- Potentially contaminated contact waters including stormwater, groundwater, and seepage into excavations - see Section 02141: DEWATERING LIQUIDS AND HANDLING
- Waste characterization testing as required by the accepting treatment/disposal facility.

1.3.4.2 Borrow Material, IDW, and Manifesting Sample Methods

Borrow or fill material, IDW and manifesting samples shall be analyzed according to Section 02227: BACKFILL AND ROUGH GRADING FOR REMEDIATION AREAS-02210: BACKFILL AND GRADING FOR REMEDIATION AREAS. The Contractor shall conduct analysis of Contractor- and Government-derived waste for transport, treatment and/or disposal as required under the applicable local, state, and federal regulations, and by the accepting treatment/disposal facility. the following table: []:

1.3.4.3 Process Solid and Liquid Sample Methods:

Process solid and liquid samples shall be analyzed and/or shipped to a government lab according to the following table: []:

1.3.4.4 Process Gas and Particulate Emission Sample Methods

Process and emission gas and particulate matter samples shall be analyzed and/or shipped to a government lab according to the following table: []:

1.3.4.5 Instrumental Measurement Methods

Instrumental measurements shall be performed for chemical parameter according to the following table: []:

1.3.4.6 Fenceline and Offsite Air Monitoring Measurement Methods

Fenceline and offsite air samples shall be analyzed according to the following table: []:

1.4 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate chemical data quality control. The magnitude of the project, remedial technology and submittals necessary for Government QA control will be the prime factors in determining which submittals listed below are required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-01 Data

Chemical Quality Control Plan; GA.

The CQC Plan, no later than [] 30 days after receipt of Notice to Proceed, and coincident with or included in the CQC Plan required in Section 01440 CONTRACTOR QUALITY CONTROL.

Sampling and Analysis Plan; GA.

The SAP, for review, no later than [] 60 days after acceptance of the CQCP.

Interim Sampling and Analysis Plan; GA.

The ISAP shall be provided at the coordination meeting and prior to any SAP.

SD-09 reports

Daily Chemical Quality Control Reports; FIO.

The DCQCR, as a separate report, within [] 2 days of the daily activity.
Chemical Quality Control Summary Reports; GA.

The CQCSR, within [] 2 weeks of project completion, prior to final payment.

Chemical Data Interim Report; FIO.

~~The CDIR shall be provided to the government QA Lab each [] [days] [weeks] of the project.~~

1.5 PAYMENT

NOTE: For some remedial action contracts chemical parameter measurement may be acquired by both lump sum pricing and additional unit pricing. Unless adequately addressed in the Special Clauses Section of the contract, make clear what chemical measurement pricing procedures are to be used for the contract and that payment will be withheld pending GA of the CQCSR.

Separate payment will not be made for providing and maintaining the chemical data quality requirements including the chemical data quality management, chemical data validation, minimum chemical data reporting requirements, and the deliverance of the chemical data quality submittal requirements; these costs shall be included in the applicable unit prices or lump sum prices contained in the bidding schedule.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for chemical sample acquisition, sample analysis, instrumental measurements of chemical parameters and for chemical data quality control. An effective chemical data quality control system shall be established that meets the requirements for the chemical measurement DQOs applicable to the project. The chemical data quality control system shall consist of a Chemical Quality Management staff responsible for the sampling and measurement plans, analytical procedures, minimum data reporting requirements, and the organization necessary to produce the required chemical data. The system shall cover chemical measurements pertaining to and required for Contractor and subcontractor produced chemical data.

3.2 CHEMICAL QUALITY CONTROL PLAN

3.2.1 General

The CQC Plan (this can be incorporated into the Contractor's Quality Control Plan that has the same designation-CQC Plan) shall identify personnel, qualifications and procedures for implementing a chemical data quality control system for Contractor and subcontractor. The plan shall include analytical capability and procedures; SAP responsibility; a corporate verification letter from management committing the assigned personnel to the project; and an organizational chart including DQO and submittal responsibilities and sequence for chemical data quality verification. Chemical measurements including sampling and/or chemical parameter measurement will not be permitted to begin until after acceptance of the CQC Plan and production, and government approval of a Sampling and Analysis Plan (SAP). Chemical measurements for the initial phases of the contract may be allowed by the USACE CO through an Interim Sampling and Analysis Plan (ISAP), following acceptance of the CQC Plan. The measurement of chemical parameter, which is not included in a government approved ISAP and is not included in the contract specification, will not be permitted.

3.2.2 Contents of CQC Plan

~~NOTE: Define the chemical data quality control management and staff requirements that assure compliance with project chemical data requirements. The level of chemical measurement expertise and project commitment must be relevant to the magnitude of the project chemistry requirements.~~

The CQC Plan shall include, as a minimum, the following, to cover contract related chemical measurements by the Contractor and all subcontractors.

3.2.2.1 Qualifications

The CQC Plan shall include names, education, experience qualifications, authorities, and decision-making responsibilities of all chemical quality management and support personnel. The CQC Plan shall contain a copy of a letter from the project QC manager designating and authorizing a Chemical Data Quality Manager and the Chemical Data Quality Control Organization Staff.

3.2.2.2 Authority and Responsibility

The CQC Plan shall include a diagram, flow chart, or figure clearly depicting the chemical data quality management and support staff and the authority and responsibility of each for chemical sampling and analysis, procedures for corrective actions, deliverables and submittals, deviations and changes, chemical quality documentation, data validation, minimum data reporting requirements, and DQOs for chemical parameter measurement by the Contractor and subcontractors. The contents of this section of the CQC Plan shall be included in the applicable "Project Organization" elements of the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPP). Coordination and QA oversight of field laboratories, if used, shall be defined. Coordination with the Independent Laboratory of QA split verification sampling shall be defined.

3.2.2.3 Minimum Personnel Qualifications

~~NOTE: Insert the required personnel and their desired minimum educational and/or related experience required for the authoritative and decision making responsibilities which comprise the Chemical Quality Control Organization. Experience/education requirements must correspond to chemical data responsibilities assigned in the CQC Plan. Assign personnel requirements appropriate to the magnitude of the remedial action. As a minimum, HTRW remedial action projects requiring chemical measurements must have a designated chemical quality control officer within the CQC system.~~

The Contractor's Chemical Quality Control Officer shall have, as a minimum, a BS degree in Chemistry, and a minimum of 5 years of experience with HTRW Chemical Quality Control including responsibilities for HTRW DQO definitions, HTRW sampling and analysis, HTRW project requirements for data documentation and validation, and final HTRW project reports.

3.2.3 Acceptance of Plan

Acceptance of the CQC Plan is required prior to the submission of the Contractor's SAP or ISAP and prior to the performance of chemical data related activities. Acceptance is conditional and will be predicated on satisfactory performance during the remedial action. The government reserves the right to require the Contractor to make changes in the CQC Plan (including personnel changes as necessary), to achieve the chemical data quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contracting Officer shall be notified by the Contractor in writing a minimum of 5 calendar days prior to making any proposed change or within 2 days of making any unavoidable changes. Changes that include personnel changes, authoritative changes, responsibility changes, subcontractor changes pertaining to chemical data quality, etc. are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

~~NOTE: Quality Assurance (QA), to monitor the quality of Contractor work, for this government contract is a function of the government. For chemical data quality control, USACE has established QA policy which is defined in ER 1110 1 263. The designer must require in the specification that the Contractor comply with USACE QA as described in ER 1110 1 263 unless not project required. Require the Contractor to be knowledgeable of ER 1110 1 263 and be prepared to discuss at the Coordination Meeting.~~

After the Preconstruction Conference, before start of construction which involves any chemical parameter measurement, and prior to acceptance by the government of the CQC Plan, a coordination meeting will be held including the Contractor and the Contracting Officer or authorized representative to discuss the CQC Plan. The coordination meeting, when possible, will be simultaneous to any CQC coordination meeting required in Section 01440 CONSTRUCTION QUALITY CONTROL. A list of definable features which involve chemical measurements shall be agreed upon. At a minimum, each matrix (soil, water, air, containerized wastes, ~~radioactive wastes~~, instrumental chemical parameter measurement, etc.) is a definable work feature. The meeting will affect the development and management of the chemical data quality system which shall include project DQOs, project submittals, chemical data documentation, chemical data validation, chemical data produced/acquired by subcontracting, required sampling and analysis protocols, total matrix and parameter sampling requirements, and minimum data reporting requirements. The meeting will serve to establish an interrelationship between the Contractor's chemical data quality management and government personnel responsible for Chemical Quality Assurance requirements. Minutes of the meeting will be documented by the government and signed by both the Contractor and the Contracting Officer. The minutes will include any or all unresolved chemical issues along with the conditions for resolution and will become a part of the contract file. Subsequent conferences may be called to address chemical quality issues by either party, to reconvey mutual understandings and resolve issues and/or address deficiencies or changes in the Chemical quality control system or procedures which may require corrective actions or agreements by the Contractor.

3.4 SAMPLING AND ANALYSIS PLAN

3.4.1 General

~~NOTE: The SAP may be required to be a single stand alone document or a two part document to be used by the sampling and measurement personnel as well as Contractor or subcontractor analytical laboratory personnel. Sufficient project chemical data requirements, to the extent the design allows, must be included in paragraph CHEMISTRY REQUIREMENTS for the Contractor to prepare each of the elements of the SAP. The SAP must be provided to all Contractor and subcontractor personnel responsible for chemical parameter measurements. The QAPP portion of the SAP must be provided to Contractor's analytical laboratories and subcontracted laboratories.~~

The designer must require the Contractor to prepare the SAP in accordance with requirements of USACE, CEMRD/MCX, consistent with project specific chemical data quality requirements or according to ER 1110 1 263. Preparation of the SAP may include a single document which cross references sections of the FSP and QAPP for smaller projects and which must be made available to both field and laboratory personnel. For larger projects requiring an extensive SAP, it may be more user friendly to make the FSP independent of the QAPP. In such case

~~the two must not cross reference but must be stand alone parts of the SAP. The designer must designate which is required by the contract.~~

The Sampling and Analysis Plan (SAP) shall be a [single] ~~{two part}~~ document which contains two distinct elements: Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP). Sections of the FSP and QAPP [may] ~~{may not}~~ be cross referenced. The SAP shall confirm the Contractor's understanding of the government's requirements for chemical data quality control for the contract, and shall provide direction to personnel responsible for field sampling and sample submittal for analysis, field chemical parameter measurement, data documentation, data validation and data reporting requirements. As a single interrelated document, the SAP shall be provided to field and laboratory personnel. The SAP shall describe all chemical parameter measurements for all matrices for all phases of the remediation contract. In preparing the SAP, the Contractor may deviate from paragraph CHEMISTRY REQUIREMENTS to propose original/innovative approaches to chemical parameter measurements for cost reduction and remediation efficiency by abbreviated sampling, contingency sampling and/or contingency analysis, indicator or tracer analysis, onsite analytical services, equivalency or screening methods, etc. if the chemical data quality requirements are met, and if there is no conflict with the Government QA policy.

3.4.2 Contents of Field Sampling Plan

The FSP shall contain necessary technical detail and direction for the field personnel to understand sampling and field measurement requirements. The FSP shall contain sufficient direction and detail for onsite personnel to perform all onsite activities required to attain project DQOs, including: collection of samples for onsite and offsite chemical analysis, shipment of samples for offsite analyses, and performance of onsite and offsite instrumental parameter measurements, data documentation and reporting requirements. The FSP shall have a Title Page including the site specific project name, location and remedial process technology, followed by a Table of Contents and the following:

3.4.2.1 Project Description

The Project Description section of the FSP shall contain, as a minimum, the following:

- a. Site History and Contaminants. This section shall provide a brief site description including history/background which serves to orientate users of the FSP as to what site specific chemical contaminants and parameters are involved in the project.
- b. Summary of Existing Site Data. This section shall summarize any existing chemical data from previous site projects such as Preliminary Assessment/Site Investigation (PA/SI), Remedial Investigation/Feasibility Study (RI/FS), DA, etc., which depicts the media involved in contamination, the class/types of contaminants detected, the relative concentrations of the site specific contaminants and a general summary of the quality of the existing data.
- c. Site Specific Sampling and Analysis Problems. This section shall include established matrix interference, sample acquisition, homogenization, shipment problems, etc. References supporting the site data shall be included in the Reference Section of the FSP.

3.4.2.2 Project Organization and Responsibilities

~~NOTE: Require the Contractor to clearly define key personnel responsible for onsite chemical parameter measurements, sample acquisition, and sample shipment including USACE, other government/regulatory and subcontractor personnel regardless of project size.~~

~~*****~~

The Project Organization and Responsibility Section of the FSP shall contain, as a minimum, an organization chart depicting the following:

- a. Summary of Key Personnel. This section shall include a brief summary of Contractor management personnel included in the CQCP along with key project personnel involved with onsite sample acquisition and delivery, onsite chemical parameter measurements, onsite data documentation and reporting, and corrective actions.
- b. Points of Contact. This section shall include, to the extent possible, key government, regulatory, Contractor and subcontractor personnel along with their location, address, phone number and organization affiliation. This section shall identify the contact person for guidance and decision authority regarding chemical measurements and sampling.
- c. Personnel qualification requirements for field personnel responsible for instrumental measurements, and sample acquisition and shipment.

3.4.2.3 Scope and Objectives

The Scope and Objectives Section of the FSP shall contain, as a minimum, a summary of the contaminated media to be remediated, the target contaminants of concern, the remediation technology, the type of matrix and chemical parameters of concern and the DQOs required to support the intended use of the chemical data for the following matrices:

- a. Solid Materials. This section shall include solid materials such as soils, sludges, process solids, treated soils, borrow materials, and material for offsite transportation and disposal.
- b. Liquid Materials. This section shall include liquid media such as groundwater, surface water, process streams liquids, process discharges, and liquids for offsite transportation and disposal.
- c. Gas Phase Materials. This section shall include air media such as process flows, point source emissions, and perimeter or offsite air samples to be sampled.

3.4.2.4 Field Activities

The Field Activities Section of the FSP shall contain, as a minimum, diagrams, charts, tables, etc., depicting the following:

- a. For non-process solid and liquid samples, ~~a site drawing grid maps~~ which depicts ~~planned~~ sampling locations and assigns a unique identification number (ID) to each sampling point; and a table which includes the location ID, states the DQO for the measurement, and includes duplicates, splits, blanks, rinsates, ~~government~~ QA samples, etc.
- b. For borrow material, ~~Investigation Derived Waste (IDW)~~ and shipping manifesting sample requirements, and charts or tables defining the required samples.

- c. ~~For solid and liquid process samples, a drawing which depicts sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQOs for the measurement, and includes duplicates, splits, blanks, rinsates, government QA samples, etc.~~
- d. ~~For process and emission gas and particulate samples, a drawing which depicts sampling or instrumental measurement locations and assigns a unique ID to each sampling or measurement point; and a table which includes the location ID, states the DQOs for the measurement, and includes the measurement principal, calibration requirements and frequency, instrument performance specification requirements, audit checks, etc.~~
- e. ~~For instrumental measurements not previously included, a site and process drawing which depicts instrumental sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQO for the measurement, and includes the measurement principal, measurement frequency, calibration requirements and frequency, instrument performance specification requirements, audit checks, etc.~~
- f. ~~For fence-line and offsite ambient air sampling, a site and immediate surrounding area drawing which depicts the actual and potential air sampling locations and assigns a unique ID to each sampling point; and a table which includes the location ID, states the DQO for the measurement, and includes the measurement principal, collection frequency, government and QC sample requirements, and defines the measurement basis as required or contingent, etc.~~
- gc. For samples required but for which the sampling locations are not known, a table identifying chemical parameter measurements, such as clean-up confirmation, offsite air monitoring, offsite borrow material, etc., if not included previously.
- hd. For non-standard procedures including field screening methods, equivalent methods, modified methods and procedures, etc, a table identifying the measurement principal, the measurement DQO, and details necessary to achieve the measurement DQO.
- ie. Copies of Contractor SOPs for the above instrumental chemical measurement and sample acquisition procedures.

3.4.2.5 Sample Chain of Custody/Documentation

The Sample Chain of Custody/Documentation Section of the FSP shall contain, as a minimum, the following:

- a. COC forms to be used on the project. COC forms shall include as a minimum: the unique sample number, time and date acquired, sampler's name, analysis to be performed, matrix type, and any special instructions. The COC shall be signed by the senior onsite Chemist or Contractor Representative designated in the Project Responsibilities section of the FSP.

3.4.2.6 Sample Packaging and Shipping

The Sample Packaging and Shipping section of the FSP shall contain, as a minimum, the following:

- a. Sample labeling, packaging and shipping, including the SOPs for sample labeling (including examples of label), sample packaging, sample cooling, shipping procedures and procedures for corrective actions. The sample integrity shall be established and

maintained throughout the custody process.

- b. Shipping Companies, including the shipping companies that will be used to ship the project and government QA samples, including address, phone number, and hours available for sample pick up or delivery.
- c. Shipping Destinations, including the shipping addresses for project chemistry labs, the ~~government-independent~~ QA Lab and other ~~regulatory project~~ labs. This section shall specify points of contact for chemistry labs required for the project and include phone number and address. This section shall include any prenotification time requirements for sample shipment and the receiving hours of the QA Lab.
- d. Sample Identification Table shall identify samples and relate the project samples to the ~~Government~~ QA samples.

3.4.2.7 Chemical Quality Control

The Chemical Quality Control section of the FSP shall contain, as a minimum, necessary details enabling the field personnel to implement the three-phase control procedures required for chemical parameter measurement and sample acquisition and shipment. The details shall define the activities and responsibilities for the preparatory, initial and follow-up phases in accordance with paragraph CONTROL OF CHEMICAL DATA QUALITY.

3.4.2.8 Daily Chemical Quality Control Reports

The DCQCR Section of the FSP shall contain, as a minimum, the elements specified in paragraph Contents of the DCQCR.

3.4.2.9 Corrective Actions

The Corrective Actions section of the FSP shall contain, as a minimum, personnel responsible for project DQO monitoring, and points of contact for corrective actions for such discrepancies as sampling procedures, instrument calibration procedures, performance specification requirements, sample shipping and receiving, data check failures, data reporting, evaluation failures, and verification of corrective action implementation.

3.4.2.10 Project Schedule

The Project Schedule section of the FSP shall contain, as a minimum, schedules for the three-phase quality control process; submittals; and chemical parameter measurements and sampling requirements for the preprocess, process and closure or post remediation phases.

3.4.2.11 Sample Apparatus and Field Instrumentation

The Sample Apparatus and Field Instrumentation section of the FSP shall contain, as a minimum, a list of sampling equipment, apparatus, instruments, containers, supplies, standard forms and labels, and chemical reagents to be taken to the site. When applicable, equipment name, model, serial number, calibration equipment requirements, audit material requirements, and total number of each shall be provided.

3.4.2.12 Appendices

The Appendices section of the FSP shall contain, as a minimum, Contractor standard forms and SOPs which are referenced but not included previously, and standard measurement methods, guidance documents, etc.

3.4.3 Quality Assurance Project Plan

The QAPP shall contain necessary technical detail and direction for laboratory personnel to understand project sample analysis, quality control and data reporting requirements, analytical methods, required detection limits, QC requirements, and data validation and reporting requirements. The QAPP shall have a Title Page, including the site specific project name, location, and remedial process technology, followed by a Table of Contents and the following:

3.4.3.1 ~~Project Description~~

~~The Project Description shall contain, as a minimum, the following:~~

- ~~a. Site History and Contaminants which shall contain, from paragraph CHEMISTRY REQUIREMENTS, a brief site description including history/background, which serves to orientate users of the QAPP as to what site specific chemical contaminants and their approximate concentrations are in the project.~~
- ~~b. Existing Site Data Summary which shall contain significant existing chemical data from previous site projects such as PA/SI, RI/FS, etc., as well as a brief summary of the types of samples that will be generated for this project.~~
- ~~c. Site Specific Analysis Problems which shall contain any previous sample and matrix problems that resulted in laboratory analytical difficulties, as well as any similar analytical problems known to be unique to the remedial process.~~
- ~~d. Required chemistry which shall identify any data required for removing remediated site from the NPL List, when applicable.~~

3.4.3.2 Project Organization and Responsibilities.

NOTE: Include minimum requirements for key analytical personnel appropriate for the project. Specify that analytical personnel requirements, unless otherwise stated, shall be according to ER 1110-1-263.

The Project Organization and Responsibilities section of the QAPP shall contain, as a minimum, an organizational chart depicting the following:

- a. Summary of Personnel including a brief summary of key Contractor management personnel included in the COCP along with key laboratory personnel involved with sample analysis, project DQOs, documentation, corrective action procedures, data validation and reporting requirements. To the extent possible, key personnel of subcontractor organizations are required.
- b. Key government project management and regulatory personnel as well as Contractor and subcontracted laboratory with their location, address, phone number, and organization. This

section shall identify the contact person for sample receipt problems, data reporting problems, guidance, and decision authority, etc.

- c. Personnel qualification requirements which specify minimum requirements for analytical laboratory personnel such as organic and inorganic supervisors, laboratory Quality Assurance (QA) officers, etc.

3.4.3.32 Data Quality Objectives

The DQO Section of the QAPP shall contain, as a minimum, a definition of each chemical sample analysis, and shall define to the analytical laboratories the final uses of the analytical data for all samples submitted. Contractor developed DQOs address the following:

- a. Precision
- b. Accuracy
- c. Representativeness
- d. Comparability
- e. Completeness
- f. Method Sensitivity
- g. Documentation
- h. Data Validation and
- i. Data Reporting.

~~3.4.3.4 Sample Locations and Procedures~~

~~The Sample Location and Procedures section of the QAPP shall identify samples that will be collected from locations where previous analytical problems have been verified, and process collection points which have known analytical problems for a specific remedial technology.~~

3.4.3.53 Sample Custody and Holding Times

The Sample Custody and Holding Times section of the QAPP shall contain, as a minimum, the following:

- a. A copy of a generic sample receipt form that shall be completed for each shipping container received and shall include as a minimum: the unique sample number, time and date acquired, sampler's name, preservative check, cooler temperature, analysis to be performed, matrix type, method holding time, and any special instructions.
- b. The SOP for intra laboratory chain of custody requirements for samples received and subsequently forwarded to another lab.
- c. Requirements for inter-laboratory sample custody and traceability, including standards, spiking, witness and analyst initialling, etc.

3.4.3.64 Analytical Procedures

The Analytical Procedures section of the QAPP shall contain, as a minimum, a table depicting the project samples; collection point ID; QC samples; analytical method; a description of nonstandard methods including chemical parameter or analyte list, equivalency data, detection limits, precision, accuracy, and the reference method replaced when applicable (Nonstandard methods shall have the analytical laboratory's established and written SOPs); and required detection limits for each analysis of material such as:

- a. Soils, sludges, ~~process solids, treated soils,~~ borrow materials, material for offsite transportation and disposal, etc.
- b. Liquid media such as groundwater, surface water, ~~process streams water,~~ etc.
- c. ~~Point source emissions and perimeter or offsite air samples, etc.~~

Chemical analysis of water and soil samples shall be in accordance with SW-846 methods. Detection limits shall be in accordance with SW-846 unless otherwise specified. Detection limits shall be below any applicable NYSDEC cleanup criteria or applicable stormwater discharge permit requirements.

3.4.3.75 Calibration Procedures and Frequency

The Calibration Procedures and Frequency section of the QAPP shall contain, as a minimum, the calibration procedures, calibration schedules, detection limit and retention time window files, performance acceptance criteria, and calibration verifications for each analytical procedure required.

3.4.3.86 Internal QC Checks

The Internal QC Checks section of the QAPP shall contain, as a minimum, batch definition, continuing calibration verifications, blanks, audits, surrogate and spike recovery criteria, internal standards, government and intra-laboratory studies, matrix and duplicate matrix spike results, standard reference material and traceability, monitor or instrument audits, and performance audit sample results.

3.4.3.97 Calculation of Data Quality Indicators

The Calculation of Data Quality Indicators section of the QAPP shall contain, as a minimum; the calculations used to determine detection limits and standard deviation of replicate analysis; accuracy from matrix spikes or standard reference materials; precision from duplicate analysis; standard deviation from triplicate analysis; and completeness based on the number of measurements judged valid and the total number of measurements required.

3.4.3.108 Corrective Actions

The Corrective Actions section of the QAPP shall contain, as a minimum, the following:

- a. The corrective action criteria for sample receipt problems, sample holding times, analytical QC problems, and the contingency plans for each implemented corrective action.
- b. Personnel points of contacts for persons responsible for corrective action reporting, implementation, and documentation consistent with the organizational chart responsibilities.

3.4.3.119 Data Reduction, Validation and Reporting

The Data Reduction, Validation and Reporting section of the QAPP shall contain, as a minimum, the following:

- a. Data Reduction including data reduction procedures, the methods or equations of concentration calculations, reporting units of concentrations, treatment of blank data, significant figures, moisture related data, and the procedure for calculating precision and accuracy.
- b. Internal laboratory and independent party Data Validation including data validation procedures used for laboratory chemical data, flagging and data qualifying procedures, required levels of validation, and the responsible personnel for each analytical lab and data validation confirmation by successive lines of review as assigned in QAPP organization. Data validation will be conducted according to the EPA National Functional Guidelines, using any existing EPA Region II modifications to the National Functional Guidelines. Data validation per EPA National Functional Guidelines will be required for the QA verification samples collected. A chemical data package containing all the required data deliverable items will need to be provided to the selected independent chemical data validator.
- c. Internal laboratory and independent party Data Reporting including chemical data flow, analysis and reporting turnaround times, minimum data reporting requirements, destinations and delivery times for each report.
- d. Project specific reporting requirements including CDIRs frequency, the minimum data reporting requirements to the government QA Lab, specific data and time requirements for each lab, and data report destination point.

3.4.3.1210 Preventative Maintenance

The Preventative Maintenance section of the QAPP shall contain, as a minimum, the preventative

maintenance plan to be implemented by each onsite and offsite laboratory to minimize downtime of laboratory instruments.

3.4.3.13 Performance and System Audits

The Performance and System Audits section of the QAPP shall contain, as a minimum, lab validation audits, method required audits, regulatory required audits, etc. for each onsite and offsite chemical analytical laboratory.

3.4.3.14 QC Reports to Management

The QC Reports to Management section of the QAPP shall contain, as a minimum, the format for reporting an assessment of data accuracy, precision and completeness, personnel responsible for reporting, personnel receiving the reports, and the frequency of the reports.

3.4.3.15 Appendices

The Appendices section of the QAPP shall contain, as a minimum, standard forms, definitions, acronyms, and references pertaining to the project requirements included in the QAPP relating to project DQOs; standard and nonstandard measurement methods; equivalency data; US Government and regional agency guidance and regulatory documents; existing site related documents; other contract related chemical analysis documents, etc. SOPs required in the above elements may be included in the Appendices and referenced in the applicable element.

3.5 DAILY CHEMICAL QUALITY CONTROL REPORTS

~~NOTE: Require a separate DCQCR from the daily CQC report for projects involving a large amount of onsite chemical parameter measurement activities. Minimum amounts of such measurement activity can be included in the Contractor's daily CQC report.~~

3.5.1 General

The DCQCR shall be generated by onsite personnel responsible for chemical parameter measurement and chemical sample acquisition, and signed by the CQC Representative, to assure that chemical data resulting from these activities meets the contract documentation requirements.

3.5.2 Contents of the DCQCR

The DCQCR shall contain, as a minimum, the following:

- a. Job identification and Site numbers.
- b. Weather including temperature, wind speed and direction, barometric reading, significant wind changes, etc.
- c. Chemical Data acquisition work performed, including specific information identifying project and QA samples collected, and calibrations.
- d. Sampling and Sample shipments including shipment and delivery problems which may affect project DQO requirements.

- e. Chemical parameter measurement problems which may affect project DQO requirements, including instrument malfunction, performance requirement failure, etc.
- f. Any sampling performed as contingency sampling.
- g. Corrective Actions and/or deviations from the approved SAP, including approvals.
- h. Chemical quality control activities, as part of the three-phase control procedures that were implemented, and confirmation that deviations or actions jeopardizing project DQOs have been forwarded to project management. A summary of the feedback procedure for any corrective actions taken.
- i. Signatures of responsible authority and initials of all persons conducting changes/corrective actions.

3.6 CHEMICAL QUALITY CONTROL SUMMARY REPORT

3.6.1 General

A CQCSR shall be produced which includes a summary of all chemical parameter measurement activities after project completion. The summary in its broadest sense shall include an evaluation of the achievement of the required chemical DQOs.

3.6.2 Contents of the CQCSR

The CQCSR shall contain, as a minimum, the following:

- a. Summary of project scope and description.
- b. Summary of DCQCRs.
- c. Summary of deviations from the design chemical parameter measurement specifications.
- d. Summary of chemical parameter measurements performed as contingent measurements.
- e. Summary discussion of resulting data including achieving minimum data reporting requirements.
- f. Summary of achievement of project specific DQOs.
- g. Summary and description of Lessons Learned.
- h. Conclusion and Recommendations.

3.7 CHEMICAL DATA INTERIM REPORT

~~NOTE: Specify if periodic data reports are required to be submitted to USACE Project Manager or QA Lab and the frequency. This procedure allows USACE to evaluate the project lab's performance on a continuing basis. For remedial action contracts of a year or more duration,~~

~~or for a process prove out period of performance, the CDIR is mandatory; for short term remedial action efforts, the CDIR would be inapplicable.~~

~~*****~~

~~The Contractor is responsible for QA verification samples and analysis to be performed at an USACE certified laboratory. A CDIR is not required for this project since no QA government lab samples are anticipated.~~

3.7.1 — General

~~The CDIR shall be produced and provided through USACE management to the USACE Quality Assurance lab assigned to the project. The CDIR serves as part of the follow up phase of the quality control system mechanism. The government QA function will compare QA sample results to corresponding primary sample results and will assess the Contractor's compliance with the SAP and initiate corrective action as necessary.~~

3.7.2 — Contents of the Chemical Data Interim Report

~~The CDIR shall contain, as a minimum, the following:~~

- ~~a. — A summary of chemical samples acquired during the specified interim period including sample number, collection date, analytical parameter, shipment date, COC forms, laboratory receipt date, sample receipt forms, sample prep date and sample analysis date.~~
- ~~b. — A summary of corresponding QA samples acquired and sent to the lab including the collection dates and sample IDs. The summary shall include a table which relates project and QA samples.~~
- ~~c. — A summary of chemical analyses for the samples including the following laboratory QC procedures and results:~~
 - ~~(1) — Accuracies from surrogate spike recoveries, matrix spikes and spike duplicates and laboratory control samples;~~
 - ~~(2) — Precisions from matrix spikes and spike duplicates, field duplicates and laboratory duplicates;~~
 - ~~(3) — Blank results;~~
 - ~~(4) — Rinsate results and;~~
 - ~~(5) — Holding time discrepancies.~~
- ~~d. — A summary of analytical activities which result in deviations/or affects the PARCC project goals.~~
- ~~e. — Evidence that deviations were provided to management authority responsible for Chemical QC.~~
- ~~f. — Summary of corrective actions taken to correct deficiencies/deviations from contract requirements.~~

3.8 INTERIM SAMPLING AND ANALYSIS PLAN

~~NOTE: An Interim Sampling and Analysis Plan (ISAP) describing extremely well defined portions of chemical data acquisition is an option only if dictated by a unique project specific situation. Such efforts as background air sampling required to precede intrusive actions or additional unanticipated soil or water sampling can delay remedial action activities if not performed expediently. Identify the need for an ISAP and require it in the project specification if immediate chemical data activities are required prior to government approval of the contract required SAP. Specify that the Contracting Officer must direct the preparation and use of an ISAP. Include the chemical parameters to be measured under the ISAP and the DQOs, standard measurement methods, usage of existing USACE validated analytical laboratories and minimum data reporting requirements.~~

When directed to perform a limited amount of chemical parameter measurements by the CO, the ISAP shall be prepared and submitted for acceptance. ~~An ISAP is not anticipated for this project~~ The ISAP shall contain: well established SOPs for the sampling; EPA standard methods for analysis; the exact number of chemical samples to be acquired and analyzed; the turnaround time for each analytical result; the QA/QC samples and analyses; the data validation process; identification of USACE currently validated analytical laboratories; and reporting requirements including format and submittal time requirements and delivery points. Work performed under an ISAP shall be consistent with project required DQOs, and address only chemical parameters. Each definable work feature of the ISAP shall be conducted under the three-phase control mechanism described in paragraph CONTROL OF CHEMICAL DATA QUALITY.

3.9 CONTROL OF CHEMICAL DATA QUALITY

3.9.1 ~~General~~

General Contractor chemical data quality control shall assure that chemical parameter measurement data complies with the DQOs, ARARs, and the requirements of the SAP. The Contractor shall utilize the three-phase control system which includes a preparatory, initial and follow-up phase for each definable feature of work. The Contractor's three-phase chemical data control process shall assure that minimum data reporting requirements are achieved and shall be implemented according to Section 01440 CONTRACTOR QUALITY CONTROL. When possible, the three-phase chemical data control process shall be combined with that under Section 01440 CONTRACTOR QUALITY CONTROL.

3.9.2 Three-Phase Process

- a. The preparatory phase shall include a review of the specification, SAP, and all relevant SOPs for the chemical parameter measurement and/or chemical sample acquisition and shipment. A physical examination of required forms, materials and equipment shall be included, to ensure conformance with the SAP and to ensure that all materials are onsite. The preparatory plan shall include a demonstration of sampling procedures by the Contractor's field sampling personnel.
- b. The initial phase shall be performed at the initiation of each definable work feature by the CQC Representative to confirm compliance with the SAP, including: instrument calibration; operation and performance checks; sample acquisition, labelling, and shipment in accordance with required SOPs; sampling equipment decontamination; and completion of required documentation.

- c. The follow-up phase shall require daily inspections to ensure compliance with the SAP, and shall include the DCQCR.

3.10 ANALYTICAL TESTING LABORATORIES

~~NOTE: Designate whether an onsite laboratory is a requirement or whether the Contractor is allowed the option of performing chemical analyses either onsite or offsite by the Contractor's or subcontractor's lab in order to comply with analytical requirements of the contract. Specify any special laboratory requirements such as radiation capabilities, special EPA, or state requirements, etc.~~

3.10.1 General

The Contractor shall propose the analytical laboratories to be used for the primary samples analyses. Project laboratories performing QA verification sample analysis and required characterization testing for government- and Contractor-generated solid and liquid wastes, process, non-process, air and offsite sample analysis shall have a USACE validation. The Contractor may utilize its own laboratory or utilize subcontract laboratories to achieve the required sample analyses. The Contractor may utilize its own or a subcontracted field laboratory for the confirmation samples.

3.10.2 Laboratory Analytical Requirements

The Contractor shall provide the specified chemical analyses either by the Contractor's and/or by subcontractor's laboratory. The Contractor shall provide chemical analyses for all parameters by methods specified to achieve the project DQOs.

3.10.3 Laboratory Validation Requirements

The Contractor shall propose the minimum number of laboratories that can attain or have attained USACE validation consistent with contract required chemical data quality. The Contractor may propose laboratories which shall subsequently be validated by the USACE, or select currently validated USACE laboratories. The Contractor shall identify all proposed project laboratories no later than the Coordination Meeting. If a proposed analytical laboratory cannot meet specified analytical requirements or achieve the required validation, the Contractor shall acquire the services of another laboratory that meets the specified analytical requirements and which shall attain the USACE validation. The USACE Laboratory validation process requires a nominal 90 day process. All labs shall be validated in accordance with the following steps:

- a. The nomination by the Contractor of all laboratories to be used for performing source emission sample analysis, ambient air sample analysis and all other solid, liquid and gas phase sample analysis, and the submission by USACE (for each laboratory proposed by the Contractor) of a Laboratory Validation Request Form, as required by USACE, CEMRD/MCX Chemistry Branch, Program Control Coordinator, telephone: 402-221-7494.
- b. The submission by each of the candidate laboratories of their facility specific Laboratory Quality Management Manual (LQMM) which provides key personnel names, education level, experience and responsibility, the laboratory's standard sample receipt form, facility description, equipment list and analytical capabilities in terms of analytical methods offered, method QC, and method detection limits.

- c. Successful analysis, for performance audit samples submitted by USACE, including the analytical results and accompanying minimum data reporting requirements.
- d. Successful laboratory inspection by USACE personency including acceptable deficiency resolution and validation award by USACE, HTRW MCX Laboratory Validation Committee.

3.10.4 Laboratory Performance

The Contractor shall provide and/or require continued acceptable analytical performance and shall establish a procedure to address data deficiencies noted by review and/or quality assurance sample results. The Contractor shall provide and implement a mechanism for providing analytical labs with the SAP or QAPP portion of the SAP, for monitoring the lab's performance and for performing corrective action procedures. The Contractor is responsible for acquiring analytical services with additional USACE validated laboratories in the event a project lab loses its USACE validation status during the project.

3.11 DOCUMENTATION

Documentation records shall be provided as factual evidence that required chemical data has been produced and chemical data quality has been achieved. The documentation shall comply with the requirements specified in paragraphs SAMPLING AND ANALYSIS PLAN, DAILY CHEMICAL QUALITY CONTROL REPORTS, ~~CHEMICAL DATA INTERIM REPORT~~ and CHEMICAL QUALITY CONTROL SUMMARY REPORT.

3.12 NOTIFICATION OF NON-COMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice.

-- End of Section --

Table 01450-1a

Task-Specific Data Quality Objectives - TNT Pipeline

Task	Material/Matrix	Data Quality Objectives	Analytical Level*
1. Field screening of excavation side walls and floor	Soil	1. Using colorimetric TNT Test Kit sampler, or other appropriate field screening method to determine if further excavation is needed to meet clean-up criteria.	Screening
2. Collection and analysis of confirmation, samples and verification.	Soil	2. Determine if the specified clean-up criteria have been met and if further excavation is needed.	Definitive
3. Characterize Government-generated waste for transportation, treatment and/or disposal.	Pipeline materials, soil, Sediment & Liquid	3. Determine the characteristics of the waste for transportation, treatment and/or disposal in accordance with applicable regulations and treatment/disposal facility.	Definitive
4. Characterize Contractor-generated waste for transportation, treatment and/or disposal.	Soil, Sediment & Liquid	4. Determine the characteristics of the waste for transportation, treatment and/or disposal in accordance with applicable regulations and treatment/disposal facility.	Definitive

*As defined in Guidance for the Data Quality Objective Process, EPA/600/R-96/055, September 1994 *Data Quality Objectives for Remedial Activities, Development Process*, EPA/540/G-87/002, March 1987.

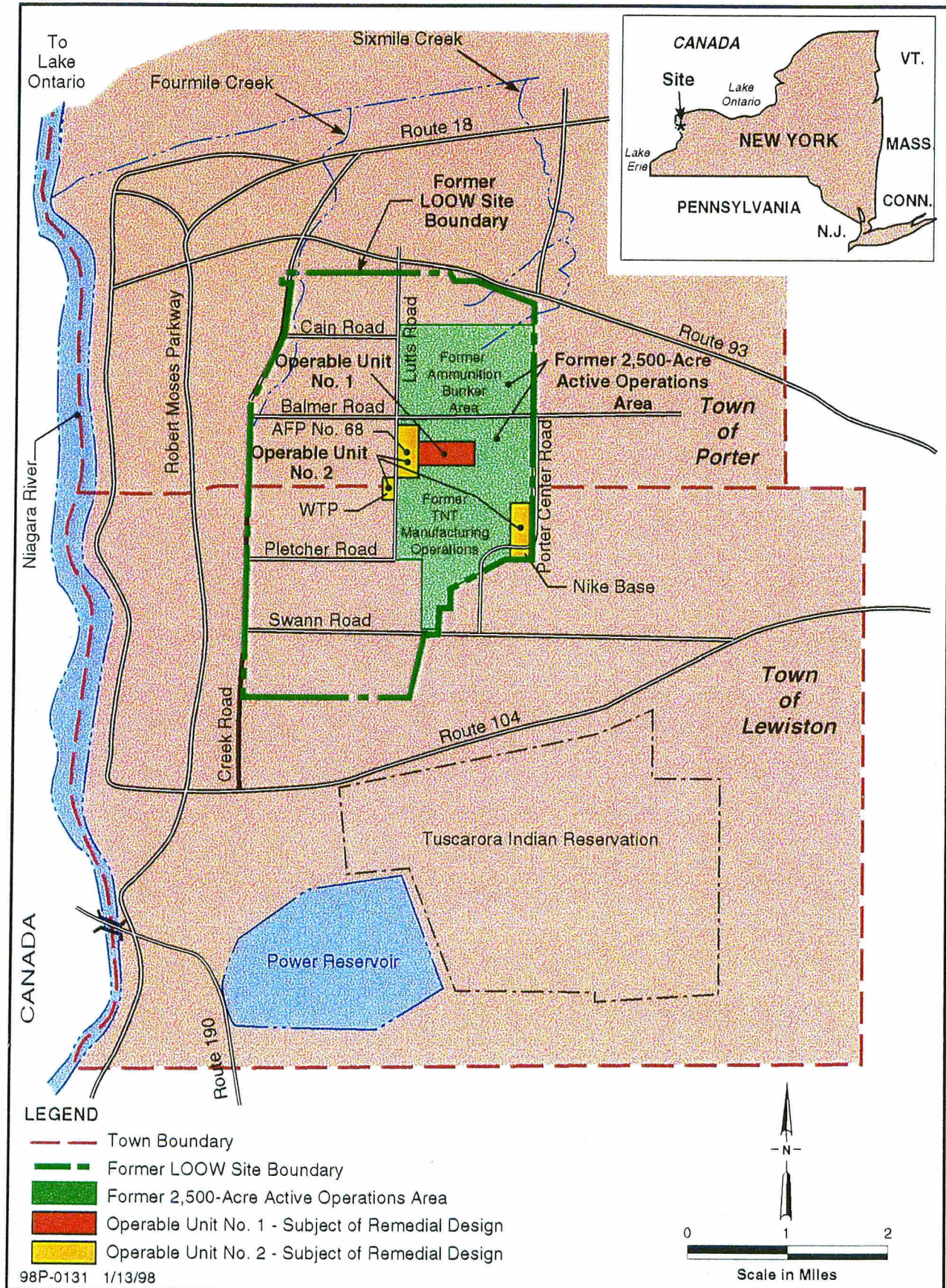
Table 01450-1b

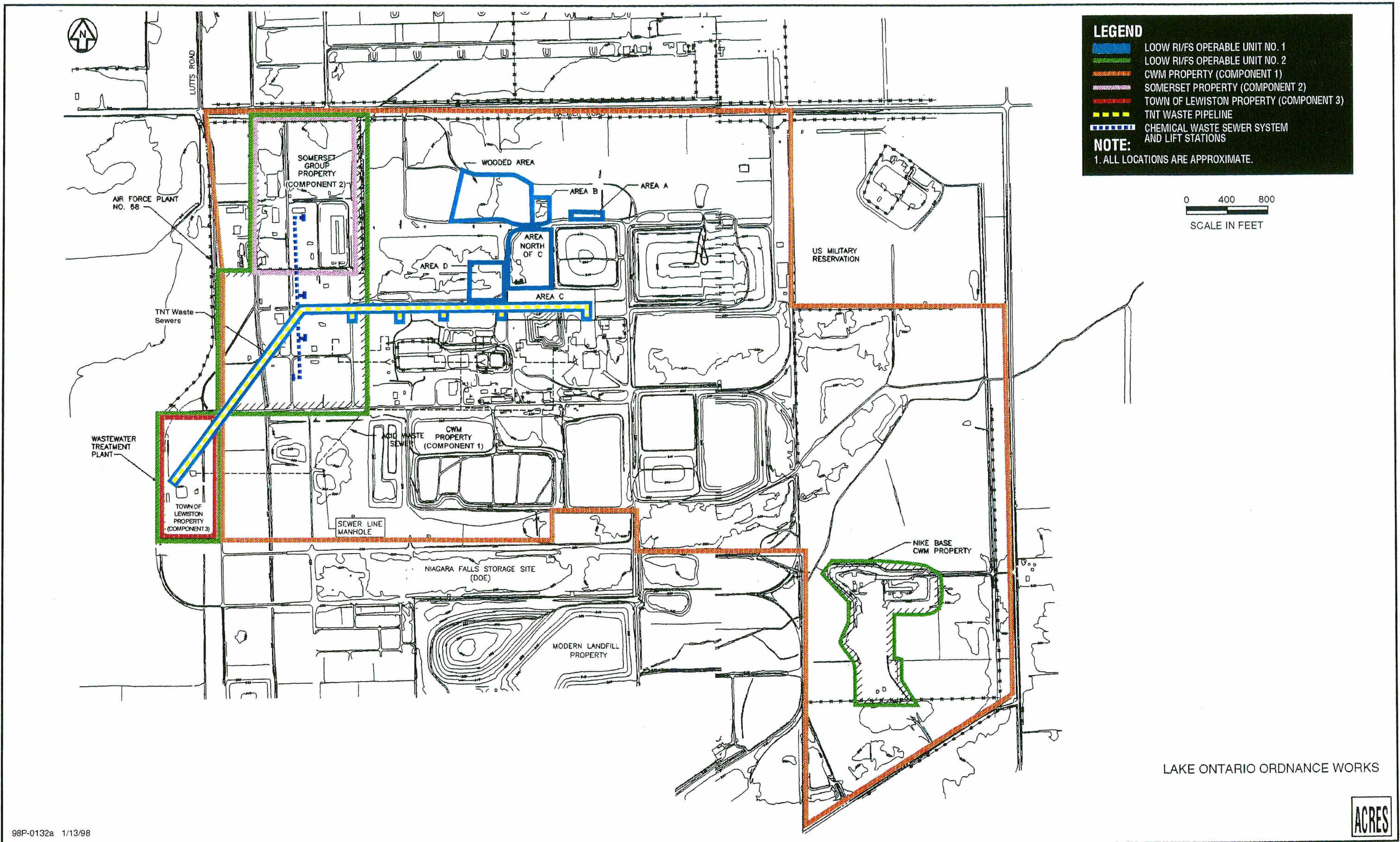
Task-Specific Data Quality Objectives - Chemical Waste Sewer

Task	Material/Matrix	Data Quality Objectives	Analytical Level*
1. Characterize Government-generated waste for transportation, treatment and/or disposal.	Sediment & Liquid	1. Determine the characteristics of the waste for transportation, treatment and/or disposal in accordance with applicable regulations and treatment/disposal facility.	Definitive
2. Characterize Contractor-generated waste for transportation, treatment and/or disposal.	Sediment & Liquid	1. Determine the characteristics of the waste for transportation, treatment and/or disposal in accordance with applicable regulations and treatment/disposal facility.	Definitive

*As defined in Guidance for the Data Quality Objective Process, EPA/600/R-96/055, September, 1994 *Data Quality Objectives for Remedial Activities, Development Process*, EPA/540/G-87/003, March 1987.

01450-28





98P-0132a 1/13/98

LAKE ONTARIO ORDNANCE WORKS

ACRES

FIGURE 01450-2 LOOW STUDY AREA LOCATION MAP

DEPARTMENT OF THE ARMY

CEGS 01500 (September 1993)

U.S. ARMY CORPS OF ENGINEERS

LAKE ONTARIO ORDNANCE WORKS

LEWISTON AND PORTER, NY

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

Includes note relocation Special change (August 1995)

Includes Text Adjustment change 1 (coding) (November 1994)

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES

09/93

NOTE: This guide specification covers the requirements for temporary construction facilities. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

NOTE: This guide specification includes requirements which may be included in projects when applicable. Requirements will be added, deleted, or modified as necessary to meet project requirements.

1.1.1 Site Operations Plan

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas which may have to be graveled to prevent the tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired. Thirty calendar days after Notice to Proceed and following the Preconstruction Conference, the Contractor shall deliver, in person or by independent carrier, 8 copies of the following as directed by the Contracting Officer with at least 1 copy each forwarded to NYSDEC, CWM, and Somerset Properties:

1.1.1.1 Site Operations Plan, including

- a. Dust Control Plan (Section 1561)
- b. Temporary Facilities Plan (paragraph 1.5)
- c. Erosion and Sedimentation Control Plan (Section 1561)
- d. Utility Hookup Plan (paragraph 1.2)
- e. Soil Backfill Staging and Grading Plan (Section 02230 and Section 02227)
- f. Contaminated Soils, Sediments, Liquids and Demolition Waste Staging/Storing/Transporting Plan (Sections 02141, 02142, 02226, and 02228)
- g. Demolition Plan (Section 2050)
- h. Decontamination Plan (Section 02143)
- i. Lift Station and Pipeline Flushing and Sediment/Liquid Handling Plan (Section 02228)
- j. Excavation Staging and Handling Plan-TNT Pipeline (Section 02229)
- k. PCB Remediation Plan (Section 02230)

1.1.1.2 The Contracting Officer will provide comments within 30 calendar days on the above Plans at the Preconstruction Plan Review Conference for incorporation by the Contractor. The Contractor shall submit the final plans with all comments incorporated to the Contracting Officer within 20 calendar days

after the Preconstruction Plan Review Conference. The Contractor shall not begin with any work that is included under a required plan unless approval of the final plan has been given by the Contracting Officer. The Final Plan will become part of the Contract Documents.

1.1.2 Identification of Employees

The Contractor shall be responsible for furnishing to each employee and for requiring each employee engaged on the work to display identification as approved and directed by the Contracting Officer. The Contractor shall follow required security procedures as specified by the property owner. When working on the CWM Property, the Contractor is responsible for coordinating with CWM and obtaining security tags for entry and exit from the site for Contractor personnel, including subcontractors. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works. All Contractor's and their subcontractor's vehicles shall have company identification on both sides of the vehicle in large and clear print that can be read from several hundred feet.

1.1.3 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer and approved by the property owner. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the CWM facility or Somerset Property military installation.

1.2 AVAILABILITY AND USE OF UTILITY SERVICES

1.2.1 Payment for Utility Services

~~The Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies, as specified in the contract.~~ The Contractor shall provide all necessary electrical power of sufficient quantity to meet requirements of this project. The Contractor is responsible for the hook-up, metering, necessary connections, the electrical service itself, and any other costs associated with providing electrical service for the scope of work specified under this Contract. The Contractor shall coordinate all electrical hookups with the local utility company and property owners. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. ~~The Contractor shall carefully conserve any utilities furnished without charge.~~ The Contractor shall specify all utilities that will be required, necessary hookups, method of measurement of use and payment method in his Utility Plan. The Contractor shall also have the option to provide electrical power via a generator.

1.2.2 Meters and Temporary Connections

The Contractor, at its expense and in a manner satisfactory to the Contracting Officer and property owners, shall provide and maintain necessary temporary connections, distribution lines, and meters bases ~~(Government will provide meters)~~ required to measure the amount of each utility used for the purpose of determining charges. The Contractor shall notify the Contracting Officer, in writing, 5 working days before final electrical connection is desired. ~~The Contractor shall so that a utilities contract can be established.~~ The Government will provide a meter and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation by the Contracting Officer and the Property Owners. ~~Under no circumstance shall the Contractor make the final electrical connection.~~

1.2.3 — Advance Deposit

~~An advance deposit for utilities consisting of an estimated month's usage or a minimum of \$50.00 will be required. The last monthly bills for the fiscal year will normally be offset by the deposit and adjustments will be billed or returned as appropriate. Services to be rendered for the next fiscal year, beginning 1 October, will require a new deposit. Notification of the due date for this deposit will be mailed to the Contractor prior to the end of the current fiscal year.~~

1.2.4 — Final Meter Reading

~~Before completion of the work and final acceptance of the work by the Government, the Contractor shall notify the Contracting Officer, in writing, 5 working days before termination is desired. The Government will take a final meter reading, disconnect service, and remove the meter(s). The Contractor shall then remove all the temporary distribution lines, meter base(s), and associated paraphernalia. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.~~

1.2.53 Sanitation

The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Contracting Officer. All sanitary facilities shall be of the chemical toilet type, unless otherwise approved by the Contracting Officer. All sanitary wastes will be collected and removed from the site in an appropriate manner and in accordance with USACE Regulation EM 385-1-1 and OSHA Standard 29 CFR 1910.120. ~~Government~~ Property owner toilet facilities will not be available to Contractor's personnel.

1.2.64 Telephone

~~The Contractor shall make arrangements and pay all costs for telephone facilities desired.~~

The Contractor shall make the necessary arrangements with the local telephone company to install equipment and service to meet project requirements. The Contractor shall be responsible for all installation, service, and shutoff costs. At a minimum, three direct lines shall be made available at the Contracting Officer's field office. The Contractor shall also have the option to provide cellular service.

1.2.5 Water Supply

The Contractor shall provide the necessary water supply of sufficient volume and pressure to satisfy the project requirements. The Contractor may coordinate the connection to the location water supply. The Contractor shall provide the necessary tapping equipment, fittings, and valves for connection to the local water supply. The Contractor shall be responsible for any cost associated with this activity. The Contractor shall properly abandon the system at the termination of the Contract as directed by the Contracting Officer.

1.3 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.3.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 915 by 1220 mm (36 by 48 inches) in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is

completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.3.2 Project and Safety Signs

The requirements for the signs and their content, and location shall conform to the requirements be as shown on Attachments 1 and 2 the drawings. The signs shall be erected at a location designated by the Contracting Officer within 15 days after receipt of the notice to proceed. The data required by the safety sign shall be corrected daily, with light colored metallic or non-metallic numerals. Upon completion of the project, the signs shall be removed from the site.

1.4 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall coordinate traffic of personnel vehicles, company vehicles, subcontractor's vehicles, waste haulers, and deliveries with the property owner. All vehicles must be cleared through CWM's security prior to entering or exiting the site. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the property owner State and local authorities having jurisdiction. The Contractor shall provide snow removal from all work areas as necessary. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with the property owner's operations and off-site public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.4.1 Haul Roads

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. Haul roads shall be constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust control, although optional, shall be adequate to ensure safe operation at all times. Location, grade, width, and alignment of construction and hauling roads shall be subject to approval by the Contracting Officer and property owner. Lighting shall be adequate to assure full and clear visibility for full width of haul road and work areas during any night work operations. Upon completion of the work, haul roads designated by the Contracting Officer shall be removed. The Contractor shall maintain all access and temporary access roads to provide positive drainage, dust control, mud control, and vehicle access. Any damage (e.g., washouts, excessive rutting) shall be promptly repaired by the Contractor. The use of existing paved and unpaved roads for transport of tracked vehicles, waste hauling, soil borrow hauling, and other heavy load traffic shall be coordinated and approved by the property owner.

1.4.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.4.3 Replacement of Roadways

The Contractor shall replace as specified all roadways that are damaged or removed as part of the remediation. The cost of roadway replacement shall be part of the bid item for the remediation of each area specified.

1.5 CONTRACTOR'S TEMPORARY FACILITIES

1.5.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel. Temporary buildings, storage sheds, shops, offices, etc., shall be erected by the Contractor only with the approval of the Contracting Officer, and shall be built with labor and materials furnished by the Contractor without expense to the Government. The Contractor shall provide a plan as part of his Temporary Facilities Plan, the location of proposed field offices, waste staging and soil stock pile areas, and other temporary support structures. The potential locations of the field offices and support structures are shown in the Drawings.

1.5.2 Storage Area

~~The Contractor shall construct a temporary 1.8 meter (6 foot) high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored [green] [brown], so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. At the end of each work day mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area.~~

The Contractor shall provide as part of the Temporary Facilities Plan the location of proposed storage areas for equipment and materials.

1.5.3 Supplemental Storage Area

~~Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.~~

1.5.3.4 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the ~~site~~ military property.

1.5.5 Maintenance of Storage Area

~~Fencing shall be kept in a state of good repair and proper alignment.~~ Should the Contractor elect to traverse with construction equipment or other vehicles grassed or unpaved areas between designated work areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the ~~office trailer and equipment/material storage areas~~ construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.5.6 New Building

In the event a new building is constructed for the temporary project field office, it shall be a minimum 3.6 meters (12 feet) in width, 4.9 meters (16 feet) in length and have a minimum of 2.1 meters (7 feet) headroom. It shall be equipped with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. It shall be provided with a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building shall be waterproof, shall be supplied with heater, shall have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities shall be furnished. The windows and doors shall be screened and the doors provided with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 11 degrees C (20 degrees F) below the outside temperature when the outside temperature is 35 degrees C, (95 degrees F,) shall be furnished. Any new building erected for a temporary field office shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall become the property of the Contractor and shall be removed from the site. All charges for telephone service for the temporary field office shall be borne by the Contractor, including long distance charges up to a maximum of \$75.00 per month.

1.5.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. ~~The Contractor shall be responsible for the security of its own equipment. The Contractor shall provide the necessary site security measures at the site to protect his equipment, materials, and supplies. The Government or property owners are not responsible for any damage to the Contractor's equipment, vehicles, supplies, etc., due to unauthorized entry; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.~~

1.6 GOVERNMENT FIELD OFFICE

1.6.1 Resident Engineer's Office

The Contractor shall provide the Government Resident Engineer with an office, approximately 19 square meters (200 square feet) in floor area, located where directed and providing space heat, electric light and power, and toilet facilities consisting of one ~~chemical toilet lavatory and one water closet complete with connections to water and sewer mains.~~ A mail slot in the door or a lockable mail box mounted on the surface of the door shall be provided. At completion of the project, the office shall remain the property of the Contractor and shall be removed from the site. ~~Utilities shall be connected and disconnected in accordance with local codes and to the satisfaction of the Contracting Officer.~~ The

Contractor shall also maintain the office facility providing janitorial services, including but not limited to, emptying trash, sweeping floors and periodical washing floors and windows.

1.6.2 Trailer-Type Mobile Office

The Contractor may, at its option, furnish and maintain a trailer-type mobile office acceptable to the Contracting Officer and providing as a minimum the facilities specified above. The trailer shall be securely anchored to the ground at all four corners to guard against movement during high winds. The Contractor may rent, if offered by the property owner, available/existing trailer and/or storage sheds/buildings for his use for the project. This option shall be discussed at the Preconstruction Conference.

1.7 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.8 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 1.07 meters (42 inches) high, supported and tightly secured to steel posts located on maximum 3 meters (10 foot) centers, constructed at the approved location. The safety fencing shall be maintained by the Contractor during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.9 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.10 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, these areas shall be restored to the original or better condition. The Contractor shall remove all sediments, liquids, and absorbents from staging and loading areas for subsequent disposal prior to site closeout. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

1.11 PROTECTION OF MONITORING WELLS

The Contractor shall locate and protect all monitoring wells in his area from damage and abuse. The Contractor is not allowed to remove/abandon any monitoring well unless said Contractor has permission from the Contracting Officer. Any damage to a monitoring well will immediately be reported to the Contracting Officer. The Contracting Officer will notify the property owner (if the well is not government property) of any requests for removal/abandonment of monitoring wells or any damage to the wells caused by the Contractor. If a monitoring well is damaged, the monitoring well shall be

restored by the Contractor at no additional expense to the government following guidelines contained in (need USACE reference). If, in the opinion of the Contracting Officer or property owner, the well cannot be repaired, the Contracting Officer shall direct the Contractor (at his own expense) to pull the well casing and properly abandon the well following the above-mentioned requirements. The Contracting Officer shall then direct the Contractor (at his own expense) to install a replacement monitoring well at a similar location as located by the Contracting Officer or property owner. The Contractor shall number said replacement well as directed by the Contracting Officer or property owner. The Contractor shall supply well specifications for approval prior for replacement.

(Attachments Follow)
-- End of Section --

ATTACHMENTS

Attachment 1 - Project Identification Sign

Attachment 2 - Safety Performance Sign

PROJECT IDENTIFICATION SIGN

MILITARY PROJECT

The graphic format for this 4' x 6' sign panel follows the legend guidelines and layout as specified below. The large 4' x 4' section of the panel on the right is to be white with black legend. The 2' x 4' section of the sign on the left with the full Corps signature (reverse version) is to be screen printed Communications Red on the white background. The castle insignia will be furnished by the Government in pressure sensitive vinyl for affixing by the Contractor. See attached sheet for fabrication and mounting guidelines.

SAMPLE:

Legend Group 1: One- to two-line description of Corps relationship to project.

Color: White
Typeface: 1.25" Helvetica Regular
Maximum line length: 19"

Legend Group 2: Division or District Name (optional). Placed below 10.5" Reverse Signature (6" Castle).

Color: White
Typeface: 1.25" Helvetica Regular

Legend Group 3: One- to three-line project title legend describes the work being done under this contract.

Color: Black
Typeface: 3" Helvetica Bold
Maximum line length: 42"

Legend Group 4: One- to two-line identification of project or facility (civil works) or name of sponsoring department (military).

Color: Black
Typeface: 1.5" Helvetica Regular
Maximum line length: 42"

Cross-align the first line of Legend Group 4 with the first line of the Corps Signature (US Army Corps) as shown.

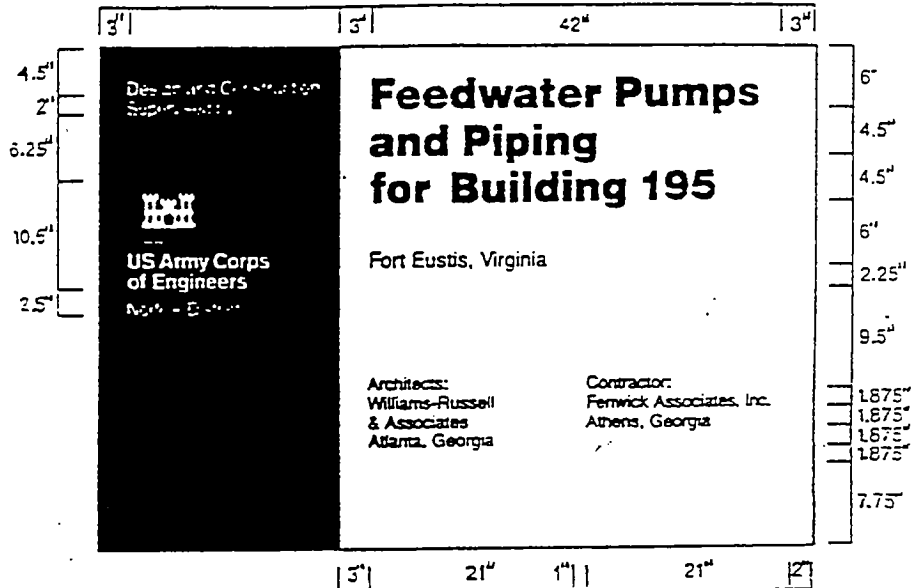
Legend Groups 5a-b: One- to five-line identification of prime contractors including: type (architect, general contractor, etc.), corporate or firm name, city, state. Use of Legend Group 5 is optional.

Color: Black
Typeface: 1.25" Helvetica Regular
Maximum line length: 21"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown.

Letter- and word-spacing to follow Corps standards as specified in

* Appendix D.



(Dimensions are in inches)

Sign Type	Legend Size	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-01	various	4' x 6'	4" x 4"	HDO-3	48"	WH-RD/BK

* Refers to the U.S. Army Corps of Engineers "Sign Standards Manual", EP-310-1-6.

SAFETY PERFORMANCE SIGN

The graphic format, color, size and type-faces used on the sign are to be reproduced exactly as specified below. The title with First Aid logo in the top section of the sign, and the performance record captions are standard for all signs of this type. Legend Groups 2 and 3 below identify the project and the contractor and are to be placed on the sign as shown. Safety record numbers are mounted on individual metal plates and are screw-mounted to the background to allow for daily revisions to posted safety performance record.

Legend Group 1: Standard two-line title "Safety is a Job Requirement", with (8" od.) Safety Green First Aid logo. Color: To match PMS 347 Typeface: 3" Helvetica Bold Color: Black

Legend Group 2: One- to two-line project title legend describes the work being done under this contract and name of host project. Color: Black Typeface: 1.5" Helvetica Regular Maximum line length: 42"

Legend Group 3: One- to two-line identification: name of prime contractor and city, state address. Color: Black Typeface: 1.5" Helvetica Regular Maximum line length: 42"

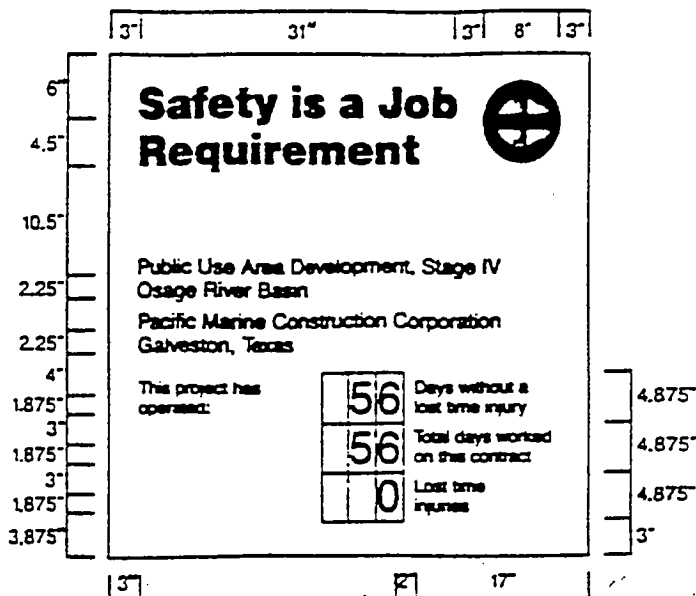
Legend Group 4: Standard safety record captions as shown. Color: Black Typeface: 1.25" Helvetica Regular

Replaceable numbers are to be mounted on white .060 aluminum plates and screw-mounted to background. Color: Black Typeface: 3" Helvetica Regular Plate size: 2.5" x .5"

All typography is flush left and rag right, upper and lower case with initial capitals only as shown. Letter- and word-spacing to follow Corps standards as specified in Appendix D.

* Appendix D.

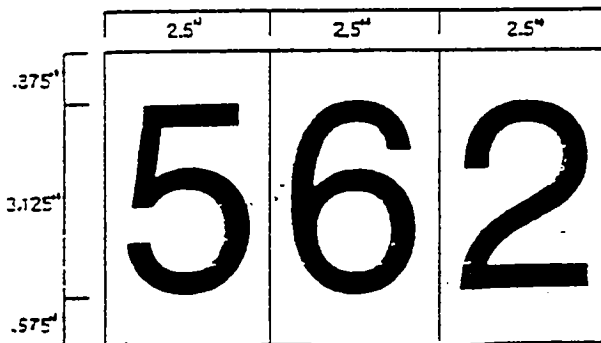
* Refers to the U.S. Army Corps of Engineers, "Sign Standards Manual", EPS-310-1-6.



Dimensions in inches.

See attached sheet for fabrication and mounting guidelines.

Sign Type	Legend Size	Panel Size	Post Size	Specification Code	Mounting Height	Color Bkg/Lgd
CID-02	various	4' x 4'	4" x 4"	HDO-3	48"	WH/BK-GR



Fabrication and Mounting Guidelines

All Construction Project Identification signs and Safety Performance signs are to be fabricated and installed as described below. The signs are to be erected at a location designated by the contracting officer and shall conform to the size, format, and typographic standards shown on the attached sheets.

Detailed specifications for HDO plywood panel preparation are provided in Appendix B. **

Shown below the mounting diagram is a panel layout grid with spaces provided for project information. Photocopy this page and use as a worksheet when preparing sign legend orders.

The sign panels are to be fabricated from .75" High Density Overlay Plywood. Panel preparation to follow HDO specifications provided in Appendix B. **

Sign graphics to be prepared on a white non-reflective vinyl film with positionable adhesive backing.

All graphics except for the Communications Red background with Corps signature on the project sign are to be die-cut or computer-cut non-reflective vinyl, pre-spaced legends prepared in the sizes and typefaces specified and applied to the background panel following the graphic formats shown on the attached sheets.

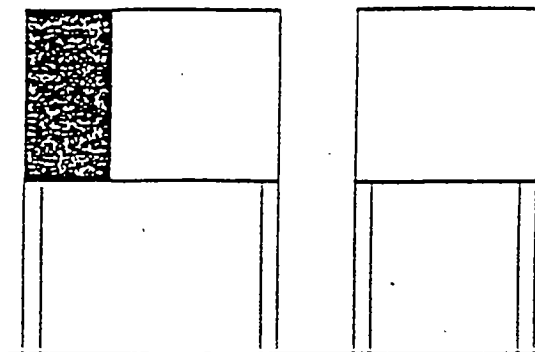
The 2' x 4' Communications Red panel (to match PMS-032) with full Corps signature (reverse version) is to be screen printed on the white background. Identification of the District or Division may be applied under the signature with white cut vinyl letters prepared to Corps standards. Large scale reproduction artwork for the signature is provided on page 4.8 (photographically enlarge from 6.875" to 10.5"). **

Drill and insert six (6) .375" T-nuts from the front face of the HDO sign panel. Position holes as shown. Flange of T-nut to be flush with sign face.

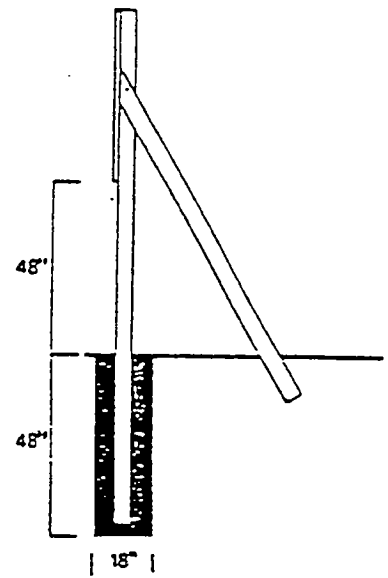
Apply graphic panel to prepared HDO plywood panel following manufacturers' instructions.

Sign upnghts to be structural grade 4" x 4" treated Douglas Fir or Southern Yellow Pine, No.1 or better. Post to be 12' long. Drill six (6) .375" mounting holes in upnghts to align with T-nuts in sign panel. Countersink (.5") back of hole to accept socket head cap screw (4" x .375").

Assemble sign panel and upnghts. Imbed assembled sign panel and upnghts in 4' hole. Local soil conditions and/or wind loading may require bolting additional 2" x 4" struts on inside face of upnghts to reinforce installation as shown.



(Dimensions in inches)



** Refers to the U.S. Army Corps of Engineers, "Sign Standards Manual", EP-310-1-6.

Construction Project Sign Legend Group 1: Corps Relationship

1. _____
2. _____

Legend Group 2: Division/District Name

1. _____
2. _____

Legend Group 3: Project Title

1. _____
2. _____
3. _____

Legend Group 4: Facility Name

1. _____
2. _____

Legend Group 5a: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Legend Group 5b: Contractor/A&E

1. _____
2. _____
3. _____
4. _____
5. _____

Safety Performance Sign Legend Group 1: Project Title

1. _____
2. _____

Legend Group 2: Contractor/A&E

1. _____
2. _____

**LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY**

SECTION 01561

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

The work covered by this section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution during, and as the result of, construction operations under this contract except for those measures set forth in the Technical Provisions of these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life or affect other species of importance to man. The control of environmental pollution requires consideration of air, water, and land.

PART 2 APPLICABLE REGULATIONS

The Contractor and his subcontractors in the performance of this contract, shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement in effect on the date of this solicitation, as well as the specific requirements stated elsewhere in the contract specifications.

PART 3 NOTIFICATION

The Contracting Officer will notify the Contractor of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately take corrective action. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of time lost due to any such stop order shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

PART 4 SUBCONTRACTORS

Compliance with the provisions of this section by subcontractors will be the responsibility of the Contractor.

PART 5 PROTECTION OF WATER RESOURCES

The Contractor shall not pollute streams, lakes, ~~or~~ reservoirs, or wetlands with fuels, oils, bitumens, calcium chloride, acid construction wastes or other harmful materials. All work under this contract shall be performed in such a manner that objectionable conditions will not be created in streams through or adjacent to the project areas.

PART 6 EROSION AND SEDIMENTATION CONTROL

~~The Contractor shall accomplish the erosion and sedimentation control in accordance with the Contract Drawings. The Contractor shall submit for approval by the Contracting Officer and applicable state and local agencies an Erosion and Sediment Control Plan that uses the contract Drawings as guidance. The~~

Contractor's Erosion and Sedimentation Control Plan shall be submitted as part of the Site Operations Plan (Section 01500, TEMPORARY CONSTRUCTION FACILITIES). The Contractor is responsible for obtaining any necessary approvals and permits to perform the work, including earth disturbance. The Contractor shall use the contract Drawings as a guidance for preparation of his Erosion and Sedimentation Control Plan, but shall provide his specific details to reflect his approach to the work. Silt fences and/or straw bale barriers may be used as temporary measures to minimize the movement of soil on-site. Silt fences shall be installed as directed by the manufacturer. Straw bales shall be staked as needed to provide adequate stability.

PART 7 BURNING

No burning will be allowed. ~~without prior approval from the Property Owners and the NYSDEC Fire Rangers. The specific time, location and manner of burning shall be subject to the approval of NYSDEC Fire Ranger and the Contracting Officer. Fires shall be confined to a closed vessel, guarded at all times and shall be under constant surveillance until they have burned out or have been extinguished unless otherwise permitted by NYSDEC. All burning shall be so thorough that the materials will be reduced to ashes.~~

PART 8 DUST CONTROL

The Contractor shall maintain all work area free from dust which would contribute to air pollution. Approved temporary methods of stabilization consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods will be permitted to control dust. Sprinkling, where used, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

PART 9 PROTECTION OF LAND RESOURCES:

9.1 GENERAL

It is intended that the land resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. Insofar as possible, the Contractor shall confine his construction activities to areas defined by the Drawings and Specifications or to be cleared for other operations. The following additional requirements are intended to supplement and clarify the requirements of the CONTRACT CLAUSES.

9.2 PROTECTION OF ~~TREES~~-RETAINED TREES:

9.2.1 Protection

The Contractor shall be responsible for the protection of the tops, trunks and roots of all existing trees that are to be retained on the site. Protection shall be maintained until all work in the vicinity has been completed and shall not be removed without the consent of the Contracting Officer. If the Contracting Officer finds that the protective devices are insufficient, additional protection devices shall be installed.

9.2.2 General Storage

Heavy equipment, vehicular traffic, or stockpiling of any materials shall not be permitted within the drip line of trees to be retained.

9.2.3 Toxic Materials Storage

No toxic materials shall be stored within 100 feet from the drip line of trees to be retained.

9.2.4 Trees and Shrubs

Except for areas shown on the plans to be cleared, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without special authority. Existing near by trees shall not be used for anchorage unless specifically authorized by the Contracting Officer. Where such special emergency use is permitted, the Contractor shall first adequately protect the trunk with a sufficient thickness of burlap over which softwood cleats shall be tied.

9.2.5 Tree Protection

No protective devices, signs, utility boxes or other objects shall be nailed to trees to be retained on the site.

9.3 RESTORATION OF LANDSCAPE DAMAGE

Any trees or other landscape feature scarred or damaged by the Contractor's operations shall be restored as nearly as possible to its original condition at the Contractor's expense. The Contracting Officer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of. All scars made on trees, designated on the plans to remain, and all cuts for the removal of limbs larger than 1-inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted. Where tree climbing is necessary, the use of climbing spurs will not be permitted. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Contracting Officer, shall be immediately removed and replaced with a nursery-grown tree of the same species. Replacement trees shall measure no less than 2" in diameter at 6 inches above the ground level.

9.4 LOCATION OF STORAGE AND SERVICE FACILITIES

The location on Government property of the Contractor's storage and service facilities, required temporarily in the performance of the work, shall be upon cleared portions of the job site or areas to be cleared. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Plans showing storage and service facilities shall be submitted for approval to the Contracting Officer. Where buildings or platforms are constructed on slopes, the Contracting Officer may require cribbing to be used to obtain level foundations. Benching or leveling of earth may not be allowed, depending on the location of the proposed facility.

9.5 TEMPORARY EXCAVATION AND EMBANKMENTS

If the Contractor proposes to construct temporary roads, embankments or excavations for ~~plant and/or~~ work areas, he shall submit a plan for approval prior to scheduled start of such temporary work.

--End of Section--

**LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY**

INSTRUCTION: ~~FOR ALL CONSTRUCTION CONTRACTS~~

SECTION 01720

AS-BUILT DRAWINGS

INDEX

1. ~~General~~
2. ~~Progress Marked Up As-Built Prints~~
3. ~~Preliminary Submittals~~
4. ~~Drawing Preparation~~
5. ~~Final Requirements~~
6. ~~Payment~~

PART 1 GENERAL

This section covers the preparation of as-built marked drawings complete, as a requirement of this contract.

PART 2 PROGRESS MARKED UP AS-BUILT PRINTS

The Contractor shall mark up one set of paper prints to show the as-built conditions. These as-built marked prints shall be kept current and available on the job site at all times. All changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The as-built marked prints will be jointly inspected for accuracy and completeness by the Contracting Officer's representative and a responsible representative of the Construction Contractor prior to submission of each monthly pay estimate. The drawings shall show the following information, but not be limited thereto:

2.1 UTILITIES

The location and description of any utility lines or other installations of any kind or description known to exist within the construction area. The location includes dimensions to permanent features.

~~The location and dimensions of any changes within the building or structure.~~

2.32 GRADE OR ALINEMENT

Correct grade or alinement of roads, structures or utilities if any changes were made from contract plans.

2.43 ELEVATIONS

Correct elevations if changes were made in site grading.

2.54 CHANGES IN DETAIL DESIGN

Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

2.65 DRAINAGE

The topography and grades of all drainage installed or affected as a part of the project construction.

2.76 FINAL INSPECTION

All changes or modifications which result from the final inspection.

2.87 OPTIONS

Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the as-built prints.

PART 3 PRELIMINARY SUBMITTAL

The Contractor shall prepare two copies of the progress as-built prints and these shall be delivered to the Contracting Officer at the time of final inspection for his review and approval. These as-built marked prints shall be neat, legible and accurate. The review by Government personnel will be expedited to the maximum extent possible. Upon approval, one copy of the as-built marked prints will be returned to the Contractor for use in preparation of final as-built drawings. If upon review, the drawings are found to contain errors and/or omissions, they shall be returned to the Contractor for corrections. The Contractor shall complete the corrections and return the as-built marked prints to the Contracting Officer within ten (10) calendar days.

PART 4 DRAWING PREPARATION

4.1 GENERAL

Upon approval of the as-built prints submitted, the Contractor will be furnished the original set of contract drawings with all amendments incorporated. These drawings shall be modified as may be necessary to correctly show all the features of the project as it has been constructed by bringing the contract set into agreement with the approved as-built prints, adding such additional drawings as may be necessary. These drawings are part of the permanent records of this project and the Contractor shall be responsible for the protection and safety thereof until returned to the Contracting Officer. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at his expense.

4.2 PERSONNEL QUALIFICATIONS FOR DRAWINGS

Only personnel proficient in the preparation of engineering drawings to standards satisfactory and acceptable to the Government shall be employed to modify the original contract drawing or prepare

additional new drawings. All additions and corrections to the contract drawings shall be neat, clean and legible, and shall match the adjacent existing linework and/or lettering being annotated in type, density, size and style. All drafting work shall be done using the same medium (pencil, plastic lead or ink) that was employed on the original contract drawings and with graphite lead on paper base material. The Contracting Officer will review all as-built drawings for accuracy and conformance to the above specified drafting standards. The Contractor shall make all corrections, changes, additions, and deletions required to meet these standards. The title block to be used for any new as-built drawings shall be similar to that used on the original drawings.

4.3 FINAL REVISIONS

When final revisions have been completed, each drawing shall be lettered or stamped with the words "RECORD DRAWING AS-BUILT" followed by the name of the General Contractor in letters at least 3/16" high.

All original contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. All original contract drawings shall be dated in the revision block (SEE ATTACHMENT 1).

PART 5 FINAL REQUIREMENTS

After receipt by the Contractor of the approved marked as-built prints and the original contract drawings the Contractor will within 30 days for contracts less than \$5 million or 60 days for contracts \$5 million and above, make the final as-built submittal. This submittal shall consist of the completed as-built drawings, two blue line prints of these drawings and the return of the approved marked as-built prints. They shall be complete in all details. All paper prints and reproducible drawings will become the property of the Government upon final approval. Failure to submit as-built drawings and marked prints as required herein shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

PART 6 PAYMENT

No separate payment will be made for the as-built drawings required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor.

ATTACHMENTS FOLLOW

--End of Section--

ATTACHMENT 1

**USACE BUFFALO, NY DISTRICT TITLE BLOCK
(To be provided by USACE New York District)**

DIVISION 2

SITE WORK

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

SECTION 02010

CONFIRMATION, VERIFICATION, AND POST-INTERIM REMOVAL ACTION SAMPLING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA)

EPA/540/P-91/008	Compendium of ERT Waste Sampling Procedures, 1991
EPA SW-846	Test Methods for Evaluating Solid Wastes (Nov. 1986 or most current version)

1.2 SUBMITTALS

1.2.1 Sampling and Analysis Plan (SAP)

The Contractor shall prepare a SAP for the confirmation and verification sampling in accordance with Section 01450: CHEMICAL DATA QUALITY CONTROL.

1.2.2 Statements

- a. Sample Log

1.2.3 Closeout Report

- a. Confirmation and Verification Sampling Analysis Results

1.3 DEFINITIONS

1.3.1 Contractor Generated Wastes

Contractor generated wastes shall include all materials which become contaminated as a result of Contractor activity at the site after the commencement of contract work.

1.3.2 Government Generated Wastes

Government generated wastes shall include all contaminated materials existing at the site prior to the commencement of contract work.

1.3.3 Confirmation Sampling

Confirmation sampling shall include all sampling conducted in the open excavations during the post-removal stage to confirm the removal of all contaminated soil to the specific cleanup level.

1.3.4 Verification Sampling

Quality Assurance (QA) verification sampling shall be performed at a minimum of 20 percent of the total explosive and 10 percent of all other analytes of the confirmation samples and shall consist of split samples analyzed for the complete compound list as specified. Verification samples shall be performed at a USACE-approved independent analytical laboratory.

1.3.5 Post-Interim Removal Action Sampling

Post-Interim Removal Action (IRA) Sampling shall be performed in sections of the TNT pipeline and in the Chemical Waste Sewer at each accessed location. Post-IRA samples shall be collected following the video survey of the flushed line and prior to installing the grout plug. Post-IRA samples will be taken for the purpose of documenting the Post-IRA condition, but will not be used to determine the need for additional remediation under this Phase 1, Component 1 of the IRA.

1.4 DESCRIPTION OF WORK

1.4.1 Contractor Generated Wastes

Collect and analyze environmental samples from each Contractor generated waste stream to determine applicable transportation and disposal requirements.

1.4.2 Government Generated Waste

Collect and analyze confirmation and verification samples from the excavated areas after Government generated waste has been removed to confirm the removal of all contaminated soil to the specific clean-up criteria.

1.5 QUALITY ASSURANCE

1.5.1 Waste Sampling

The Contractor shall adhere to all sample acquisition, handling, custody documentation, decontamination, and quality assurance/quality control (QA/QC) requirements and procedures as specified in the Contractor's approved SAP as outlined in Section 01450: CHEMICAL DATA QUALITY CONTROL.

1.5.2 Analytical Laboratory

The Contractor shall be solely responsible for the execution and accuracy of the confirmation and QA verification sample analyses. The Contractor shall use an USACE-certified laboratory for all QA verification sample analyses. Confirmation sampling may be performed in an on-site laboratory or an off-site independent laboratory. If the Contractor uses a field laboratory, then the field laboratory shall meet all USACE requirements for field laboratories. All analytical standard methods shall be in accordance, at a minimum, with federal, state, and local requirements and meet the Data Quality Objectives of the Contractor's approved SAP for confirmation and verification sampling.

1.5.3 Data Validation

An independent firm shall be subcontracted to conduct data validation of the QA verification sample analysis according to the EPA National Functional Guidelines, using any existing EPA Region II modifications to the National Functional Guidelines. Data validation results shall be provided in the Contractor's Closeout Report.

PART 2 PRODUCTS

2.1 MATERIALS

The Contractor shall provide all of the materials required for confirmation, verification, and post-IRA sample collection for both remote and non-remote sample collection. The Contractor shall provide all of the materials required to sample and analyze stockpiled, containerized, stored solid and liquid wastes; backfill materials; and stockpile areas as required in these specifications. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall supply all personnel, equipment, and facilities necessary to collect and analyze the confirmation, verification, and post-IRA samples required for each area to be remediated.

3.1.1 Sample Acquisition

Following the excavation of the material to the initial limits, the Contractor shall:

- a. Visually inspect the area for stained or discolored soil and monitor excavation with field instruments.
- b. If no staining or discoloration is visible or field instruments/field screening methods do not indicate the presence of contaminants, then confirmation samples shall be collected according to 3.1.1.1.
- c. If staining or discoloration is visible or field instruments indicate the presence of contaminants, or additional contamination is suspected, the Contractor shall notify the Contracting Officer (CO). Initial field screening methods may consist of Photo Ionization Detector (PID), Flame Ionization Detector (FID), or equivalent field instruments, available field test kits or other acceptable methods. If sustained field screening readings greater than 5 units above background are observed on soil samples removed from the excavation or field test kits indicate contamination, then the CO will direct the Contractor to either continue excavation or perform confirmation sampling.
- d. Confirmation sampling shall be conducted as presented in Part 3.1.1.1. If confirmation results exceed the site-specific, contaminant-specific cleanup criteria presented in Table 02010-1, then excavation shall continue horizontally and vertically, at the direction of the CO, until the confirmation results are below the site-specific, contaminant-specific cleanup criteria.

3.1.1.1 Confirmation, Verification, and Post-Interim Removal Action (IRA) Samples

For excavations below 4 ft., remote sampling is preferred to minimize the amount of extraneous material excavated outside the initial limits. The Contractor must obtain approval of the CO to use other

methods under these conditions. The number and frequency of confirmation samples to be collected by the Contractor will be dependent on the area. The estimated initial confirmation sampling grids for the specific remediation area are presented in Figure 02010-1. Table 02010-2 provides the estimated initial number of confirmation and QA split verification samples. Requirements for turnaround time, test method and lab requirements are also provided in Table 02010-2. The Contractor shall collect Quality Control samples for the confirmation samples consisting of field duplicate, equipment rinsate blanks, and matrix spike/matrix spike duplicates (MS/MSDs) and MS/MSDs for the verification samples as specified in the QAPP in Section 01450: CHEMICAL DATA QUALITY CONTROL. Duplicates and MS/MSDs shall be collected at a minimum rate of 10% of total confirmation or verification samples, as appropriate.

The Contractor shall provide the results of the confirmation analysis for the TNT pipeline within a 24-hr period from the time the samples were collected. The CO may direct the Contractor to excavate additional materials within grids that exceed the clean-up criteria, or await results of the QA verification sample results prior to directing the Contractor to backfill the area.

QA split verification samples shall be collected and analyzed for the compounds listed in Table 02010-2 for at least 20 percent of the confirmation samples for explosive compounds and 10 percent for all other analytes. A minimum number of QA verification samples for the initial and confirmation samples is specified in Table 02010-2. Verification samples are to be analyzed at an independent approved laboratory. The results of the verification sample analysis shall be provided to the CO within 48 hours of the time of sampling. The results presented at that time may be a laboratory-prepared summary of the results. A complete laboratory package for data validation shall be provided at the completion of the laboratory program.

3.1.1.1.1 Chemical Waste Sewer and Lift Stations

Confirmation samples are not required for the Chemical Waste Sewer and Lift Stations. The Contractor shall complete a video inspection of the pipeline after removal activities have been completed. In addition, the Contractor shall collect post-interim removal action samples to document the post-remediation conditions. Wipe samples will be collected from the inside wall using a remote collection method. Samples will be collected at a rate of one sample per accessible location, which will be each end to be plugged. At a minimum, one wipe sample shall be taken in each of the lines leading into a lift station (12 minimum samples). The samples will be analyzed at an off-site/fixed based laboratory for TCL semivolatiles and PCBs using EPA Methods 8250 (GC/MS) and 8082 (GC), respectively. The samples will be collected by wiping a 10 cm x 10 cm area of the inside of the sewer/lift station using a remote sampler. The wipe sample will be collected using a dedicated clean gauze pad that has been premoistened with methanol and a clean stainless-steel or aluminum template. A clean pair of phthalate-free gloves will be used to collect each sample.

3.1.1.1.2 TNT Pipeline

Soil confirmation samples shall be taken along sections of the TNT pipeline that have been removed or power washed based on visual evidence of staining spills and/or evidence of past leakage into the surrounding soils as stated in this paragraph. Soil field screening confirmation samples shall be analyzed using colorimetric field test kits for TNT that can determine concentrations within a range of 10 to 50 ppm and greater using a spectrophotometer. At a minimum, confirmation samples shall be taken at each end of each removed/or flushed section from both the north line and south line (two samples from each end of each pipeline segment). In addition, confirmation samples shall be collected at 250 ft intervals for sections less than 500 ft and at 500 ft intervals for sections greater than 500 ft for sections of the north and south pipeline completely removed. These minimum sampling locations are presented on Figure 02010-1. The CO may direct the Contractor to collect and screen additional soil samples

based on evidence of spills or past leakage. The results of the field screening confirmation samples shall be provided to the CO within 24 hours of sample collection. Results shall be provided in mg/kg of total explosives.

The field screening confirmation samples will be first used to determine if the NYSDEC clean-up criteria as listed in Table 02010-1 are exceeded at the suspect or designated sample location if the soil is to be undercut and removed for off-site disposal. If the NYSDEC clean-up criteria are exceeded, the CO will direct the Contractor to collect and analyze additional confirmation samples to better delineate the extent of contamination or direct the Contractor to remove a 6 to 12 inch lift of soil with a 5 - 10 ft radius of the sample or as directed by the CO. Following excavation of soils determined by field screening to exceed the clean-up criteria for total explosives, field screening confirmation samples will be collected at a minimum of 1 per 150 ft² area to confirm that the clean-up criteria has been met. If the concentrations are less than the specified contaminant clean-up criteria as listed in Table 02010-1, no further excavation is required.

Laboratory QA verification samples will be collected and analyzed on a minimum of 20% for explosive compounds and 10% for all other analytes of the field screening confirmation samples to verify field test results.

The TNT pipeline QA verification samples for soils underlying the removed pipeline (not at areas where leaks in the pipeline are evident) shall be analyzed for explosive related compounds. Estimated number of initial samples, required turn-around time and analytical methods are presented in Table 02010-2.

Based on volatile organics (VOCs) and semivolatile organics (semiVOCs) analysis of soils underlying the TNT pipeline during the PRDI, clean-up criteria was not exceeded in any of the soil samples. The analysis of the sediment within the pipeline indicated, however, that elevated levels of VOCs and semi VOCs are present in Sections of the TNT pipeline. At locations where spills or leakage from the pipeline is observed, confirmation and verification sampling and analysis for VOCs and semiVOCs shall be performed in addition to total explosives (confirmation samples) and explosive compounds (verification samples). In sections of the pipeline (southline at stations greater than 15+80) that are suspected of containing polychlorinated biphenyls (PCBs), the confirmation and verification samples shall also include PCB analysis. The required laboratory methods are provided in Table 02010-2.

In addition, the Contractor shall collect post-interim removal action samples to document the post-remediation conditions in sections of the TNT pipeline that have been power washed. Wipe samples will be collected from the inside wall using a remote collection method. Samples will be collected at a rate of one sample per accessible location, which will be each end to be plugged. At a minimum, one wipe sample per 250 linear feet of closed pipeline (estimated 32 total explosive samples and 16 of the other compounds) shall be taken. The samples will be analyzed at an off-site/fixed based laboratory for explosives, and additionally for TCL semivolatiles and PCBs in the southern portion of the pipeline below Station 15+80 (suspected tie-in from chemical waste sewer). Table 02010-2 provides the total estimated number of samples and required methods. The samples will be collected by wiping a 10 cm x 10 cm area of the inside of the TNT pipeline using a remote sampler. The wipe sample will be collected using a dedicated clean gauze pad that has been premoistened with methanol and a clean stainless-steel or aluminum template. A clean pair of phthalate-free gloves will be used to collect each sample.

3.1.1.1.3 PCB Contaminated Soils

Soils suspected of contamination with PCBs will be excavated at approximately STA 15+80 as specified in Section 02230: REMEDIATION OF PCB-CONTAMINATED PIPELINE LIQUIDS AND SOILS. The anticipated dimensions of the initial excavation are 10 ft by 15 ft in area, and 10 ft deep to expose

contaminated soils. The Contractor shall excavate up to these dimensions or until no visible black staining of the soil (or evidence of the oil spill) is observed, whichever comes first. Once these initial limits of the excavation have been reached, confirmation samples will be collected at a minimum of one per 75 ft² area, with a minimum of five (5) samples collected (one in each wall and one from the floor of the excavation). The samples shall be analyzed for TCL semivolatiles and pesticides/PCBs. If contaminant concentrations are less than the specified contaminant cleanup criteria as listed in Table 02010-2, no further excavation is required. If contaminant concentrations exceed any cleanup criteria, the CO shall direct the Contractor to collect additional samples to delineate the contamination or direct the Contractor to remove an additional 6 to 12 inch lift of soil from a 5 to 10 ft radius surrounding the samples. After removal of the additional lift of soil, confirmation sampling shall be repeated. This procedure shall continue until cleanup criteria are achieved.

3.1.1.2 Contractor Generated Waste Samples

Collect samples from Contractor generated waste to determine applicable transportation and disposal requirements. The Contractor shall analyze Contractor generated waste samples for the following parameters:

1. Contaminants of concern of the specific area where the waste was generated (i.e., TNT pipeline contaminants of concern if the waste was generated from TNT pipeline remediation activities).
2. Other constituents as required by the disposal facility (i.e., RCRA characteristics: corrosivity, ignitability, reactivity, TCLP, using EPA methods).

3.1.2 Sample Handling and Shipping

Sampling, sample handling, and sampling containers must be consistent with the chemicals expected, the matrix of the sample, and the planned analytical procedures. Precleaned glass sample containers with Teflon lids or equivalent are required. The Contractor shall use containers and preservatives, and adhere to holding times as shown in Table 02010-3.

The Contractor shall describe in the Sampling and Analysis Plan strict chain-of-custody procedures to be used during collection, transport, and analysis of all samples.

The Contractor shall transport samples in accordance with Department of Transportation regulations (Surface Transport and International Air Transport Association (IATA) Standards), as appropriate.

3.1.3 Sampling Documentation

Maintain a sample log containing, at a minimum, the following information:

- a. Date and time of Sampling.
- b. Sample Locations.
- c. Sample Matrix.
- d. Sample Identification Number.
- e. QA/QC Sample Identification.

- f. Analyses to be Performed.
- g. Type and Number of Sample Containers.
- h. Signatures of Individuals performing Sampling.

3.1.4 Data Reporting Deliverables

The final data deliverables for the confirmation and verification QA samples shall consist of the following:

- Cover page/laboratory chronicle.
- Chain-of-custody form.
- Sample data (including QC sample) results.
- Case narrative describing data qualifiers, sample collection, sample preparation and analysis dates, and a description of any technical problems encountered with the analysis.

The following additional information shall be provided for the verification QA samples:

- CLP report forms, or equivalent information, including QC results forms.
- Associated raw data for standards and samples.
- Associated data and forms including Initial Calibration, Continuing Calibration Verification, Surrogate Spikes and Serial Dilutions (for metals).

QC results include a method blank, matrix spike/matrix spike duplicates (MS/MSDs), a method blank spike, and the results of the field QA samples, in addition to laboratory control samples (LSCs). Sample data results including QC sample results shall also be delivered in an electronic format.

3.1.5 Contractor's Closeout Report

The Contractor shall submit a closeout report in accordance with 01300: SUBMITTALS PROCEDURES which shall consist of the following:

Introduction, Summary of Action, Final Health and Safety Report, Summary of Record Documents, Field Changes and Contract Modification, final Documents, Complete Set of all Field Test and Laboratory Analytical Results, Complete Set of All Data Validation Results, Offsite Transportation and Treatment of Materials, and Treatment of Materials, and QC Summary Report.

-- End of Section --

Table 02010-1

**Constituents of Concern and Cleanup Criteria
TNT Pipeline**

Constituent	Maximum Concentration (mg/Kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/Kg)	Minimum Field Screening Method
Explosives			
2,6-Dinitrotoluene	ND	1.0	Field kit
Nitrobenzene	ND	0.2	Field kit
Total Explosives	8% (s)	40	Field kit
Additional Contaminants After Location 15+80 (estimated tie-in from Chemical Waste Sewer)			
Volatile Organics			
Benzene	770 (s)	0.06	PID/FID
Chloroform	35 (s)	0.3	PID/FID
1,2-Dichloroethene	35 (s)	0.3	PID/FID
Ethylbenzene	3,600 (s)	5.5	PID/FID
Methylene Chloride	180 (s)	0.1	PID
4-Methyl-2-pentanone	420 (s)	1.0	PID/FID
1,1,2,2-Tetrachloroethane	240 (s)	0.6	PID/FID
Tetrachloroethene	330 (s)	1.4	PID/FID
Toluene	3,700 (s)	1.5	PID/FID
Trichloroethene	140 (s)	0.7	PID/FID
Vinyl Chloride	10 (s)	0.2	PID/FID
Xylenes	14,000 (s)	1.2	PID/FID
Semivolatile Organics			
Acenaphthene	120 (s)	50	None
Anthracene	140 (s)	50	None
Benzo(a)anthracene	44 (s)	0.224	None
Benzo(b)fluoranthene	2.8 (s)	1.1	None
Benzo(k)fluoranthene	2.7 (s)	1.1	None

Table 02010-1

**Constituents of Concern and Cleanup Criteria
TNT Pipeline
(Continued)**

Constituent	Maximum Concentration (mg/Kg)	NYSDEC* Recommended Soil Cleanup Objective (mg/Kg)	Minimum Field Screening Method
Benzo(a)pyrene	2.8 (s)	0.061	None
bis(2-Ethylhexyl)phthalate	390 (s)	50	None
Butylbenzylphthalate	670 (s)	50	None
Chrysene	110 (s)	0.04	None
Dibenzo(a,h)anthracene	.97 (s)	0.014	None
Di-n-Butylphthalate	14 (s)	8.1	None
Fluoranthene	97 (s)	50	None
Hexachlorobenzene	1,800 (s)	0.41	None
2-Methylnaphthalene	2,600 (s)	36.4	None
Naphthalene	760 (s)	13	None
Phenanthrene	1,300 (s)	50	None
Pyrene	250 (s)	50	None
Polychlorinated biphenyls (PCBs)			
Aroclor-1242	560 (s)	10	None

* NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-94-4046, "Determination of Soil Cleanup Objectives and Cleanup Levels."

- (s) Contaminant detected in pipeline sediments. All soil samples collected from around and below the pipeline were below regulatory limits.

Table 02010-2

**Confirmation and QA Split Verification Analytical Requirements
TNT Pipeline**

Section	Analytes	Estimated No. of Samples ¹	Required Turnaround Time	SW 846 EPA Test Method	Lab Required
Confirmation Samples - North and South Pipeline and Laterals - Sections completely removed	Total Explosives	28	24	Colorimetric with Spectrophotometer (8515 - Field Kit)	F
Confirmation Samples - North and South Pipelines and Laterals - In-place Closure	Total Explosives	14	24	Colorimetric with Spectrophotometer (8515 - Field Kit)	F
QA Split Verification on 20% of Confirmation Samples	Explosive Compounds	8	48	Colorimetric with Spectrophotometer (8515 - Field Kit)	I
Confirmation Samples of Suspected Spill/Leakage Areas Observed During Remediation	Total Explosives	Unknown	24	Colorimetric with Spectrophotometer (8515 - Field Kit)	F
	VOCs	Unknown	24	8010/8020 (GC)	F
	SemiVOCs	Unknown	24	8121/8100 (GC)	F
Confirmation Samples of Suspected Spill/Leakage Areas ● Below Station 15+80	Total Explosives	Unknown	24	Colorimetric with Spectrophotometer (8515 - Field Kit)	F
	VOCs	Unknown	24	8010/8020 (GC)	F
	SemiVOCs	Unknown	24	8121/8100 (GC)	F
	PCBs	Unknown	48	8080/8081 (GC)	I

02010-10

Table 02010-2

**Confirmation and QA Split Verification Analytical Requirements
TNT Pipeline
(Continued)**

Section	Analytes	Estimated No. of Samples ¹	Required Turnaround Time	SW 846 EPA Test Method	Lab Required
QA Split Verification Samples on 10% of Confirmation (VOCs and SemiVOCs) and 20% for explosives	Explosive Compounds	Unknown	48	8330 (HPLC)	I
	VOCs	Unknown	48	8260 (GC/MS)	I
	SemiVOCs	Unknown	48	8270C (GC/MS)	I
Confirmation Samples for Excavation of PCB Spill Area - Sta 15+80	SemiVOCs	10	48	8270C (GC/MS)	I
	PCBs	10	48	8082 (GC)	I
Post-Interim Removal Action (IRA) Samples for In-Place Closure Portions of TNT Pipeline	Explosive Compounds	32	4 weeks	8330 (HPLC)	I
	SemiVOCs	16	4 weeks	8260 (GC/MS)	I
	PCBs	16	4 weeks	8082 (GC)	I

F = Field Laboratory.

I = Independent Laboratory.

HPLC = High Pressure Liquid Chromatography.

¹ These estimated numbers do not include MS/MSD, duplicate, field blank and trip blank samples as required in this section and in Section 1450: CHEMICAL DATA QUALITY CONTROL.

02010-11

Table 02010-3

Sample Container Specifications, Preservatives, and Holding Times

Analyte	Minimum Sample Volume	Container	Preservative	Holding Time*
Soil/Sediment/Wipe¹				
VOCs	125 mL	Clear glass wide-mouth bottle with Teflon-lined silicone rubber cap	Cool 4 ± 2° C	14 days
SemiVOCs	250 mL	Amber glass	Cool 4 ± 2° C	14 days - extraction 40 days - analysis
Explosives	250 mL	Amber glass	Cool 4 ± 2° C	14 days - extraction 40 days - analysis
Pesticides/PCBs	250 mL	Amber glass	Cool 4 ± 2° C	14 days - extraction 40 days - analysis
Metals	250 mL	Amber glass	Cool 4 ± 2° C	14 days-extraction 40 days - analysis
Water				
VOCs	40 mL vials (2)	Clear glass with septum cap	Cool 4 ± 2° C HCl with pH < 2	14 days
SemiVOCs	1,000 mL (2)	Amber glass	Cool 4 ± 2° C	7 days - extraction 40 days - analysis
Explosives	1,000 mL	Amber glass	Cool 4 ± 2° C	7 days - extraction 40 days - analysis
Pesticides/PCBs	1,000 mL	Amber glass	Cool 4 ± 2° C	7 days - extraction 40 days - analysis
Metals	1,000 mL	plastic	HNO ₃ to pH < 2° Cool 4 ± 2° C	28 days

VOAs = Volatile organics

SemiVOCs = Semivolatile organics

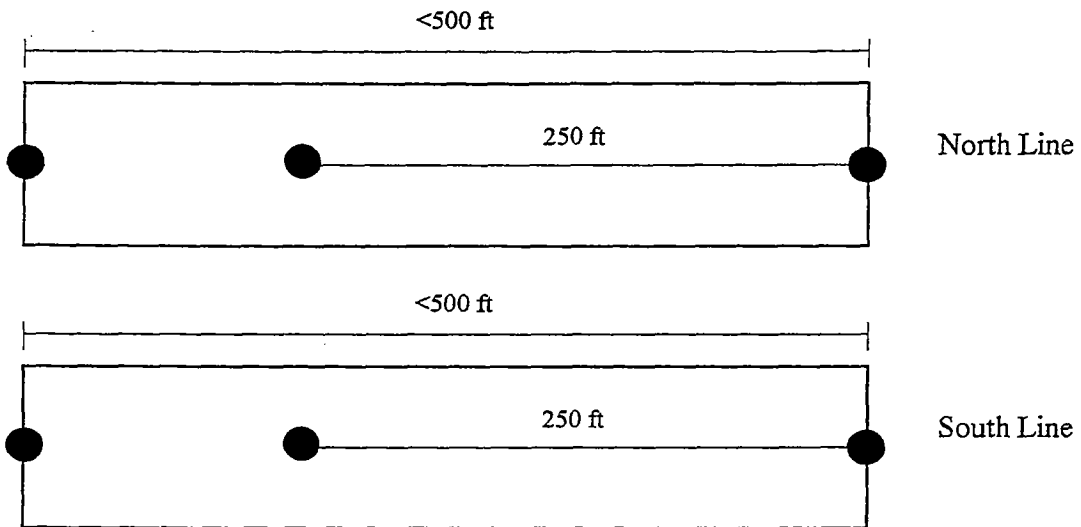
* = Holding times listed initiate at the time of sample collection.

¹ Wipe samples shall be collected using laboratory-prepared wipes and wide-mouth bottles.

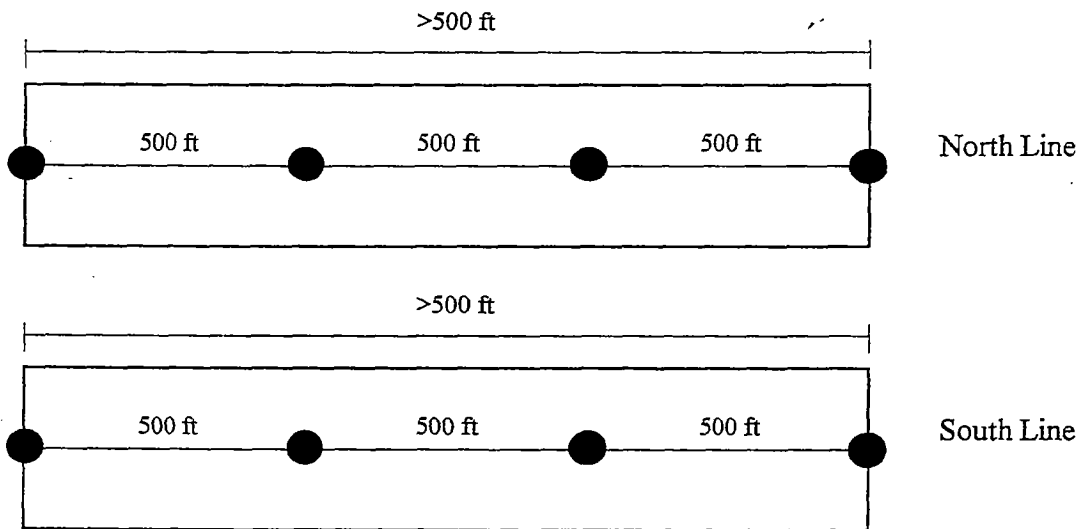
02010-12

**Figure 02010-1
TNT Pipeline Confirmation Sampling**

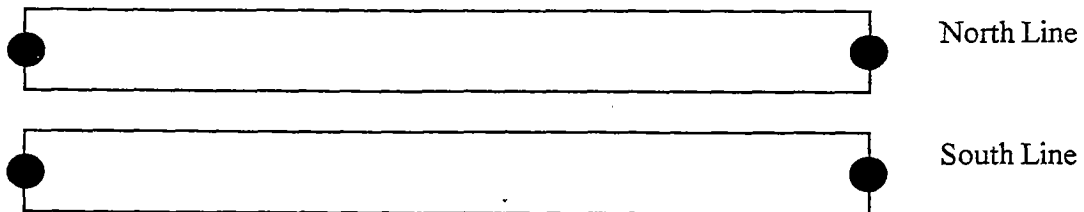
A) Confirmation sampling for complete removal of less than 500 ft TNT Pipeline sections.



B) Confirmation sampling for complete removal of greater than 500 ft TNT Pipeline sections.



C) Confirmation sampling for in-place closure sections.



Note: Figures not to scale.

● Location of confirmation sample

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LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

CEGS-02050 (September 1991)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~
~~Includes changes through Notice 3 (August 1996)~~
~~Includes Text Adjustment change 2 (coding) (March 1995)~~

Latest Notice change indicated by \&\ tokens

SECTION 02050

DEMOLITION
09/91

NOTE: This guide specification covers the
requirements for demolition and removal of
resulting debris. This guide specification is to
be used in the preparation of project specifications
in accordance with ER 1110 345 720.

PART 1 GENERAL

NOTE: This specification will be coordinated with
the appropriate sections, and the bracketed spaces
filled under paragraphs for environmental
protection, utility services, and filling of
openings.

This specification will be edited to retain
applicable requirements and/or to add necessary
requirements to meet project conditions.

1.1 REFERENCES

NOTE: Issue (date) of references included in
project specifications need not be more current than
provided by the latest change (Notice) to this guide
specification.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ENGINEERING MANUALS (EM)

EM 385-1-1

(19923 Sept 96) U.S. Army Corps of Engineers
Safety and Health Requirements Manual

1.2 GENERAL REQUIREMENTS

The work includes demolition, salvage of identified items and materials, and removal of resulting rubbish and debris. Rubbish and debris shall be removed from Government the designated property daily, unless otherwise directed, to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Contracting Officer. In the interest of occupational safety and health, the work shall be performed in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections. In the interest of conservation, salvage shall be pursued to the maximum extent possible; salvaged items and materials shall be disposed of as specified.

1.3 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary
for adequate quality control. The importance of an
item in the project should be one of the primary
factors in determining if a submittal for the item
should be required.~~

~~Indicate submittal classification in the blank space
using "GA" when the submittal requires Government
approval or "FIO" when the submittal is for
information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

~~\&SD 08 Statements&\~~

Work- ~~Demolition Plan~~; ☐ GA.

The procedures proposed for the accomplishment of the work. The procedures shall provide for safe conduct of the work, including procedures and methods to provide necessary supports, lateral bracing and shoring when required, careful removal and disposition of materials specified to be salvaged, protection of property which is to remain undisturbed, coordination with other work in progress, and timely disconnection of utility services coordinated with the property owner. The procedures shall include a detailed description of the methods and equipment to be used for each operation, and the sequence of operations in accordance with EM 385-1-1.

1.4 DUST CONTROL

The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area.

Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution.

1.5 PROTECTION

1.5.1 Protection of Personnel

During the demolition work the Contractor shall continuously evaluate the condition of the structure being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, may be allowed to remain standing without additional bracing, shoring, or lateral support until demolished. The Contractor shall ensure that no elements determined to be unstable are left unsupported and shall be responsible for placing and securing bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.2 Protection of Existing Property

Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Government; any damaged items shall be repaired or replaced as approved by the Contracting Officer. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.5.3 ~~Protection From the Weather~~

~~The interior of buildings to remain and salvageable materials and equipment shall be protected from the weather at all times.~~

1.5.4 ~~Protection of Trees~~

~~Trees within the project site which might be damaged during demolition and which are indicated to be left in place shall be protected by a 1.83 m (6 foot) (6 foot) high fence. The fence shall be securely erected a minimum of 1.5 m (5 feet) from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the work under this contract shall be replaced in kind or as approved by the Contracting Officer.~~

1.5.5 Environmental Protection

The work shall comply with the requirements of Section 01561.

1.6 BURNING

The use of burning at the project site for the disposal of refuse and debris [will not be permitted][will be permitted in the area located and between the hours of [] and []].

1.7 USE OF EXPLOSIVES

Use of explosives ~~[will]~~ [will not] be permitted.

1.8 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

Area	Date
Former Wastewater Treatment Plant	

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 EXISTING STRUCTURES

The existing woodframe structure/superstructure indicated on the drawings as the former wastewater treatment plant building, and shown on the attached photographs, shall be demolished removed to grade-[to top of foundation walls] to [] meter (feet) below grade. Interior walls, other than retaining walls and partitions, shall be removed to [] meters (feet) below grade or to top of concrete slab on ground. Basement slabs shall be broken up to permit drainage. Sidewalks, curbs, gutters and street light bases shall be removed as indicated to allow for access to wet well area which is the terminus of the north and south TNT waste pipeline. Following demolition and disposal of the wastewater treatment plant, the Contractor shall remove and properly dispose of any liquids in the wet well and concrete tanks below and adjacent to the wastewater treatment plant building as shown on the drawings, and in accordance with Section 02141: DEWATERING LIQUIDS AND HANDLING. If sludge sediment is present in the well and/or concrete tank, the Contractor shall obtain a sample from each well and tank and analyze the samples to determine proper disposal requirements. The Contractor shall then remove and disposed of the sludge/sediments unless the results indicate the material to be below the NYSDEC clean-up criteria. These activities shall be coordinated with the flushing and closure of the TNT pipeline such that these wet wells can be used as a sump for flushing activities. Once the wet well/concrete tank of the structure is dewatered and the sediment/sludge removed, the concrete bottom shall be broken up to allow precipitation to drain out and prevent ponding.

3.2 UTILITIES

~~Disconnection of utility services, with related meters and equipment, are specified in Section []]. Existing utilities shall be removed as indicated. After removal of sediments and sludges as discussed in 3.1, the Contractor shall then seal off any pipe that enters into the wet well and pond with a minimum 3 ft. concrete grout plug. When utility lines are encountered that are not indicated on the drawings, the Contracting Officer shall be notified prior to further work in that area.~~

3.3 FILLING

Holes, open basements, wet wells and concrete tanks associated with the former wastewater treatment plant, and other hazardous openings shall be filled in accordance with Section [] 02222 [as follows: []]. After all pipes have been plugged the Contractor shall backfill under compaction control the wet well and concrete tanks with clean soil, grade and vegetate in accordance with Sections 02222, 02210, and 02935. The area that is backfilled shall be graded to establish a minimum positive 4% grade away from the wet well and tanks.

3.4 DISPOSITION OF MATERIAL

Title to material and equipment to be demolished, ~~except Government salvage and historical items,~~ is vested in the Contractor upon receipt of notice to proceed. The Government will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.4.1 Salvageable Items and Material

Contractor shall salvage items and material to the maximum extent possible.

3.4.1.1 Material Salvaged for the Contractor

Material salvaged for the Contractor shall be stored as approved by the Contracting Officer and shall be removed from ~~Government the site~~ property before completion of the contract. ~~Material salvaged for the Contractor shall not be sold on the site.~~

~~3.4.1.2 Items Salvaged for the Government~~

~~Salvaged items to remain the property of the Government shall be removed in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage shall be repaired or replaced to match existing items. Containers shall be properly identified as to contents. The following items reserved as property of the Government shall be delivered to the areas designated: [].~~

~~3.4.1.3 Items Salvaged for the Using Service~~

~~The following items reserved as property of the using service will be removed prior to commencement of work under this contract: [].~~

~~3.4.1.4 Historical Items~~

~~Historical items shall be removed in a manner to prevent damage. The following historical items shall be delivered to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.~~

3.4.2 Unsalvageable Material

Concrete, masonry, and other noncombustible material, except concrete permitted to remain in place, shall be disposed of by backfilling these material in the existing wet well and concrete ponds ~~in the disposal area located [].~~ The fill in the disposal area shall remain below elevation [] and after disposal is completed, the disposal area shall be uniformly graded to drain at a minimum 4% grade. Combustible material shall be disposed of [in a permitted landfill located []] [off the site] [by burning or recycled into mulch or other reuse options approved by the Contracting Officer].

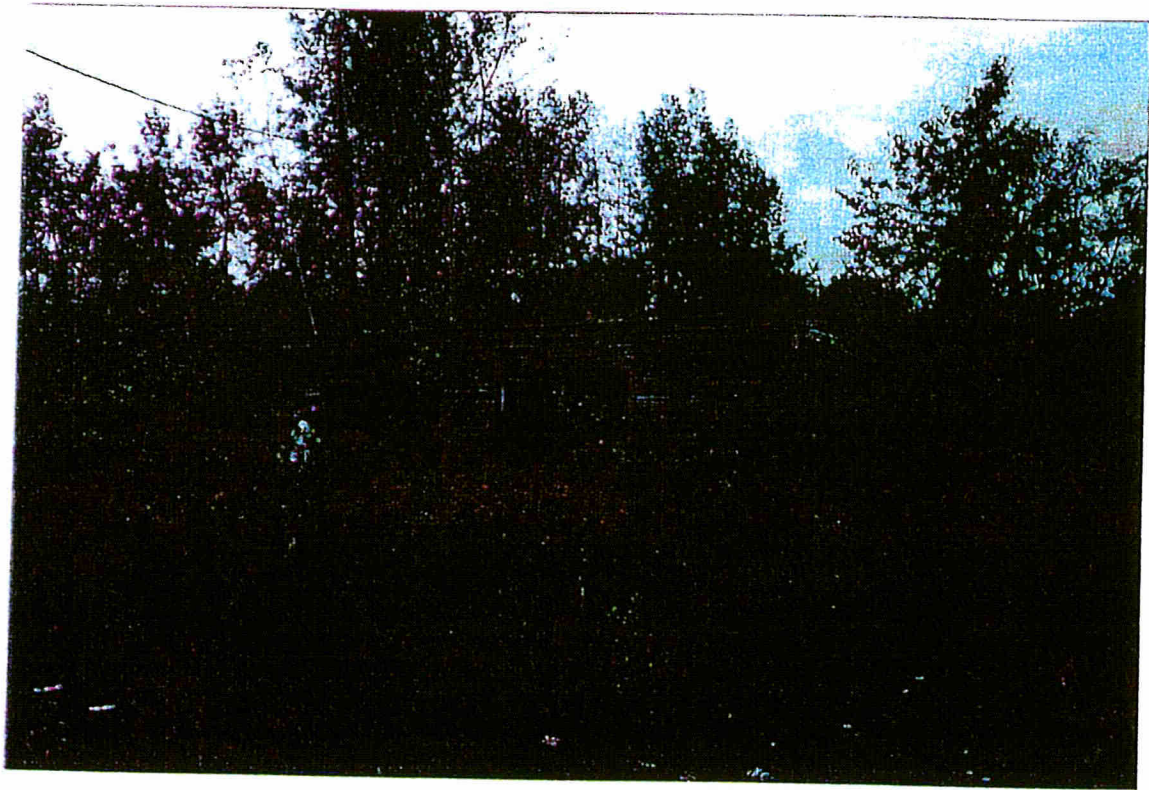
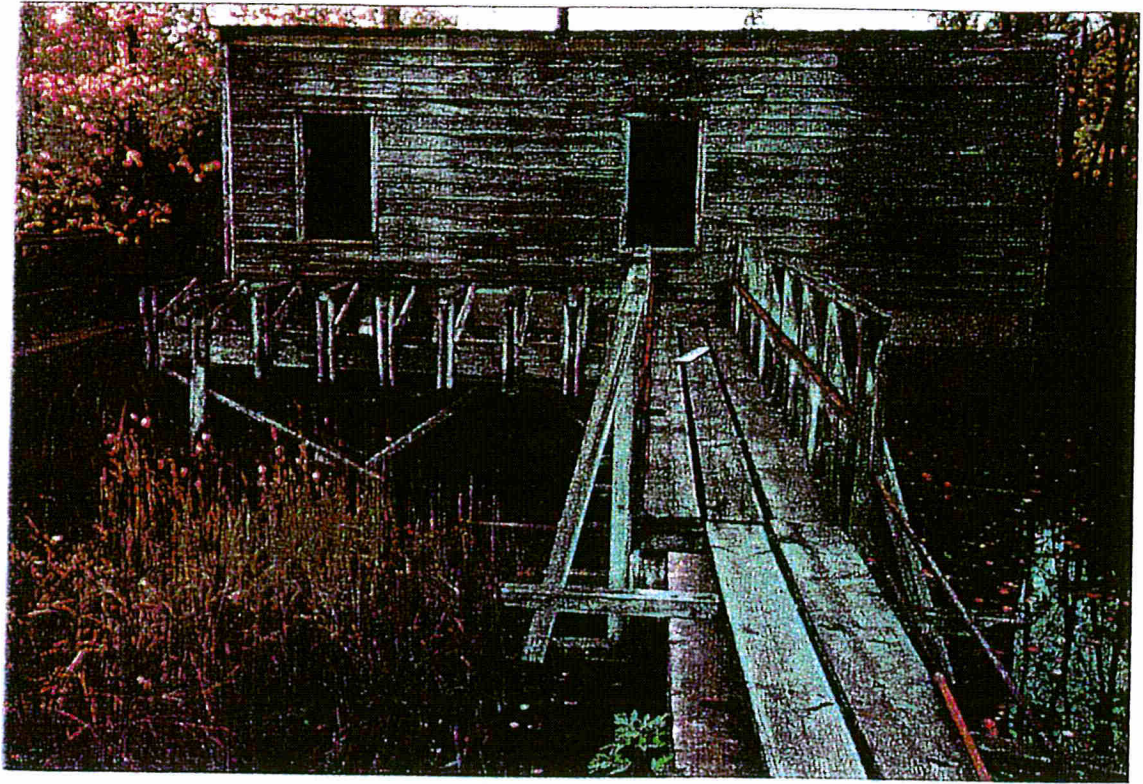
3.5 CLEAN UP

Debris and rubbish shall be removed from basement and similar excavations. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

-- End of Section --

ATTACHMENT 1

PHOTOGRAPHS OF WASTEWATER TREATMENT PLANT TO BE DEMOLISHED



LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02110 (July 1989)

Superseding
CEGS-02100 (August 1983)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION
Includes note relocation Special change (August 1995)

Includes changes through Notice 1 (April 1994)

Includes Text Adjustment change 2 (March 1993) Latest Notice Change indicated by \&\ tokens

SECTION 02110
CLEARING AND GRUBBING
07/89

~~NOTE: This guide specification covers the requirements for clearing and grubbing of the construction site. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.~~

PART 1 GENERAL

1.1 REFERENCES (Not Applicable)

~~NOTE: Paragraph 1.2 REFERENCES (Not Applicable) is required in any CEGS which does not cite references in the text. This is necessary to permit SPECSINTACT to perform the automated operations pertaining to references for the section and the project. However, if no references are added to the section when preparing project specifications, the paragraph should not be included in the final project specification.~~

1.2 DEFINITIONS

~~NOTE: \& When this specification is used for hazardous waste site remediations, this paragraph should define what materials generated from clearing, grubbing, and tree removal are contaminated and what materials are non-contaminated. The decision on how to define contaminated and non-contaminated materials must be made by the appropriate regulatory authorities and documented in the design analysis.\&~~

1.2.1 Clearing

Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, and rubbish occurring in the areas to be cleared.

1.2.2 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots larger than 75 millimeters (3 inches) in diameter, and matted roots from the designated grubbing areas.

1.2.3 Materials from Potentially Contaminated Remediation Areas

The results of the pre-design investigation and previous investigation did not detect concentrations of suspected contaminant above the soil screening criteria in surficial soils above the TNT pipeline. However, due to the potential of contamination from previous site activities, soils and roots containing significant soils removed as part of the clearing and grubbing operations shall be handled in accordance with the procedures for excavated soils above the pipeline or adjacent to the chemical waste sewer line lift stations specified in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINE.

Vegetation removed above the ground surface from remediation areas shall be handled as a non-hazardous waste unless directed to handle in a different manner by the Contracting Officer.

1.2.4 Non-Hazardous Materials

To be determined

1.3 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-18 Records
Materials Other Than Salable Timber; [GA].

Written permission to dispose of such products on private property shall be filed with the Contracting Officer.

1.4 MEASUREMENT

NOTE: Paragraph Measured Clearing and Grubbing, is an option to separate paragraphs Measured Clearing, and Measured Grubbing.

1.4.1 Measured Clearing

Clearing will be measured in acres of clearing actually performed. Areas of light brush, shrubs, and other vegetation that can be cut with a brush hook, scythe, or mowing machine will not be measured as clearing.

1.4.2 Measured Grubbing

Grubbing will be measured in acres of grubbing actually performed. Areas where tree roots and timber are less than 75 millimeters (3 inches) in diameter and areas where roots of brush, shrubs, and other vegetation can be removed by plowing will not be measured as grubbing.

1.4.3 Measured Clearing and Grubbing

Clearing and grubbing will be measured in hectares (acres) of clearing and grubbing actually performed.

1.4.4 Measured Tree Removal

NOTE: Include this paragraph when removal of only scattered trees is required, and payment by the hectare (acre) would result in excessive cost to the Government. Add a schedule similar to the following:

To 180 millimeters (\&3&\ to 7 inches) diameter 200 to 280 millimeters (8 to 11 inches) diameter 300 to 580 millimeters (12 to 23 inches) diameter 600 to 890 millimeters (24 to 35 inches) diameter 910 millimeters (36 inches) or larger diameter.

Tree removal will be measured by the number of trees of stated sizes removed from areas outside the clearing and grubbing areas. The size will be determined by the average diameter of the trunk 1 meter (4 feet) above the ground line. The size of stumps designated for removal as trees will be determined by the diameter of the trunk 1 meter (4 feet) above the ground line. The diameter will be measured to the nearest 25 millimeter. (full inch.)

1.5 PAYMENT

NOTE: Paragraph Paid Clearing and Grubbing, is an option to separate paragraphs Paid Clearing, and Paid Grubbing.

1.5.1 Paid Clearing

Payment for clearing will be made at the contract unit price per hectare (acre) for clearing, and this price shall constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work specified herein.

1.5.2 Paid Grubbing

Payment for grubbing will be made at the contract unit price per hectare (acre) for grubbing, and this price shall constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work specified herein.

1.5.3 Paid Clearing and Grubbing

Payment will be made at the contract unit price for clearing and grubbing, and this price shall constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work specified herein.

1.5.4 Paid Tree Removal

NOTE: Coordinate this paragraph with paragraph Measured Tree Removal.

Payment for tree removal will be made at the contract unit price for removing trees, or stumps designated as trees, that are outside the area designated for clearing or grubbing in accordance with the following schedule of sizes:

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING

~~NOTE: Where loose rocks, boulders, or rock piles are present on the surface of the areas designated to be cleared, appropriate provisions will be inserted to provide for the disposal of such material. Where stone occurs that can be economically used in the project, provision will be made for the proper stockpiling of such stone in a designated area adjacent to the location of its intended use. If only minor structures will be encountered, the last sentence will be included. Where large structures are to be demolished, the requirements of this work will be covered in Section 02050 DEMOLITION and the last sentence will be deleted. \& Herbicides should be used with caution on hazardous waste sites because they can contribute to site contamination. If a herbicide is used to control vegetative growth, one should be specified which will not contribute to site contamination.&\~~

Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be cut off flush with or below the original ground surface, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 40 millimeters (1-1/2 inches) or more in diameter and shall be trimmed of all branches the heights indicated or directed. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Cuts more than 40 millimeters (1-1/2 inches) in diameter shall be painted with an approved tree-wound paint. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require. {Clearing shall also include the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work.}

3.2 GRUBBING

~~NOTE: \& For hazardous waste sites, the amount of grubbing performed in contaminated areas should be minimized due to potential added costs for disposal of contaminated materials and health and safety concerns.&\~~

Material to be grubbed, together with logs and other organic or metallic debris not suitable for foundation purposes, shall be removed to a depth of not less than 0.5 meters (18 inches) below the original surface level of the ground in areas indicated to be grubbed and in areas indicated as construction areas under this contract, such as areas for buildings, and areas to be paved. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground. Grubbing shall not be performed in areas to be excavated except for access purposes.

3.3 TREE REMOVAL

Where indicated or directed, trees and stumps that are designated as trees shall be removed from areas outside those areas designated for clearing and grubbing. This work shall include the felling of such trees and the removal of their stumps and roots as specified in paragraph GRUBBING. Trees shall be disposed of as specified in paragraph DISPOSAL OF MATERIALS.

3.4 DISPOSAL OF MATERIALS

~~NOTE: \& When this specification is being used for the remediation of hazardous waste sites, this paragraph should define how both contaminated and non-contaminated materials will be disposed of. As an alternative, disposal requirements could be outlined in a separate section such as SECTION: ENVIRONMENT PROTECTION. The design analysis should document how both contaminated and non-contaminated materials will be disposed of.&\~~

The Contractor shall dispose of all wastes generated as part of the Interim Response Action - Phase I Component 1 in accordance with Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.4.1 (Salable Timber) Not Applicable

~~NOTE: When the timber that can be obtained from felled trees is not of sufficient commercial value to warrant salvaging, this paragraph may be deleted, and the Contractor permitted either to make use of or to dispose of such timber in an approved manner. When the felled timber has a distinct commercial value, the disposal of such timber may be left to the Contractor where the Contracting Officer has reasonable assurance that the bidders will consider the value of the salvageable timber in estimating their bids. An applicable length will be inserted in the blank. \&At hazardous waste sites, timber removed from areas of contamination is normally not salable due to liability concerns&\.~~

~~All felled timber from which saw logs, pulpwood, posts, poles, ties, mine props, or cordwood can be produced shall be considered as salable timber, and shall be trimmed of limbs and tops, sawed into salable lengths of [] meters, ([] feet,) and stockpiled at locations as directed. The disposal of the stockpiled timber will be by the Government.~~

3.4.2 Materials Other Than Salable Timber

~~NOTE: When burning is not allowed, the last three sentences of this paragraph shall be deleted.~~

~~Logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations, except for salable timber, shall not be disposed of on-site [in the designated waste disposal area] [outside the limits of Government controlled land at the Contractor's responsibility] [by burning], except when otherwise approved in writing. Such permission will state the conditions covering the disposal of such products and will also state the areas in which they may be placed. [Refuse to be burned shall be burned at locations as directed and in a manner to prevent damage to existing structures and appurtenances, construction in progress, trees, and other vegetation. The Contractor shall be responsible for compliance with all Federal and State laws and regulations and with reasonable practice relative to the building of fires. Burning or other disposal of refuse and debris and any accidental loss or damage attendant thereto shall be the Contractor's responsibility.]~~

-- End of Section --

~~DEPARTMENT OF THE ARMY~~
~~U.S. ARMY CORPS OF ENGINEERS~~

~~GUIDE SPECIFICATIONS ONLY~~
~~CEGS-02120 (October 1996)~~

~~LAKE ONTARIO ORDNANCE WORKS~~
~~LEWISTON AND PORTER, NY~~

~~GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION~~

SECTION 02120

TRANSPORTATION AND DISPOSAL OF HAZARDOUS
AND NON-HAZARDOUS MATERIALS
10/96

~~NOTE: This guide specification covers the~~
~~requirements for transportation and disposal of~~
~~hazardous material. This guide specification is~~
~~to be used in the preparation of project~~
~~specifications in accordance with ER 1110 345 720.~~

PART 1 GENERAL

~~NOTE: This specification was developed for large~~
~~management contracts where there is a technical~~
~~evaluation in the selection process. For small~~
~~purchases, portions of this specification may be~~
~~applicable, but should be closely considered. This~~
~~specification should be used in conjunction with the~~
~~separate asbestos and PCB management specifications~~
~~when work involves these hazardous materials.~~

~~For other than remedial action, corrective action,~~
~~or disposal of ammunition contract, add DFAR clause~~
~~252.223. 7005~~

~~If work involves only hazardous materials and not~~
~~hazardous wastes, submittals regarding the hazardous~~
~~waste management plan, the EPA Biennial and State~~
~~Annual Reports, exceptions reports, certificates of~~
~~disposal, and records of inspection may be removed~~
~~by the designer.~~

~~Regarding pre established spill reporting~~
~~procedures, the designer should consult CEMP RT~~
~~memorandum of 20 July 1995, Subject: Spill~~
~~Reporting Procedures for USACE Personnel Involved in~~
~~HTRW Projects.~~

1.1 REFERENCES

NOTE: Issue (date) of references included in
project specifications need not be more current than
provided by the latest change (Notice) to this guide
specification.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Permit Program
40 CFR 279	Standards for the Management of Used Oil 40 CFR 300 National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings
49 CFR 178	Specifications for Packagings

1.2 SUBMITTALS

NOTE: Submittals must be limited to those necessary
for adequate quality control. The importance of an
item in the project should be one of the primary
factors in determining if a submittal for the item
should be required.
Indicate submittal classification in the blank space
using "GA" when submittal requires Government
approval or "FIO" when the submittal is for
information only.

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300
SUBMITTAL PROCEDURES:

SD-1 Data

On-site Non-Hazardous Waste Management; GA.
Off-site Hazardous Waste Management; GA.
On-site Hazardous Waste Management; GA.
Off-site Non-Hazardous Waste Management; GA.

Prior to start of work, a plan detailing the manner in which hazardous and non-hazardous wastes shall be managed.

SD-09 Reports

Recordkeeping; GA.

Information necessary to file state annual or EPA biennial reports for all hazardous waste transported, treated, stored, or disposed of under this contract. The Contractor shall not forward these data directly to the regulatory agency but to the Contracting officer at the specified time.

The submittal shall contain all the information necessary for filing of the formal reports in the form and format required by the governing Federal or state regulatory agency. A cover letter shall accompany the data to include the contract number, Contractor name, and project location.

Spill Response; FIO.

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), or pollutant or contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Contracting Officer immediately. If the spill exceeds a reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting to the Contracting Officer.

Exception Reports; GA.

In the event that a manifest copy documenting receipt of hazardous waste at the treatment, storage, and disposal facility is not received within 35 days of shipment initiation, the Contractor shall prepare and submit an exception report to the Contracting Officer within 37 days of shipment initiation.

SD-13 Certificates

Qualifications; FIO.

Copies of the current certificates of registration issued to the Contractor and/or subcontractors or written statements certifying exemption from these requirements.

Off-Site Policy Compliance Certification; ☐ FIO.

A letter certifying that EPA considers the facilities to be used for all off-site disposal to be acceptable in accordance with the Off-Site policy in 40 CFR 300, Section .440. This certification shall be provided for wastes from Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 et seq., sites as well as from Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq., responses.

See Attachment 1 sample certification at the end of this section.

Certificates of Disposal; FIO.

Certificates documenting the ultimate disposal of hazardous wastes, polychlorinated biphenyls (PCBs), and/or asbestos within [180] ☐ days of initial shipment. Receipt of these certificates will be required for final payment.

Packagings Certification; GA.

All transportation related shipping documents to the [Contracting Officer] ☐, including [draft hazardous waste manifests] [draft land disposal restriction notifications] [draft asbestos waste shipment records] [draft manifests for PCBs] [draft bill of lading for hazardous materials] [lists of corresponding proposed labels, packages, marks, and placards to be used for shipment] [waste profiles] [supporting waste analysis documents], for review a minimum of 2 [14] ☐ days prior to anticipated pickup.

Packaging assurances shall be furnished prior to transporting hazardous material; ["generator copies" of hazardous waste manifests] [land disposal restriction notifications] [asbestos waste shipment records] ["generator copies" of manifests used for initiating shipments of PCBs] [used oil invoices/shipment records] [bill of lading] [supporting waste analysis documents] shall be furnished when shipments are originated; and "receipt copies" of asbestos waste shipment records at the designated disposal facility shall be furnished not later than 35 days after acceptance of the shipment.

SD-18 Records

Notices of Non-Compliance and Notices of Violation; FIO.

Notices of non-compliance or notices of violation by a Federal, state, or local regulatory agency issued to the Contractor in relation to any work performed under this contract. The Contractor shall immediately provide copies of such notices to the Contracting Officer. The Contractor shall also furnish all relevant documents regarding the incident and any information requested by the Contracting Officer, and shall coordinate its response to the notice with the Contracting Officer or his designated representative prior to submission to the notifying authority. The Contractor shall also furnish a copy to the Contracting Officer of all documents submitted to the regulatory authority, including the final reply to the notice, and all other materials, until the matter is resolved.

1.3 QUALIFICATIONS

1.3.1 Transportation and Disposal Coordinator

The Contractor shall designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including but not limited to accurate identification and classification of hazardous waste and hazardous materials, and non-hazardous waste; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, hazardous waste manifests, asbestos waste shipment records, PCB manifests, bill of lading, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of hazardous waste.

1.3.2 Training

The Contractor's hazardous materials employees shall be trained, tested, and certified to safely and effectively carry out their assigned duties in accordance with Section 01110 SAFETY, HEALTH, AND EMERGENCY RESPONSE (HTRW/UST). The Contractor's employees transporting hazardous materials or preparing hazardous materials for transportation shall be trained, tested, and certified in accordance with 49 CFR 172.

1.3.3 Certification

The Contractor and/or subcontractors transporting hazardous materials shall possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. Department of Transportation, when required by 49 CFR 107, Subpart G.

1.4 LAWS AND REGULATIONS REQUIREMENTS

Work shall meet or exceed the minimum requirements established by Federal, state, and local laws and regulations which are applicable. These requirements are amended frequently and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, the Contractor shall notify the Contracting Officer immediately.

1.5 DEFINITIONS

a. Hazardous Material. A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act, 49 U.S.C. Appendix Section 1801 et seq. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections .101 and .102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173. EPA designated hazardous wastes are also hazardous materials.

b. Hazardous Waste. A waste which meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

PART 2 PRODUCTS

2.1 MATERIALS

The Contractor shall provide all of the materials required for the packaging, labeling, marking, placarding and transportation of hazardous wastes and hazardous materials and non-hazardous wastes

in conformance with Department of Transportation standards. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

2.1.1 Packagings

The Contractor shall provide ~~[bulk]~~ ~~[non-bulk]~~ [bulk and non-bulk] containers for packaging hazardous materials/wastes consistent with the authorizations referenced in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 8. Bulk and non-bulk packaging shall meet the corresponding specifications in 49 CFR 173 referenced in the Hazardous Materials Table, 49 CFR 172, Section .101. Each packaging shall conform to the general packaging requirements of Subpart B of 49 CFR 173, to the requirements of 49 CFR 178 at the specified packing group performance level, to the requirements of special provisions of column 7 of the Hazardous Materials Table in 49 CFR 172, Section .101, and shall be compatible with the material to be packaged as required by 40 CFR 262. The Contractor shall also provide other packaging related materials such as materials used to cushion or fill voids in overpacked containers, etc. Sorbent materials shall not be capable of reacting dangerously with, being decomposed by, or being ignited by the hazardous materials being packaged.

Additionally, sorbents used to treat free liquids to be disposed of in landfills shall be non-biodegradable as specified in 40 CFR 264, Section .314.

2.1.2 Markings

The Contractor shall provide markings for each hazardous material/waste package, freight container, and transport vehicle consistent with the requirements of 49 CFR 172, Subpart D and [40 CFR 262, Section .32 (for hazardous waste)] [40 CFR 761, Section .45 (for PCBs)] [40 CFR 61, Section .149(d) (for asbestos)]. Markings must be capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.3 Labeling

The Contractor shall provide primary and subsidiary labels for hazardous materials/wastes consistent with the requirements in the Hazardous Materials Table in 49 CFR 172, Section .101, Column 6. Labels shall meet design specifications required by 49 CFR 172, Subpart E including size, shape, color, printing, and symbol requirements. Labels shall be durable and weather resistant and capable of withstanding, without deterioration or substantial color change, a 180 day exposure to conditions reasonably expected to be encountered during container storage and transportation.

2.1.4 Placards

For each off-site shipment of hazardous material/waste, the Contractor shall provide primary and subsidiary placards consistent with the requirements of 49 CFR 172, Subpart F. Placards shall be provided for each side and each end of bulk packaging, freight containers, transport vehicles, and rail cars requiring such placarding. Placards may be plastic, metal, or other material capable of withstanding, without deterioration, a 30 day exposure to open weather conditions and shall meet design requirements specified in 49 CFR 172, Subpart F.

2.1.5 Spill Response Materials

The Contractor shall provide spill response materials including, but not limited to, containers, adsorbent, shovels, and personal protective equipment. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of material being handled.

2.2 EQUIPMENT AND TOOLS

The Contractor shall provide miscellaneous equipment and tools necessary to handle hazardous materials and hazardous wastes in a safe and environmentally sound manner.

PART 3 EXECUTION

3.1 ON-SITE HAZARDOUS WASTE MANAGEMENT

~~NOTE: When work on a site is being performed pursuant to the authorities of CERCLA, it may be eligible for the permit waiver of CERCLA Section 121(c) such that accumulation time restrictions or other requirements may not be applicable. In that case the designer, with assistance from agency counsel as necessary, should determine whether this paragraph requires revision accordingly.~~

These paragraphs apply to Government owned waste only. Contractors are prohibited by 10 U.S.C. 2692 from storing contractor owned waste on site for any length of time. The Contractor shall be responsible for ensuring compliance with all Federal, state, and local hazardous waste laws and regulations and shall verify those requirements when preparing reports, waste shipment records, hazardous waste manifests, or other documents. The Contractor shall identify hazardous wastes using criteria set forth in 40 CFR 261 or all applicable state and local laws, regulations, and ordinances. When accumulating hazardous waste on-site, the Contractor shall comply with generator requirements in [40 CFR 262] [and] [any applicable state or local law or regulations]. On-site accumulation times shall be restricted to applicable time frames referenced in [40 CFR 262, Section .34] [and] [any applicable state or local law or regulation]. Accumulation start dates shall commence when waste is first generated (i.e. containerized or otherwise collected for discard). The Contractor shall only use containers in good condition and compatible with the waste to be stored. The Contractor shall be responsible for ensuring containers are closed except when adding or removing waste. The Contractor shall be responsible for immediately marking all hazardous waste containers with the words "hazardous waste" and other information required by [40 CFR 262, Section .32] [and] [any applicable state or local law or regulation] as soon as the waste is containerized. An additional marking shall be placed on containers of "unknowns" designating the date sampled, and the suspected hazard. The Contractor shall be responsible for inspecting containers for signs of deterioration and shall be responsible for responding to any spills or leaks. The Contractor shall inspect all hazardous waste areas weekly and shall provide written documentation of the inspection. Inspection logs will contain date and time of inspection, name of individual conducting the inspection, problems noted, and corrective actions taken.

3.1.1 Hazardous Waste Classification

~~NOTE: If insufficient information exists to make a waste classification determination, the designer should develop contract clauses to provide for additional analysis.~~

The Contractor, in consultation with the {Contracting Officer}{waste generator} and CWM [____], shall identify all waste codes applicable to each hazardous waste stream based on requirements in 40 CFR 261 or any applicable state or local law or regulation. The Contractor shall also identify all applicable treatment standards in 40 CFR 268 and state land disposal restrictions and shall make a determination

as to whether or not the waste meets or exceeds the standards. Waste profiles, analyses, classification and treatment standards information shall be submitted to Contracting Officer for review and approval.

3.1.2 Management Plan

The Contractor shall prepare a plan detailing the manner in which hazardous wastes shall be managed and describing the types and volumes of hazardous wastes anticipated to be managed as well as the management practices to be utilized. The plan shall identify the method to be used to ensure accurate piece counts and/or weights of shipments; shall identify waste minimization methods; shall propose facilities to be utilized for treatment, storage, and/or disposal; shall identify areas on-site where hazardous wastes are to be handled; shall identify whether transfer facilities are to be utilized; and if so, how the wastes will be tracked to ultimate disposal.

3.2 OFF-SITE HAZARDOUS WASTE MANAGEMENT

The Contractor shall use RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. Off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air) shall not be used.

3.2.1 Description of TSD Facility and Transporter

The Contractor shall provide the Contracting Officer with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Hazardous Waste Management Plan for approval prior to waste disposal.

3.2.2 Status of the Facility

Facilities receiving hazardous waste must be permitted in accordance with 40 CFR 270 or operating under interim status in accordance with 40 CFR 265 requirements or must be permitted by an authorized state program. Additionally, prior to using a TSD Facility, the Contractor shall contact the EPA Regional Off-site Coordinator specified in 40 CFR 300, Section .440, to determine the facility's status and document all information necessary to satisfy the requirements of the EPA Off-Site policy and furnish this information to the Contracting Officer.

3.2.3 Packagings Certification

Prior to shipment of any hazardous material off-site, the Contractor's TDC shall provide written certification to the Contracting Officer that hazardous materials have been properly packaged, labeled, and marked in accordance with Department of Transportation and EPA requirements.

3.2.4 Transportation

The Contractor shall use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series.

The Contractor shall acquire manifests in accordance with the hierarchy established in 40 CFR 262, Section .21. The Contractor shall prepare hazardous waste manifests for each shipment of hazardous waste shipped off-site. Manifests shall be completed using instructions in 40 CFR 262, Subpart B and any applicable state or local law or regulation.

Manifests and waste profiles shall be submitted to Contracting Officer for review and approval. The Contractor shall prepare land disposal restriction notifications as required by 40 CFR 268 or any applicable state or local law or regulation for each shipment of hazardous waste.

Notifications shall be submitted with the manifest to the Contracting Officer for review and approval. ~~When the additional cost of sending a qualified USACE representative to a remote location for a small clean up project is unwarranted, the option of requiring the on-site Contractor to sign the manifests on behalf of the generator is permitted and should be considered. This option shall only be exercised on a project specific basis, if prior to the solicitation process, written authorization of the customer and approval of the Chief, Construction Division at the executing district has been obtained, and the technical provisions of the contract solicitation provide competing contractors notice of the requirement.~~

3.2.5 Treatment and Disposal of Hazardous Wastes

The hazardous waste shall be transported to an approved hazardous waste treatment, storage, or disposal facility within {90}{ } days of the accumulation start date on each {container}{ }. The Contractor shall ship hazardous wastes only to facilities which are properly permitted to accept the hazardous waste or operating under interim status. The Contractor shall ensure wastes are treated to meet land disposal treatment standards in 40 CFR 268 prior to land disposal. The Contractor shall propose TSD facilities via submission of the Hazardous Waste Management Plan, subject to the approval of the Contracting Officer.

3.3 HAZARDOUS MATERIALS MANAGEMENT

The Contractor, in consultation with the {Contracting Officer}{generator}{ } and CWM, shall evaluate prior to shipment of any material off-site whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etcetera, as described below.

3.3.1 Identification of Proper Shipping Names

The Contractor shall use 49 CFR 172, Section .101 to identify proper shipping names for each hazardous material (including hazardous wastes) to be shipped off-site. Proper shipping names shall be submitted to the Contracting Officer in the form of draft shipping documents for review and approval.

3.3.2 Packaging, Labeling, and Marking

The Contractor shall package, label, and mark hazardous materials/wastes using the specified materials and in accordance with the referenced authorizations. The Contractor shall mark each container of hazardous waste of 440 L (110 gallons) or less with the following:

"HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Generator's name _____

Manifest Document Number _____".

3.3.3 Shipping Documents

The Contractor shall ensure that each shipment of hazardous material sent off-site is accompanied by properly completed shipping documents.

3.3.3.1 PCB Waste Shipment Documents

The Contractor shall prepare hazardous waste manifests for each shipment of PCB waste shipped off-site. Manifests will be completed using instructions in 40 CFR 761, Sections .207 and .208 and all other applicable requirements. Documents shall be submitted to Contracting Officer for review and approval.

3.3.3.2 Asbestos Waste Shipment Documents

The Contractor shall prepare waste shipment records as required by 40 CFR 61 for shipments of asbestos. Waste shipment records shall be submitted to the Contracting Officer for review and approval. Waste shipment records shall be signed by the Contractor.

3.3.3.3 Other Hazardous Material Shipment Documents

~~NOTE: The designer should determine whether bill of~~
~~lading certifications will be signed by the~~
~~Government or the Contractor. This determination~~
~~should be based on whether the Government or the~~
~~Contractor is responsible for classifying,~~
~~packaging, marking, labeling, and placarding the~~
~~shipment.~~

The Contractor shall prepare a bill of lading for each shipment of hazardous material which is not accompanied by a hazardous waste manifest or asbestos waste shipment record which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, ~~and 40 CFR 279 if shipping used oil~~ and any applicable state or local law or regulation, and shall be submitted to the Contracting Officer for review and approval. For laboratory samples and ~~treatability study samples~~, the Contractor shall prepare bills of lading and other documentation as necessary to satisfy conditions of the sample exclusions in 40 CFR 261, Section .4(d) and (e) and any applicable state or local law or regulation. Bill of ladings requiring shipper's certifications shall be signed by the ~~[Government]~~ [Contractor].

3.4 NON-HAZARDOUS WASTE MANAGEMENT

The Contractor shall be responsible for ensuring compliance with all Federal, State, and local solid waste laws and regulations and shall verify those requirements when preparing reports or other documents. Materials not meeting the definition of Hazardous Waste shall be disposed at a NYSDEC 360 approved facility in accordance with 6NYSDEC360.2 Landfills, 6NYSDEC360.7 Construction and Demolition Debris Landfills, and other applicable laws and regulations.

The Contractor shall prepare shipping papers in accordance with Department of Transportation and other applicable regulations. The shipping papers shall be submitted to the Contracting Officer for review and approval.

3.4.5 OBTAINING EPA ID NUMBERS

The Contractor shall complete EPA Form 8700-12, Notification of Hazardous Waste Activity, and submit to the Contracting Officer for review and approval. The Contractor shall allow a minimum of [30] [] days for processing the application and assigning the EPA ID number. Shipment shall be made not earlier than one week after receipt of the EPA ID number.

~~3.56~~ SPECIAL REQUIREMENTS FOR ~~Asbestos~~ WASTES

~~NOTE: If work involves asbestos containing wastes,
designer should determine whether reference to a
separate asbestos specification should be added.~~

~~If work involves asbestos containing wastes, the Contractor shall manage these wastes in accordance with
specification Section []2080.~~

3.6 WASTE MINIMIZATION

The Contractor shall minimize the generation of hazardous waste to the maximum extent practicable. The Contractor shall take all necessary precautions to avoid mixing clean and contaminated wastes. The Contractor shall identify and evaluate recycling and reclamation options as alternatives to land disposal. Requirements of 40 CFR 266 shall apply to: hazardous wastes recycled in a manner constituting disposal; hazardous waste burned for energy recovery; lead-acid battery recycling; and hazardous wastes with economically recoverable precious metals.

3.7 RECORDKEEPING

The Contractor shall be responsible for maintaining adequate records to support information provided to the Contracting Officer regarding exception reports, annual reports, and biennial reports. The Contractor shall be responsible for maintaining asbestos waste shipment records for a minimum of 3 years from the date of shipment or any longer period required by any applicable law or regulation or any other provision of this contract.

3.8 SPILL RESPONSE

The Contractor shall respond to any spill of hazardous materials or hazardous waste which are in the custody or care of the Contractor pursuant to this contract. Any direction from the Contracting Officer concerning a spill or release shall not be considered a change under the contract. The Contractor shall comply with all applicable requirements of Federal, state, or local laws or regulations regarding any spill incident.

3.9 EMERGENCY CONTACTS

The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172, Section .604. Whenever the Contractor ships hazardous materials, the Contractor shall provide a 24-hr emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information.

The phone must be monitored on a 24-hour basis at all times when the hazardous materials are in transportation including during storage incidental to transportation. The Contractor shall ensure that information regarding this emergency contact and phone number are placed on all hazardous materials shipping documents. The Contractor shall designate an emergency coordinator and post the following information at areas in which hazardous wastes are managed:

- a. The name of the emergency coordinator.
- b. Phone number through which the emergency coordinator can be contacted on a 24 hour basis.

- c. The telephone number of the local fire department.
- d. The location of fire extinguishers and spill control materials.

ATTACHMENT 1

SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Attachment 1

SAMPLE OFF-SITE POLICY CERTIFICATION MEMO

Project/Contract #: _____
Waste Stream: _____
Primary TSD Facility, EPA ID # and Location: _____
Alter. TSD Facility, EPA ID # and Location: _____

<u>EPA Region</u>	<u>Primary Contact</u>	<u>Secondary Contact</u>
I	(617) 573-5755	(617) 573-1754
II	(212) 264-9504	(212) 264-2638
III	(215) 597-1857	(215) 597-8338
IV	(404) 347-7603	(404) 347-7603
V	(312) 353-7921	(312) 886-4445
VI	(214) 655-2282	(214) 655-2281
VII	(913) 551-7816	(913) 551-7667
VIII	(303) 293-1823	(303) 293-1506
IX	(415) 744-2129	(415) 744-2114
X	(206) 553-6646	(206) 553-1061

EPA representative contacted: _____
EPA representative phone number: _____
Date contacted: _____

Comment: _____
The above EPA representative was contacted on _____. As of that date the above sites were considered acceptable in accordance with the Off-Site Policy in 40 CFR 300.440.

Signature: _____ Date: _____
Phone number: _____

-- End of Section --

SECTION 02141

DEWATERING LIQUIDS AND HANDLING

PART 1 GENERAL

1.1 LIQUIDS HANDLING REQUIREMENTS

During remediation activities, it is anticipated that the Contractor will encounter the following categories of waste liquids which will require storage, handling and processing.

1. Groundwater seepage into the excavation.
2. Storm water in contact with contaminants of concern.
3. Storm water not in contact with contaminants of concern.
4. Storm water ponded behind CWM discharge point along TNT pipeline section to be removed (approximately Station 28+00).
5. Liquid contained in the TNT pipeline.
6. Liquid used in flushing operations of the TNT pipeline.
7. Liquid contained in the Chemical Waste Sewer pipeline.
8. Liquid used in flushing operations of the Chemical Waste Sewer pipeline.
9. Decontamination liquids.
10. Liquids collected from stockpile area sumps.
11. Liquids removed from the wastewater treatment plant prior to demolition.
12. Liquids removed from pipeline from PCB spill to oil-water separator.

The Contractor is responsible for the proper handling, storage, treatment (if required), and disposal of all liquids encountered or generated during removal activities, including liquids which do not match one of the above anticipated categories.

The Contractor shall provide treatment capability for the handling of waters removed from remediation areas and related to construction activities or shall provide for sampling, analysis, and proper disposal of collected waters at a permitted treatment facility in accordance with applicable regulations. Liquids will be collected in a temporary storage tank until tested and disposed of properly. After sampling and analysis, if liquids (not including decontamination solvents) are determined to be clean and within limits provided in Attachment 1 and applicable water quality standards for discharge, they may, at the direction of the Contracting Officer (CO), be discharged on-site at an appropriate storm drainage area recharge area as instructed in Tables 02141-1 and 02141-2. Waters encountered that are not listed in Tables 02141-1 and 02141-2 will be handled as directed by the Contracting Officer. The effluent limitations and monitoring requirements for discharge into the CWM storm drainage system and additional NY State regulatory limits are included as Attachment 1 to this Section.

If the Contractor provides treatment capability for the handling of liquids removed from remediation areas, the treatment train must be approved by the Contracting Officer.

PART 2 PRODUCTS

The Contractor shall provide all of the materials required for collection, storage, sampling, and ultimate disposal of all liquids encountered during remediation activities. The Contractor is responsible for providing all required materials for on-site treatment of liquids if they choose on-site treatment at their discretion. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

PART 3 EXECUTION

3.1 STORAGE AND SAMPLING REQUIREMENTS

3.1.1 Temporary Storage

The Contractor shall provide temporary storage tanks for the storage of liquids collected during construction activities. These liquids shall be stored in the storage tanks pending sampling, analysis, and disposal. Liquids encountered may include those liquids listed in Part 1.1. The Contractor is responsible for minimizing the quantity of water entering the excavations due to the site runoff and direct precipitation as specified in the erosion and sedimentation controls in Section 01561: ENVIRONMENTAL PROTECTION.

3.1.2 Decontamination Solvents

Waters containing solvents and solvents utilized in the decontamination of on-site equipment and sampling equipment will be handled and containerized separately. The Contractor shall containerize and handle these liquids for offsite transportation and disposal in accordance with Tables 02141-1 and 02141-2 and the requirements of Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.1.3 Containerized Liquids

The Contractor shall containerize non-solvent containing liquids, sample, analyze, and handle the liquids for on-site discharge, on-site treatment and discharge, or off-site treatment/disposal as stated in Tables 02141-1 and 02141-2. The selected option shall be approved by the Contracting Officer. The Contractor shall provide sufficient storage tanks to allow for efficient separation of liquids requiring different treatment/disposal options.

3.1.4 Temporary Storage Tank Approval

The Contractor shall receive approval from the Contracting Officer and property owners for the placement of all temporary storage tank(s) for liquids. The areas used for temporary tank storage shall be bermed to contain the volume of the tank plus 1 foot free board. Two verification samples shall be collected by the Contractor from the subgrade soils below the storage tank(s) before the tanks are installed and after they have been removed from the site. The Contractor shall analyze these samples for total explosives, VOCs, semi-VOCs, and PCBs in accordance with the methods for verification samples presented in Tables 02010-1 and 02010-2.

3.1.5 Liquid Transfer

The Contractor shall supply, with the temporary storage tankage, all pumps and piping required to convey the liquids during processing from removal of liquids to vehicles for off-site disposal. The Contractor shall take precautions necessary to prevent any possible leaks or spills of collected liquids.

The Contractor is responsible for handling, transportation, and disposal of sludges that accumulate at the bottom of the storage tanks; these materials will be handled and disposed of in accordance with Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS. Removal of sediments shall be performed in accordance with the approved Contractor's SSHP.

3.1.6 Sampling and Analysis of Liquids

The Contractor shall provide sampling and analysis of the stored liquids and will provide the Contracting Officer with the analytical data. Based on the results of these samples, the Contractor shall dispose of the liquids according to Parts 3.2 through 3.4, depending on the category of liquids requiring disposal and approval of the disposal option by the Contracting Officer.

3.1.7 Spills

The Contractor is responsible for collecting and containing any spills of such liquid that may occur. In the event of a spill, the Contractor is responsible for the excavation, the cost of transportation, and disposal of any soils affected by the spill. The Contractor shall develop a Contingency Plan for spills.

3.2 DISCHARGE WITHOUT TREATMENT

If the sampling results of the stored liquids are below applicable regulatory limits and below the levels allowable under the CWM storm water discharge permit (included as Attachment 1), specified in Tables 02141-1 and 02141-2, then the Contractor, with the approval of the Contracting Officer and CWM, can discharge the liquids to the designated permitted storm water discharge point as shown on the Drawings. The Contractor will be responsible for coordinating with CWM for all discharge under CWM's permit.

If the sampling results of the stored liquids are above applicable regulatory limits or CWM's discharge permit levels, then the liquids shall be processed according to Parts 3.3 or 3.4, at the option of the Contractor.

3.3 ON-SITE TREATMENT AND DISCHARGE

The Contractor shall have the option to treat the liquids on-site and discharged to the designated storm water locations as specified in Tables 02141-1 and 02141-2. The liquids shall be treated until applicable regulatory and CWM discharge levels are obtained before discharging to the approved permitted storm water discharge point as shown on the Drawings. The Contractor shall sample all liquids after on-site treatment to determine if the liquids can be discharged to the designated storm water discharge point. The Contractor shall receive approval from the Contracting Officer and CWM before discharging liquids to the designated permitted storm water discharge point.

3.4 TREATMENT/DISPOSAL AT PERMITTED FACILITY

If the sampling results of the stored liquids are above applicable regulatory and CWM discharge limits and the Contractor chooses not to treat the water on-site, then the liquids shall be transported and disposed/treated at a permitted facility capable of processing the liquids (as an option under a price comparison/selection process, CWM has wastewater treatment facilities on-site capable of handling the wastewater). The Contractor is responsible to supply all data including any additional characterization analysis, required by the accepting facility for processing the liquids. The Contractor shall containerize and arrange for transport of the liquids to the accepting facility according to Section 02120.

Attachment 1 - Applicable regulatory limits and CWM storm water discharge levels.

-- End of Section --

Table 02141-1

Chemical Waste Sewer Pipeline Liquids Handling

Liquid Type	Disposal Method	Testing Requirements	Discharge Limitations	Comments
Decontamination liquids (water and solvents)	Permitted treatment facility	As required by permitted facility	NA	Permitted treatment facility refers to treatment/disposal at permitted treatment/disposal facility selected by Contractor based on proce evaluation of major permitted facilities in the area.
Non-contact storm water (not in contact with contaminated soil/materials)	Establish storm water diversions to direct to on-site storm water channels	No testing required if storm water is diverted	Listed in regulatory limitations (see Attachment 1)	No testing required of storm water that is diverted away from remediation activities and is not in contact with potentially or known contaminated materials.
Contact storm water (in contact with contaminated soil/materials)	Option A: Permitted treatment facility	As required by permitted facility	NA	This is the preferred option; treatment/disposal at permitted treatment/disposal facility.
	Option B: On-site at approved, permitted CWM storm water discharge point (see Drawings-located south of LF-12)	Listed in regulatory monitoring requirements (see Attachment 1). Waters shall be first contained/stored and then tested to determine disposal option.	Listed in regulatory limitations (see Attachment 1)	Due to presence of contaminants, water will likely not meet regulatory limitations. If water does not meet regulatory limitations, then Contractor must dispose of at permitted facility; or treat water on-site, retest for monitoring requirements, and meet effluent limitations.

02141-5

Table 02141-1

Chemical Waste Sewer Pipeline Liquids Handling (Continued)

Liquid Type	Disposal Method	Testing Requirements	Discharge Limitations	Comments
Liquid contained in Chemical Waste Sewer Pipeline	Permitted treatment facility	As required by permitted facility	NA	Permitted treatment facility refers to treatment/disposal at permitted treatment/disposal facility selected by Contractor based on prices provided by major treatment facilities in the area.
Liquid used in flushing operations of Chemical Waste Sewer Pipeline	Option A: Permitted treatment facility	As required by permitted facility	NA	This is the preferred option; treatment/disposal at permitted treatment/disposal facility.
	Option B: On-site at approved permitted CWM storm water discharge point (see Drawings-located south of LF-12)	Listed in regulatory monitoring requirements (see Attachment 1). Waters shall be first contained/stored and then tested to determine disposal option.	Listed in regulatory limitations (see Attachment 1)	Due to presence of contaminants, water will likely not meet regulatory limitations. If water does not meet regulatory limitations, then Contractor must dispose of at permitted facility; or treat water on-site, retest for monitoring requirements, and meet effluent limitations.

NA = Not applicable

Table 02141-2

TNT Pipeline Liquids Handling

Liquid Type	Disposal Method	Testing Requirements	Discharge Limitations	Comments
Decontamination liquids (water and solvents)	Permitted treatment facility	As required by permitted facility	NA	Permitted treatment facility selected by Contractor based on prices provided by permitted facilities in the area.
Non-contact storm water (not in contact with contaminated soil/materials)	Establish storm water diversions to direct to on-site storm water channels	No testing required if storm water is diverted	Listed in regulatory limitations (see Attachment 1)	No testing required of storm water that is diverted away from remediation activities and is not in contact with potentially or known contaminated materials.
Contact storm water (in contact with contaminated soil/materials) and ponded water along TNT pipeline sections to be removed (approx. Station 28+00)	Option A: Permitted treatment facility	As required by permitted facility	NA	This is the preferred option; treatment/disposal at permitted treatment/disposal facility.
	Option B: On-site at approved permitted CWM storm water discharge point (see Drawings-approx. Station 28+00)	Listed in regulatory monitoring requirements (see Attachment 1). Waters shall be first contained/stored and then tested to determine disposal option.	Listed in regulatory limitations (see Attachment 1)	Due to presence of contaminants, water will likely not meet regulatory limitations. If water does not meet regulatory limitations, then Contractor must dispose of at permitted facility; or treat water on-site, retest for monitoring requirements, and meet effluent limitations.

02141-7

Table 02141-2

TNT Pipeline Liquids Handling (Continued)

Liquid Type	Disposal Method	Testing Requirements	Discharge Limitations	Comments
<ul style="list-style-type: none"> Liquid contained in TNT pipeline and decant waters from sediment recovery/storage Liquids contained in pipeline from PCB spill (Station 15+80) to oil/water separator. 	Permitted treatment facility	As required by permitted facility	NA	Permitted treatment facility selected by Contractor based on prices provided by permitted facilities in the area.
<ul style="list-style-type: none"> Liquid used in flushing operations of TNT Pipeline Liquids removed from wastewater treatment plant prior to demolition. 	Option A: Permitted treatment facility	As required by permitted facility	NA	This is the preferred option; treatment/disposal at permitted treatment/disposal facility.
	Option B: On-site at approved, permitted CWM storm water discharge point (see Drawings-located at approx. Station 28+00)	Listed in regulatory monitoring requirements (see Attachment 1). Waters shall be first contained/stored and then tested to determine disposal option.	Listed in regulatory limitations (see Attachment 1)	Due to presence of contaminants, water will likely not meet regulatory limitations. If water does not meet regulatory limitations, then Contractor must dispose of at permitted facility; or treat water on-site, retest for monitoring requirements, and meet effluent limitations.

02141-8

Table 02141-2

TNT Pipeline Liquids Handling (Continued)

Liquid Type	Disposal Method	Testing Requirements	Discharge Limitations	Comments
Groundwater seepage into excavation	Option A: Permitted treatment facility	As required by permitted facility	NA	Based on existing groundwater quality data, contaminants will be present in groundwater; therefore, disposal at a permitted facility is the preferred option.
	Option B: On-site at approved, permitted CWM storm water discharge point (see Drawings-located at approx. Station 28+00)	Listed in regulatory monitoring requirements (see Attachment 1). Waters shall be first contained/ stored and then tested to determine disposal option.	Listed in regulatory limitations (see Attachment 1)	Due to presence of contaminants, water will likely not meet regulatory limitations. If water does not meet regulatory limitations, then Contractor must dispose of at permitted facility; or treat water on-site, retest for monitoring requirements, and meet effluent limitations
Liquids collected from sumps of potentially contaminated soil/pipeline materials stockpile/decon areas	Permitted treatment facility	As required by permitted facility	NA	Permitted treatment facility selected by Contractor based on prices provided by permitted facilities in the area.

NA = Not applicable

ATTACHMENT 1

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

ATTACHMENT 1A

CWM STORMWATER

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Contractor must comply with daily max or daily average as specified below:

Outfall Number & Effluent Parameter	Discharge Limitations		Units	Minimum Monitoring Requirements	
	Daily Avg.	Daily Max.		Measurement Frequency	Sample Type
003 - Storm Water					
Flow	Monitor	Monitor	MGD	Daily	Meter
pH (Range)	6.5 - 8.5		SU	Weekly	Grab
Specific Conductance	Monitor	Monitor	Umho/cm	Weekly	Grab
Solids, Suspended	Monitor	Monitor	mg/l	Monthly	Grab
Solids, Dissolved	Monitor	Monitor	mg/l	Monthly	Grab
BOD ₅	Monitor	Monitor	mg/l	Monthly	Grab
Dissolved Oxygen	Monitor	Monitor (min)	mg/l	Monthly	Grab
Ammonia (as N)	1.5	Monitor	mg/l	Monthly	Grab
Oil & Grease	Monitor	15	mg/l	Monthly	Grab
Copper, Total	Monitor	60	µg/l	Monthly	Grab
Zinc, Total	Monitor	135	µg/l	Monthly	Grab
Aroclor 1016	Monitor	650	µg/l	Monthly	Grab
Aroclor 1221	Monitor	650	µg/l	Monthly	Grab
Aroclor 1232	Monitor	650	µg/l	Monthly	Grab
Aroclor 1242	Monitor	650	µg/l	Monthly	Grab
Aroclor 1248	Monitor	650	µg/l	Monthly	Grab
Aroclor 1264	Monitor	650	µg/l	Monthly	Grab
Aroclor 1280	Monitor	650	µg/l	Monthly	Grab
Phenols, Total	10	Monitor	µg/l	Monthly	Grab
2-Chloroethyl vinyl ether	Monitor	20	µg/l	Monthly	Grab
Dichlorodifluoromethane	Monitor	10	µg/l	Monthly	Grab
Methylene Chloride	Monitor	20	µg/l	Monthly	Grab
Total Volatile Organics	Monitor	10	µg/l	Monthly	Grab

ATTACHMENT 1 B

REGULATORY LIMITS FOR CONSTITUENTS NOT MONITORED BY CWM EFFLUENT/MONITORING REQUIREMENTS

Area/Constituent	NYSDEC Regulatory Limit (µg/L)
TNT Pipeline - After location 15+80	
Hexachlorobenzene	0.35
Butyl benzylphthalate	50
bis(2-ethyl-hexyl)phthalate	0.6
Di-n-butyl phthalate	50
Acenaphthene	20
Anthracene	50
Benzo(a)anthracene	0.002
Benzo(b)fluoranthene	0.002
Benzo(k)fluoranthene	0.002
Benzo(a)pyrene	ND
Chrysene	0.002
Fluoranthene	50
Naphthalene	10
Phenanthrene	50
Pyrene	50

ND = Not detected/default to standard detection limit.

µg/l = micrograms per liter.

NYSDEC = New York State Department of Environmental Conservation Ambient Water Quality Standards on Guidance Values, October 1993.

SECTION 02142

REMEDIATION OF CHEMICAL WASTE SEWERS AND LIFT STATIONS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 General

The work to be completed under this section includes the removal of liquids and solids (sludges) from six (6) Chemical Waste Sewer Lift Stations and associated sewer lines, cleaning of the lift stations and sewer lines by pressure washing, sealing of the cleaned lift stations, and proper management and disposal of all wastes generated during these activities. The Contractor shall finish all labor, materials, equipment and services necessary to complete the work required in the specifications and as shown on the drawings.

All operations shall be conducted in accordance with the Contractor's site-specific health and safety plan. Results of previous site investigations on the Chemical Waste Sewer are provided as Attachment 1 of this section.

1.2 SUBMITTALS

1.2.1 Lift Station and Pipeline Flushing and Sediment/Liquids Handling Plan - Chemical Waste Sewers

Thirty calendar days following the Notice to Proceed and prior to the Preconstruction Plan Review Conference, the Contractor shall submit for the Contracting Officer's review a Preliminary Lift Station and Pipeline Flushing and Sediment/Liquids Handling Plan as part of the Site Operations Plan for the work in this Section to be accomplished. The Plan shall include the proposed sequence of operations; method for accessing and opening the sumps and sewer; the type, rated capacity, and quantity of equipment to be used in the pipeline flushing operation; plans showing locations and configuration of proposed temporary stockpiles and equipment decontamination areas; method to main access roads leading out of the exclusion zone clean; maintaining clean vehicles during loading operations and exiting from site; the drainage and dewatering methods to control and remove surface water and groundwater flowing toward and tending to collect in excavations; methods for removing, handling, and dewatering sediments; and methods for collecting, treating, and recycling flush waters. If on-site stabilization of sediments is used, the Plan shall include the stabilization operation, including stabilization reagents, additives and recipe, stabilization mixing method and equipment, environmental controls, utility requirements, and performance testing. The Contractor shall incorporate all comments received from the Contracting Officer at the Preconstruction Plan Review Conference and submit a Final Pipeline Flushing Plan within 30 days after the conference. Pipeline flushing shall be performed in accordance with the approved Plan and, if the required results are not obtained, the Contractor shall revise his plans in writing before changing the work procedures.

PART 2 PRODUCTS

2.1 LIQUID STAGING AREAS

2.1.1 Impermeable Barrier

The impermeable barrier shall consist of a 40-mil high density polyethylene geomembrane.

PART 3 EXECUTION

3.1 SEWER AND LIFT STATION DECONTAMINATION

3.1.1 Equipment and Personnel

The Contractor shall provide all labor, materials, equipment and services for the following activities.

3.1.1.1 Accessing Lift Stations

The Contractor shall locate and access the Chemical Waste Sewer lift stations. The lift station shall be opened by removing the existing steel cover. The location of the lift stations shall be surveyed to provide a permanent record of their locations.

The Contractor is responsible for providing a survey of the existing surface elevations (topographical survey of area); performing any intermediate surveying as needed; performing final survey of excavated depths and dimensions if sumps are used to access the pipeline; and providing a final grade survey of backfilled areas.

The Contractor shall coordinate all survey work with the CO prior to and during work activities at the site. All coordinate and elevation data shall be determined to the nearest 0.01 ft. Horizontal measurements shall be tied into the CWM facility coordinate system. All elevations will be referenced to the National Geodetic Vertical Datum of 1929.

3.1.1.2 Liquid Removal

Removal of accumulated liquids from each of the Chemical Waste Sewer Lift Stations and associated sewer system piping as shown on the Drawings. The sewer line sizes are based on existing drawings and shall be confirmed by the Contractor prior to commencement of work activities. Liquid shall not be completely removed from lift stations, in order to minimize disturbance and removal of contaminated bottom sludge. Liquids shall be transferred to temporary storage vessels pending characterization analysis and disposal.

3.1.1.3 Sampling and Analysis

Sampling and analysis of stored liquids to determine proper treatment/disposal requirements.

3.1.1.4 Disposal of Stored Liquids

Decanting of collected liquids and segregation from solids settled out from these liquids. All waste transport shall be by licensed waste haulers. Disposal shall be at permitted treatment/disposal facilities. Transportation and disposal requirements are provided in Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.1.1.5 Investigation of Previously Unidentified Chemical Sewer Pipeline Tie-Ins and Determination of Their Integrity

Tie-ins may be revealed following removal of accumulated liquids. Each tie-in shall be investigated to determine its integrity prior to removal of sludges, using a pipeline (downhole) camera or other approved methods. Any openings in the pipeline identified during this investigation shall be documented, including its approximate location relative to the tie-in point in the lift station. If tie-ins are identified, the Contractor shall excavate at the suspected point of the tie-in until it is encountered. The Contractor shall survey and photograph the tie-in, and this information shall be provided to the CO. The tie-in shall be accessed and grouted to allow flushing of the Chemical Waste Sewers to continue. The Contractor shall then backfill and restore the area.

3.1.1.6 Removal of Sludges (Sediments from the Chemical Waste Sewer Lift Stations)

Removal shall be by vacuum or other approved method and shall include all liquid and solid phase materials in the lift station. Removed materials shall be containerized pending characterization analysis and disposal.

The Contractor shall use best engineering practices to remove sediment from the lift stations. In order to document the post remediation conditions, wipe samples will be collected from the inside wall using a remote collection method. Samples will be collected at a rate of one sample per accessible location, which will be each end to be plugged at the lift stations. The samples will be analyzed at an off-site/fixed based laboratory for TCL semivolatiles and PCBs. The samples will be collected by wiping a 10 cm x 10 cm area of the inside of the sewer/lift station using a remote sampler. The wipe sample will be collected using a dedicated clean gauze pad that has been pre-moistened with methanol and a clean stainless steel or aluminum template. A clean pair of phthalate-free gloves will be used to collect each sample. Sampling and analysis shall be as specified in Section 02010: CONFIRMATION, VERIFICATION, AND POST-INTERIM REMOVAL ACTION SAMPLING.

3.1.1.7 Sampling and Analysis

Sampling and analysis, as necessary to determine appropriate disposal of sludges/sediments and liquids.

3.1.1.8 Disposal of Containerized Sludges/Sediments

All waste transport shall be by licensed waste haulers. Disposal shall be at permitted treatment/disposal facilities. Transportation and disposal of sludges/sediment shall be performed in accordance with Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.1.1.9 Stabilization of Sludges/Sediments As Required To Meet Acceptance Criteria of the Disposal Facility(ies)

Stabilization of sludges/sediments shall be in accordance with the requirements of the accepting facility. Stabilization may be performed on-site by the Contractor or at the accepting permitted facility. If on-site stabilization is used, the Contractor shall define the method, including but not limited to, reagents, equipment, environmental controls, and compliance testing, in his work plan. The Contractor is responsible for procuring all materials and support (reagents, water, utilities, equipment) for the on-site stabilization. The Contractor is responsible for ensuring that stabilized materials are accepted for off-site disposal, and reprocessing, if necessary, to gain acceptance, and shall be at the Contractor's expense. The Contractor's SSHP shall define health and safety precautions to be followed during any on-site stabilization activities.

3.1.1.10 Power Washing the Chemical Waste Sewer System, Including the Pipelines and Pump Station, Using a High Pressure Water Washing System

The Contractor shall determine the most effective means to access the main trunk line of the Chemical Waste Sewer in order to effectively remove the sediments and liquids contained within the sewer line through power washing. Based upon the available information, the lift stations are off-set from the main trunk line, joining the trunk line at a 90° angle. It may be difficult to effectively power wash the line from this access point if the power wash equipment cannot make a 90° turn. If the Contractor is unable to use the lift station as an access point, he shall access the main trunk line by removing the overlying soils, installing a lined sump for collection of wash waters, and opening the line at the sump location. The main trunk line is reported to be constructed of stainless steel. The method(s) of accessing the pipeline, constructing temporary sumps and flushing the line shall be as specified in Section 02228: FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE.

The lift stations (typically 10 ft x 10 ft x 10.5 ft) shall be used as access and sump locations for the wash waters. The pipeline power wash system shall be capable of cleaning the inner surfaces of the pipeline without causing damage to the pipe. The power wash system shall be inserted and extended into the pipe until the next chemical sewer lift station on the line is encountered or to the limits of the equipment. The power wash system shall be used to flush the sludges from the line and into the lift stations. Following flushing and verification, each pipeline segment shall be sealed to prevent the backwash of the next pipeline section from entering into the washed section.

3.1.1.11 Verification

Upon completion of the power washing, the Contractor shall verify that the sediments have been removed by pipeline video camera techniques. If sediment is observed, the Contractor shall power wash the segment of the pipeline again. This procedure shall be followed until it can be visually verified that the sediment has been removed.

3.1.1.12 Sealing of Chemical Waste Sewer at Somerset Property Line and Sealing of Lift Stations

The Chemical Waste Sewer shall be exposed at the Somerset Property Line, and a section of the pipeline removed to allow for the placement of a minimum 3 ft concrete grout plug on each side of the exposed sewer. After the grout plug is set, the exposed pipeline shall be backfilled and the area restored to prior conditions in accordance with Section 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS.

Upon complete removal of the sediments and liquids from the pipeline and lift station, the lift stations shall be sealed by spot welding the cover to the lift station outer wall.

3.1.1.13 Containment, Collection and Proper Disposal of All Washwater, Sediment, Debris, and Other Materials Flushed from the System

Sediments and debris from the pipeline may be combined with sludge/sediments removed from the lift station for disposal. Washwater may be combined with accumulated liquid removed from the lift station for disposal. Transportation and disposal shall be in accordance with Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS MATERIALS.

3.1.1.14 Liquids, Sediments, and Flushing/Washwaters Disposal

All liquids and sediments removed from the Chemical Waste Sewer System, including the flushing/wash waters, shall be directly pumped from the lift stations to a tank truck or tank on a flat bed truck for transport to the designated lined liquids storage area. The liquids storage area shall provide for secondary containment of the stored liquids and shall be constructed with the same liner and sump requirements as the contaminated soil stockpile areas shown on the drawings. The Contractor shall remediate any spills during his remediation activities immediately at no cost to the Government.

3.1.1.15 Health and Safety

The Contractor will be responsible for developing an approved Site Safety and Health Plan (SSHP) and a Contingency Plan for release of material prior to commencing removal of material from the chemical waste sewer system. The HASP shall include requirements and procedures for potentially entering the lift stations that are confined spaces and may require Level B personal protective equipment.

-- End of Section --

ATTACHMENT 1

CHEMICAL WASTE LIFT STATION RESULTS

Table 2-21
Analytical Results—Chemical Waste Lift Stations
CWM, 1989

Compound	Chemical Waste Lift Stations					
	Area 7		Area 8		Oil/Water Separator	
	Sludge (CWLS7-1)	Sewage (CWLS7-2)	Sludge (CWLS8-1)	Sewage (CWLS8-2)	Sludge (CWLS7A-1)	Sewage (CWLS7A-2)
Volatiles	(µg/kg)	(µg/L)	(µg/kg)	(µg/L)	(µg/kg)	(µg/L)
Benzene	-	-	-	-	54	-
Carbon tetrachloride	-	-	160,000,000	> 190	-	-
Chlorobenzene	-	-	-	-	60	-
Chloroform	-	-	2,900,000	> 110	-	-
1,1-Dichloroethene	-	-	-	> 24	-	-
Ethylbenzene	-	-	-	-	1,700	-
Methylene chloride	2.1	-	< 7,000	< 14	< 28	-
Tetrachloroethene	-	-	1,100,000	> 21	90	-
Toluene	-	-	490,000	< 30	< 60	-
1,1,1-Trichloroethane	-	-	-	> 250	-	-
Trichloroethene	-	-	50,000	> 9.5	< 19	> 1.9
Vinyl chloride	-	-	-	-	560	> 5.0
Xylenes	11	-	1,100,000	-	2,800	-
TOTAL	13.1	—	165,647,000	648.5	5,371	6.9
Semivolatiles						
Anthracene	-	-	-	-	8,700	-
Chrysene	-	-	-	-	13,000	-
Fluoranthene	-	-	-	-	12,000	-
Hexachlorobenzene	-	-	69,000	-	-	-
Hexachlorobutadiene	5,900	-	-	-	-	-
Hexachloroethane	-	-	28,000	-	-	-
Phenanthrene	-	-	24,000	-	70,000	-
Pyrene	-	-	-	-	60,000	-
Bis(2-ethylhexyl)phthalate	> 600	-	-	-	-	-
TOTAL	6,500	—	121,000	—	163,700	—
Pesticide/PCBs						
PCB 1248	-	-	710,000	-	-	-
PCB 1260	> 0.066	-	150,000	-	-	-
TOTAL	0.066	—	860,000	—	—	—
Metals	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
Antimony	-	-	-	-	3.0	-
Arsenic	8.3	-	0.22	-	12	-
Beryllium	0.25	-	-	-	0.43	-
Boron	-	-	780	-	-	-
Cadmium	-	-	-	-	25	-
Chromium	3.4	-	8.4	-	71	-
Copper	1,500	< 0.02	< 1.5	-	360	-
Lead	12	< 0.002	9.3	-	220	< 0.002
Lithium	2.6	-	-	-	8.3	-
Mercury	0.05	-	-	-	-	-
Nickel	10	-	15	0.02	39	-
Selenium	50	-	-	-	64	-
Silver	2.9	-	-	-	3.7	-
Zinc	29	-	12	0.33	850	-

Table 2-22

**Analytical Results—Area 31
Chemical Waste Lift Station
Acres, 1992**

Parameter	SEW-31-2	SLDG-31-1
Volatiles	(µg/L)	(µg/kg)
Tetrachloroethene	-	28J
Trichloroethene	2.6J	320J
Trans 1,2-Dichloroethene	5.1	-
Vinyl chloride	<u>3.7J</u>	-
Total Volatiles	11.4	348
Volatile TICs	214	1,418,720
Semivolatile		
Benzoic Acid	-	90JB/-
Bis(2-ethylhexyl)phthalate	-	3900/-
Hexachlorobutadiene	4400	100,000BEJ/ 242,000BJ
Acenaphthene	-	6.0J/-
Anthracene	-	42J/-
Benzo(a)anthracene	-	71J/-
Benzo(b)fluoranthene	-	58J/-
Benzo(k)fluoranthene	-	24J/-
Benzo(a)pyrene	-	36J/-
Phenol	-	16J/-
Pyrene	-	200J/-
p-Chloro-m-cresol	-	22J/-
Chrysene	-	87J/-
Fluoranthene	-	290J/-
Hexachlorobenzene	-	<u>130J/-</u>
Total Semivolatiles	4,400	246,972
Semivolatile TICs	119	4,390
Pesticides/PCBs		
delta-BHC	-	35J
Heptachlor	-	55J
Aroclor 1254	-	1300J

Table 2-22

Analytical Results—Area 31
Chemical Waste Lift Station
Acres, 1992
(Continued)

Parameter	SEW-31-2	SLDG-31-1
<u>Metals</u>	(mg/L)	(mg/kg)
Arsenic	0.005U	3.5J
Barium	0.036	19
Boron	0.5U	50U
Cadmium	0.005U	0.59
Chromium	0.01U	18
Copper	0.01U	17
Iron	0.16	NR
Lead	0.003U	66
Manganese	0.38	NR
Mercury	0.0004U	0.22
Nickel	0.02U	14
Selenium	0.005UR	0.5UJ
Silver	0.01UJ	0.6UJ
Sodium	7.5	NR
Zinc	0.013J	53BR
Lithium	0.076	8.2

- B - Indicates compound detected in blank.
 E - Indicates compound concentration exceeds calibration range of analytical instrument.
 J - Indicates an estimated concentration of the detected compound or an estimated concentration of the compound below the CRQL or CRDL.
 NR - Indicates analyses not run or required.
 U - Indicates compound not detected at given detection limit.

Table 2-23
Analytical Results—Area 4
Chemical Waste Lift Station
Acres, 1992

Parameter	SEW-4-2	/SEW-DUP-1	SLDG-4-1
Volatiles	(µg/L)	(µg/L)	(µg/kg)
Acetone	-	-	230
Ethylbenzene	-	-	150
Toluene	-	-	82
Xylene (total)	-	-	1600
Total Volatiles	-	-	2,062
Volatile TICs	-	-	11,440
Semivolatiles			
Acenaphthene	-	-	1200J
Anthracene	-	-	1800
Benzo(a)anthracene	-	-	1300
Bis(2-ethylhexyl) phthalate	-	-	18000
Chrysene	-	-	1600
Dibenzofuran	-	-	1700
Fluoranthene	-	-	6400
Fluorene	-	-	2300
2-Methylnaphthalene	-	-	12000
Naphthalene	-	-	5100
Acenaphthylene	-	-	170J
N-nitrosodiphenylamine	-	-	810J
Phenanthrene	-	-	19000
Pyrene	-	-	6100
Total Semivolatiles	-	-	77,480
Semivolatile TICs	6	99	131,600
Metals	(mg/L)	(mg/L)	(mg/kg)
Arsenic	0.005U	0.005U	6.8J
Barium	0.045	0.046	124
Boron	0.13J	0.089J	61
Cadmium	0.005U	0.005U	50
Chromium	0.01U	0.018	255
Copper	0.026J	0.048J	92
Iron	0.23	0.65	NR
Lead	0.003U	0.008	10
Manganese	0.12	0.12	NR
Mercury	0.0006U	0.0006U	1020
Nickel	0.02U	0.02U	1.2J
Selenium	0.005UR	0.005UR	42J
Silver	0.01U	0.01U	0.96UR
Sodium	9.9	10	NR
Zinc	0.02J	0.056J	2.0UR
Lithium	0.13J	0.13J	1070
Pesticides/PCBs			
Aroclor 1242	-	-	37000J

- B - Indicates compound detected in blank.
 E - Indicates compound concentration exceeds calibration range of analytical instrument.
 J - Indicates an estimated concentration of the detected compound or an estimated concentration of the compound below the CRQL or CRDL.
 NR - Indicates analyses not run or required.
 U - Indicates compound not detected at given detection limit.

Table 2-24

**Analytical Results—Area 22
Chemical Waste Lift Station
Acres, 1992**

Parameter	SEW-22-1	/SEW-DUP-5	SLDG-22-1
Volatiles	(µg/L)	(µg/L)	(µg/kg)
Chloroform	4.0J	NR	-
1,1-Dichloroethane	1.0J	NR	-
Trans-1,2-Dichloroethene	3.0J	NR	-
Ethylbenzene	-	NR	7,440,000
Tetrachloroethene	0.9J	NR	1,400,000
1,1,2-Trichloroethane	3.0J	NR	180,000
1,1,2,2-Tetrachloroethane	0.8J	NR	890,000
Toluene	-	NR	15,000,000
Trichloroethene	4.0J	NR	300,000
1,1,1-Trichloroethane	-	NR	1,100,000
Xylene (total)	-	NR	40,000,000
Total Volatiles	16.7	-	66,310,000
Volatile TICs	ND	-	10,600,000
Semivolatiles			
Naphthalene	-	-	72,000J
Butylbenzyl phthalate	-	-	120,000J
Hexachlorobenzene	-	-	480,000J
Hexachlorocyclopentadiene	-	-	1,400,000J
Hexachloroethane	-	-	2,300,000J
Total Semivolatiles	-	-	43,720,000
Semivolatile TICs	91	-	76,140
Pesticides/PCBs			
Methoxychlor	-	NR	3400J
Dieldrin	-	NR	2,700J
Endrin	-	NR	15,000J
Endrin Ketone	-	NR	3,400J
Total Pesticides/PCBs			24,500

Table 2-24
Analytical Results—Area 22
Chemical Waste Lift Station
Acres, 1992
(Continued)

Parameter	SEW-22-1	/SEW-DUP-5	SLDG-22-1
Metals	(mg/L)	(mg/L)	(mg/kg)
Arsenic	0.005U	NR	0.62J
Barium	0.03U	NR	1625
Boron	0.27J	NR	8.9
Cadmium	0.005U	NR	5.7
Chromium	0.01U	NR	629
Copper	0.01UJ	NR	181
Iron	0.18	NR	NR
Lead	0.003U	NR	785
Manganese	0.046	NR	NR
Mercury	0.0006U	NR	0.14
Nickel	0.02U	NR	37J
Selenium	0.005UR	NR	0.52UR
Silver	0.01U	NR	0.99UR
Sodium	722	NR	NR
Zinc	0.01UJ	NR	32J
Lithium	0.012J	NR	2.4
Cyanide	0.01U	NR	NR

- B - Indicates compound detected in blank.
E - Indicates compound concentration exceeds calibration range of analytical instrument.
J - Indicates an estimated concentration of the detected compound or an estimated concentration of the compound below the CRQL or CRDL.
R - Indicates a rejected compound concentration.
NR - Indicates analyses not run or required.
U - Indicates compound not detected at given detection limit.

Table 2-25
Analytical Results
Miscellaneous Liquids and Oils
Acres, 1992

Parameters	UO-1	UO-2	Area 6	
			UO-3	UO-DUP
<u>Volatiles</u>	(µg/L)	(µg/L)	(µ/kg)	(µg/kg)
Acetone	30	56	-	-
Toluene	-	-	-	240J
Total Volatiles	30	56	-	240
Volatile TICs	-	-	1,000	16,080
<u>Semivolatiles</u>	-	-	-	-
Acenaphthene	-	-	20,000J	18,000J/17,000J
Anthracene	-	-	97,000J	93,000J/59,000J
Dibenzofuran	-	-	37,000J	32,000J/34,000J
Fluorene	-	-	73,000J	65,000J/64,000J
2-Methylnaphthalene	-	-	350,000	310,000J/320,000J
Phenanthrene	-	-	1,300,000J	1,300,000J/1,200,000J
Total Semivolatiles	-	-	1,914,000	1,694,000
Semivolatiles TICs	30	-	20,440,000	12,160,000
<u>Metals</u>	(mg/L)	(mg/L)	(mg/kg)	(mg/kg)
Arsenic	0.025UJ	0.025UJ	0.25UJ	0.25UJ
Barium	0.03UJ	0.03UJ	10UR	10UR
Boron	0.5UJ	0.5UJ	9.8J	18J
Cadmium	0.005UJ	0.005UJ	0.67	0.74
Chromium	224,000	227,000	2.1	1.8
Copper	0.01UJ	0.01UJ	4.3J	5.0J
Iron	1100J	800	7.4J	5.4J
Lead	0.062	0.062	3.0UR	3.5RB
Manganese	0.1	1.3	0.5U	0.5U

Table 2-25
Analytical Results
Miscellaneous Liquids and Oils
Acres, 1992
(Continued)

Parameters	UO-1	UO-2	Area 6	
			UO-3	UO-DUP
Mercury	0.0037	0.0037U	0.093U	0.092U
Nickel	0.02UJ	0.02UJ	11	8.4
Selenium	0.005UR	0.005UR	0.25UR	0.25UR
Silver	1.8J	1.8J	5.4J	5.7J
Sodium	331	376	200U	198U
Zinc	0.68J	4.9J	8.2	7.8
Lithium	0.35	0.28	0.25U	0.35

- B - Indicates compound detected in blank.
- E - Indicates compound concentration exceeds calibration range of analytical instrument.
- J - Indicates an estimated concentration of the detected compound or an estimated concentration of the compound below the CRQL or CRDL.
- R - Indicates a rejected compound concentration.
- NR - Indicates analyses not run or required.
- U - Indicates compound not detected at given detection limit.

Table 2-26

**Analytical Results—Asbestos
Somerset Group Property
Acres, 1992**

Sample #	Location	Sample Type	Asbestos Percentage				
			Amosite	Chrysotile	Crocidolite	Others	Total Percentage
ASB-06-01	Area 6 - Building #6-01	Pipe insulation	10%	5%	ND	ND	15%
ASB-06-02	Area 6 - Building #6-01	Bagged material	ND	ND	ND	ND	0
ASB-06-03	Area 6 - Building #6-01	Bagged material	ND	8%	ND	ND	8%
ASB-06-04	Area 6 - Building #6-01	Bagged material	ND	ND	ND	ND	0
ASB-06-05	Area 6 - Building #6-01	Bagged material	ND	ND	ND	ND	0
ASB-06-06	Area 6 - Building #6-01	Hopper insulation	12%	3%	ND	ND	15%
ASB-062-01	Area 6 - Building #6-02 Building #14-01	Pipe insulation	12%	8%	ND	ND	20%
ASB-30A-01	Area 30A - Combustibles Warehouse	Pipe insulation	ND	ND	ND	ND	0
ASB-30A-02	Area 30A - Combustibles Warehouse	Bagged material	ND	40%	ND	ND	40%

Table 2-26

**Analytical Results—Asbestos
Somerset Group Property
Acres, 1992
(Continued)**

Sample #	Location	Sample Type	Asbestos Percentage				
			Amosite	Chrysotile	Crocidolite	Others	Total Percentage
ASB-41-01	Area 41 - Maintenance Shop	Pipe insulation	ND	ND	ND	ND	0
ASB-31-01	Area 31 - Laboratory	Pipe insulation	ND	30%	ND	ND	30%
ASB-27-01	Area 27 - Guard House	Corrugated panel	ND	10%	ND	ND	10%
ASB-DUP-01	Area 27 - Guard House	Corrugated panel	ND	10%	ND	ND	10%

ND - Indicates Not Detected

Table 2-27

**Materials Identified
for Removal Actions in
Operable Units No. 1 and 2**

Area	Media	Weight	Volume	Contaminant	Approximate Concentration	Comments
TNT Sewers						
	Residue	255 tons	150 yd ³	Vol.	11 ppm	For alternatives evaluation and cost estimating, assume 10% crystalline solids and 90% sediment. Assume entire mass is potentially explosive (TNT > 10%).
				S-Vol.	1 ppm	
				TNT	25,000ppm	
	Soil	85 tons	50 yd ³	Assume same as for residues		For alternatives evaluation and cost estimating, assume 10% tests as hazardous and 90% nonhazardous. Assume all nonexplosive.
	Concrete/Pipe	4,500 tons	2,222 yd ³	Assume same as for residues		
	Water		45,000 gal.	Vol.	86 ppm	For cost estimating, assume water from within sewer system only.
				S-Vol.	206 ppm	
				TNT	10 ppm	
Area A						
	Soil/Drums	6,800 tons	4,000 yd ³	Vol.	8 ppm	For alternatives evaluation and cost estimating, assume 50% of mass tests as hazardous and 50% nonhazardous.
				S-Vol.	3 ppm	
				Pesticides	0.05 ppm	
	Water		200,000 gal.	Vol.	3 ppm	For cost estimating, assume free groundwater from immediate excavation only.
				S-Vol.	0.5 ppm	
Area B						
	Sediment/Soils	20,400 tons	12,000 yd ³	Vol.	22 ppm	For alternatives evaluation and cost estimating, assume 50% of mass tests as hazardous and 50% nonhazardous.
				S-Vol.	45 ppm	
				Pesticides	3 ppm	

Table 2-27

**Materials Identified
for Removal Actions in
Operable Units No. 1 and 2
(Continued)**

Area	Media	Weight	Volume	Contaminant	Approximate Concentration	Comments
	Water		120,000gal.	Assume same as for sediment and soils		For cost estimating, assume free groundwater from excavation of former surface depression only.
AFP-68						
	Sludge	42.5 tons	25 yd ³	Vol.	165,640ppm	For alternatives evaluation and cost estimating, assume all sludge tests as hazardous.
				S-Vol.	43,720ppm	
				Pest/PCBs	860 ppm	
				Ba	1,625 ppm	
				Cu	1,500 ppm	
				Cd	50 ppm	
				Cr	255 ppm	
				Hg	1,020 ppm	
				Pb	785 ppm	
	Sewage		30,000gal.	Vol.	1 ppm	
				S-Vol.	4.4 ppm	
	Drum of Oil		55 gal.	Vol.	16 ppm	
				S-Vol.	20,440 ppm	
	Chronic Acid		26 gal.	Cr	227,000ppm	
				pH	0.3 - 1.0	
	Misc. Liquids/ Oils		16 gal.	pH varies	1 - 12	

Table 2-27
Materials Identified
for Removal Actions in
Operable Units No. 1 and 2
(Continued)

Area	Media	Weight	Volume	Contaminant	Approximate Concentration	Comments
Asbestos						
	Panels	1,120 tons		Asbestos		
	Pipe Insulation	20 tons		Asbestos		
	Bagged Mortar	2 tons		Asbestos		
	Hopper	2		Asbestos		

Quantity estimates based on 1.7 tons per yd³ for soil, sediment, and residues; 2 tons per yd³ for concrete pipelines and asbestos panels; and 1 ton per cubic yard for asbestos pipe insulation.

Total: Soils/sludge/drums - 27,582.5tons
Concrete - 4,500tons
Water/sewage - 395,000gallons

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

SECTION 02143

DECONTAMINATION OF CONSTRUCTION EQUIPMENT

PART 1 GENERAL

1.1 DECONTAMINATION REQUIREMENTS

The Contractor shall decontaminate all construction equipment (i.e., vehicles, excavators, hand tools, etc.) used during remediation activities and which have been used in the exclusion zones prior to demobilization from the site.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 CONSTRUCTION EQUIPMENT DECONTAMINATION

3.1.1 General

The Contractor shall decontaminate all construction equipment surfaces that have come into contact with contaminated soils, sediments, and liquids. Construction equipment items shall be decontaminated immediately upon completion of work in a particular area and prior to being moved to a new work area. However, if only the bucket of the excavation equipment comes in contact with contaminated material or enters the exclusion zone, the bucket may be cleaned of gross contamination, wrapped in plastic, and the excavation equipment moved to another work area. Construction equipment may enter the exclusion zone and work "clean" by placing a heavy (min. 40 mil) HDPE under the construction equipment tires and/or tracks such that they remain on the liner and do not come in contact with the contaminated materials. The Contractor must inspect the "barrier" liner to ensure contaminated materials do not cover the liner and come in contact with the equipment. If contaminated materials get on the liner, then the equipment tires and/or tracks will be decontaminated when the equipment leaves the exclusion zone. All equipment used in the exclusion zone shall be decontaminated prior to leaving the site. Approval by the Contracting Officer (CO) or his/her designee (Site Safety Officer) and documentation of this approval shall be provided by the Contractor prior to any vehicle leaving the site which has entered the exclusion zone.

3.1.2 Equipment and Personnel

The Contractor shall supply all equipment and materials necessary to properly decontaminate construction equipment used in remediation areas and which has entered the exclusion zone.

3.1.3 Decontamination Structures

The Contractor shall construct or provide heavy duty decontamination structures on-site that can accommodate all types of equipment used during site remediation. The Contractor shall maintain decontamination areas daily throughout the duration of the project. Decontamination areas shall be covered at the end of each shift to prevent the infiltration of precipitation. The Contractor shall remove

excess material and other debris from the decontamination pads or structures on a daily basis and these materials shall be handled and disposed with the other contaminated materials. The Contractor shall construct the decontamination area to prevent the infiltration of decontamination and rinsate fluids into underlying soils. At a minimum the constructed equipment decontamination areas shall be composed of a minimum 40 mil HDPE (or approved equivalent) geomembrane over- and underlain by a nonwoven protective geotextile as shown on the Drawings. The geomembrane may be overlain by a free draining material or flexible pavement section that is sloped to a collection sump. All liquids used for decontamination shall be collected and disposed of in a proper manner according to applicable regulations. The Contractor is responsible for the cleanup of any spills and infiltration into underlying soils at no expense to the Government.

The Contractor shall design and construct the decontamination structure to allow for the proper containment, collection, and temporary storage of all decontamination and rinsate fluids generated during equipment decontamination as well as precipitation. The minimum requirements for the decontamination area are shown on the Drawings. The Contractor shall specify the design of the decontamination pad in his Decontamination Plan as part of the Operations Plans. The Contractor shall specify in his Decontamination Plan the type of decontamination fluids and cleaners to be used for the decontamination of construction equipment. The decontamination fluids may be treated in a portable on-site treatment unit and must meet the discharge limits established; or, the Contractor may select to sample the liquid for characterization for treatment and disposal at a competitively selected permitted facility (on-site or off-site). The Contractor shall handle the fluids in accordance with Section 02141, DEWATERING LIQUIDS AND HANDLING.

3.1.4 Removal of Decontamination Structures

Upon completion of site activities, the Contractor shall remove the decontamination structure(s). If the decontamination structure is constructed on the ground, the materials used to construct the areas will be disposed of as materials containing hazardous constituents or as non-hazardous based on a sample analysis required by the accepting permitted facility. Two verification samples shall be collected by the Contractor from the soils under the decontamination area before the pad's construction and following its removal. The Contractor shall analyze these samples for total explosives, VOCs, semi-VOCs, and PCBs in accordance with the methods for verification samples presented in Tables 02010-1 and 02010-2. If contaminants of concern are found in excess of the established cleanup levels, and these levels exceed the concentrations detected prior to the pad's construction, the Contractor shall remove and properly dispose of the soils at a permitted facility at no expense to the Government.

3.1.5 Decontamination of Equipment in Contact with PCBs

For decontamination of equipment in contact with materials/liquids suspected or known to contain PCBs, the Contractor has the option of constructing a designated separate decontamination structure, since the materials used for this facility may be characterized as a hazardous waste upon project closure. Equipment contaminated with PCBs shall be decontaminated using a power steam-cleaner. Decontamination shall be verified by collecting a wipe sample from the parts of the equipment in contact with the PCB-containing material. The wipe sample shall be analyzed in accordance with Method 8082. Verification sampling of soils below the pad shall be collected and analyzed as specified in 3.1.4.

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02210 (December 1988)

Superseding

CEGS 02210 (April 1984)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

Includes note relocation Special change (August 1995)

Includes changes through Notice 6 (April 1996)

Latest Notice change indicated by \&\ tokens

SECTION 02210

BACKFILL AND GRADING FOR REMEDIATION AREAS

12/88

NOTE: This guide specification covers the requirements for grading, including excavation, filling and shaping of drainage ways. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.

PART 1 GENERAL

NOTE: This guide specification includes all excavating, grading, and associated operations that may be required under a construction contract, except excavating for buildings and utilities structures. Certain operations may not be applicable to the particular work or may be performed as subsidiary operations under other sections of the specifications. The Contracting Officer will delete any operations provided for in this specification that are not applicable to the work under consideration or that can be more expeditiously or advantageously performed under other sections. Each section will be modified as needed to fit local conditions. Where excavation for buildings or utilities systems is to be simultaneous with overlot grading, the priority of each operation will be definitely stated, and bids secured accordingly, so that overlapping of operations or conflict regarding prices for the various types of excavation will not develop. The work of clearing and grubbing will be handled generally in a separate section and therefore has not been included under this section. Where clearing and grubbing are only incidental in amount, such work will be included by insertion of the necessary clearing and grubbing requirements in this section of the specifications, including any necessary provisions for measurement and payment and by suitable indications on the drawings.

1.1 REFERENCES

NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1556 (1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D 1557 (1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))

ASTM D 2167 \&(1994)& Density and Unit Weight of Soil in Place by the Rubber Balloon Method

ASTM D 2487 (1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 2922 (1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D 3017 (1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

ASTMD 422 (1963; R 1990) Particle-Size Analysis of Soils

ASTMD 2216 (1990) Laboratory Determination of Water (Moisture) Content of Soil Rock, and Soil-Aggregate Mixtures

1.2 UNIT PRICE

1.2.1 Measurement

~~NOTE: When lump sum payment for work under this section is desired, this paragraph will be deleted, and paragraph PAYMENT will be revised accordingly. These paragraphs will be deleted when the work covered by this section of the specifications is included in one lump sum contract price for the entire work covered by the Invitation for Bids.~~

1.2.1.1 Excavation

The unit of measurement for excavation will be the cubic meter, (yard,) computed by the average end-area method from cross sections taken before and after the excavation and borrow operations. The amount (yardage) paid for will be the number of cubic meters (yards) of material, measured in its original position and removed from the excavation and borrow areas, including the excavation for ditches, gutters, and channel changes, soil remediation, pipeline access which material is acceptably utilized or disposed of as herein specified. The measurement will include the excavation below grade of unsatisfactory material where ordered, and allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the yardage excavated without authorization or the yardage of any material used for other than directed purposes. Amount (Yardage) of overburden stripped from borrow pits, unless used as borrow material, will not be paid for. The measurement will not include the amount (yardage) of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade.

The Contractor is required to provide proper support for all excavations to meet OSHA requirement for access of the Contractor's sampling personnel, if sampling personnel must enter the excavation area. This may include sloping, benching, or other excavation support methods to stabilize the sides of the excavation. The Contractor will perform this work in a manner that will minimize the amount of extraneous soil excavated or shoring materials used that may have to be disposed of as hazardous material.

1.2.1.2 Topsoil

~~NOTE: Topsoil will be separated, excavated, stored, and used for surface finish in preparation for seeding, sodding, or other planting only where the topsoil is definitely superior for grass and other plant growth as compared to the balance of the excavated materials. Generally, topsoil will be spread after building and other operations have been completed. When topsoil spreading is covered under a separate section of the specifications, this paragraph will be deleted.~~

Separate excavation, hauling, and spreading or piling of topsoil and all miscellaneous operations attendant thereto will be considered subsidiary obligations of the Contractor, covered under the contract unit price for excavation.

1.2.1.3 Overhaul

~~The unit of measurement for overhaul will be the station meter (yard). The number of station meters (yards) of overhaul to be paid for will be the product of the number of cubic meters (yards) of overhaul materials, measured in the original position, multiplied by the overhaul distance measured in stations of 100 meters. (100 feet.) The overhaul distance will be the distance in stations between the center of volume of the overhauled material in its original position and the center of volume after placing, minus the free haul distance in stations. The haul distance will be measured along the shortest route determined as feasible and satisfactory.~~

1.2.2 Payment

NOTE: When lump-sum payment for work under this section is desired, paragraph MEASUREMENT will be deleted, and this paragraph will be revised accordingly. These paragraphs will be deleted when the work covered by this section of the specifications is included in one lump-sum contract price for the entire work covered by the Invitation for Bids.

1.2.2.1 Excavation

NOTE: Where it is anticipated that borrow excavation for ditches and gutters will be only incidental in amount, these items will be included in a single contract unit price for excavation, and this paragraph will be modified accordingly.

Excavation will be paid for at the contract unit price per cubic meter (yard) for "Excavation."

1.2.2.2 Overhaul

Overhaul will be paid for at the contract unit price per station meter (yard) for "Overhaul."

1.3 DEFINITIONS

1.3.1 Satisfactory Materials

~~NOTE: Satisfactory material will be defined in accordance with locally available materials, design slopes, etc., and all suitable classes will be listed in the project specifications in accordance with ASTM D 2487.~~

Materials classified in ASTM D 2487 as SC, SM, CL and ML and free from roots and other organic matter, trash, debris, and frozen materials and stones larger than 150 mm (6 inches) in any dimension are satisfactory. Backfill materials shall possess similar gradation to the existing site fine-grained soils.

Satisfactory materials must also meet the NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-92-4046, Soil Clean-up Criteria for use as backfill material. The Contractor is encouraged to utilize the soils excavated from the remediation activities that have been shown through analytical testing, as specified in Section 02010: CONFIRMATION, VERIFICATION AND POST-INTERIM REMOVAL ACTION SAMPLING, to be below the clean-up criteria, if the moisture content of the soils is within a workable range to meet the compaction requirements of this specification. Off-site borrow sources for backfill material shall be approved by the Contracting Officer, based on physical and chemical testing results. The chemical analysis shall include total petroleum hydrocarbons, PCBs, TCLP metals, and volatile and semi-volatile organic compounds in accordance with SW-846 method (update III) at a frequency of one of each test per 2,000 yd³. A written and signed certification that the borrow source is environmentally clean and does not exceed any of the NYSDEC criteria for clean backfill may be provided by the supplier in clear of the chemical analysis as approved by the Contracting Officer.

1.3.2 Unsatisfactory Materials

~~NOTE: Unsatisfactory material will be defined in accordance with locally available materials, design slopes, etc., and all unsuitable classes will be listed in the project specifications in accordance with ASTM D 2487. Inapplicable portions in brackets will be deleted.~~

Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Materials classified in ASTM D 2487 as [____], CH, MH, Pt, OH, and OL are unsatisfactory. ~~[Unsatisfactory materials also include man-made fills, refuse, or backfills from previous construction.]~~

1.3.3 Cohesionless and Cohesive Materials

~~NOTE: When classification will be necessary during construction, determination of grain size for classification will be specified to be made in conformance with ASTM C 117, ASTM C 136, or ASTM D 422. ASTM standards selected for use will be listed in paragraph REFERENCES.~~

Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Materials classified as GM and SM will be identified as cohesionless only when the fines have a plasticity index of zero.

1.3.4 Degree of Compaction

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated below as a percent of laboratory maximum density.

1.3.5 Overhaul

~~NOTE: This paragraph is to be deleted when the earthwork is to be paid for under a lump sum contract.~~

Overhaul is the authorized transportation of satisfactory excavation or borrow materials in excess of the free-haul limit of [____] stations. Overhaul is the product of the quantity of materials hauled beyond the free-haul limit and the distance such materials are hauled beyond the free-haul limit, expressed in

station meters. (yards.)

1.3.6 Topsoil

Material obtained from offsite areas ~~[excavations]~~ ~~[areas indicated on the drawings]~~ suitable for topsoils, is defined as in Part 2 Materials, Paragraph 3.3 Topsoil.

1.4 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" where the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

1.4.1 Backfilling and Grading Plan; GA

Thirty calendar days after notice to proceed, the Contractor shall submit as part of the Site Operations Plan (see Section 01500: TEMPORARY CONSTRUCTION FACILITIES) a soil backfill staging and grading plan detailing the proposed backfilling and grading operations. The plan shall include a list of equipment, location (s) of backfill material borrow sources, sequence and timing of backfilling operations, qualifications of personnel in charge of operations and quality control. Quality control includes assuring the backfill material is suitable based on physical and chemical testing. The Plan shall specify the testing program to maintain suitable backfill materials. If the Contractor finds it necessary to modify the plan, he shall do so in writing and shall not change procedures until approval has been granted by the Contracting Officer.

SD-08 Statements

1.4.2 Field Testing Control; { GA }.

Qualifications of the commercial testing laboratory who will be performing all testing in accordance with paragraph FIELD TESTING CONTROL.

SD-09 Reports

1.4.3 Field Testing Control; { GA }. Satisfactory Materials; [GA].

Certified test reports and ~~chemical~~ analysis certifying that the satisfactory materials proposed for use at the project site conform to the specified requirements, and for all tests conducted in accordance with paragraph FIELD TESTING CONTROL.

1.5 SUBSURFACE DATA

Subsurface soil ~~boring logs~~ data are available in the form of test pit logs for the TNT Pipeline and are provided as an Attachment to Section 02228: FLUSHING AND CLOSURE IN PLACE OF TNT

~~PIPELINE [shown on the drawings] [appended to the \&SPECIAL CONTRACT REQUIREMENTS&\]. The subsoil investigation report and samples of materials taken Subsurface results from subsurface remedial investigations may be examined at [the U.S. Army Corps of Engineers, Baltimore District office by contacting Justina Wesley at 410-962-6734]. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring test pit locations.~~

PART 2 PRODUCTS

2.1 (ROCK FOR SLOPE PROTECTION) OMITTED

~~NOTE: Where hand placing of the coarse rock is necessary, this provision will be stated definitely in the specification, the brackets will be removed, and the approximate amounts and locations of the hand placing of coarse rock will be indicated. Where hand placing is not required, the inapplicable expression and all brackets will be deleted.~~

~~Coarse rock from excavations shall be conserved and used for constructing the slopes of embankments parallel or adjacent to streams, for constructing slopes or sides and bottom of channels, and for protection against erosion. [Hand placing of coarse rock from excavation will not be required.] [Hand placing of coarse rock from excavation will be required as indicated.]~~

2.2 BORROW MATERIAL

~~NOTE: Where a substantial quantity of borrow excavation is anticipated, the drawings and specifications will, where practicable, indicate the location or locations within the project site and conditions under which it may be obtained. The applicable statements will be retained and inapplicable statements and the brackets will be deleted.~~

Borrow material shall be selected to meet requirements and conditions of the particular fill for which it is to be used. Necessary clearing, grubbing, disposal of debris, and satisfactory drainage of borrow pits shall be performed by the Contractor as incidental operations to the borrow excavation.

2.2.1 Selection

Borrow materials shall be obtained from ~~[the borrow areas shown] [or] [approved sources outside the limits of Government controlled land] [or] [sources within the limits of Government controlled land, subject to approval].~~ Borrow material shall be selected to meet the requirements and conditions of the particular fill or embankment for which it is to be used and meet the definition for Satisfactory Materials. Borrow materials shall be subject to approval. ~~[Borrow material from approved sources on Government controlled land may be obtained without payment of royalties. Unless specifically provided, no borrow shall be obtained within the limits of the project site without prior written approval.] [The source of borrow material shall be the Contractor's responsibility. Unless otherwise provided in the contract, the Contractor shall obtain from the owners the right to procure material, shall pay all royalties and other charges involved, and shall bear all the expense of developing the sources, including rights-of-way for hauling.]~~ The Contractor will comply with all Federal, State, and local requirements for the excavation and reclamation of the borrow source(s). It shall be the responsibility of the Contractor to obtain and submit to the Contracting Officer all appropriate Federal, State, and local permits which may be required for the excavation and reclamation of the borrow sources.

2.2.2 Borrow Pits

~~NOTE: The requirements for measurement will be deleted when the contract is lump sum.~~

~~[The Contractor shall notify the Contracting Officer sufficiently in advance of the opening of any excavation or borrow pit to permit elevations and measurements to be taken of the undisturbed ground surface.] Except as otherwise permitted, borrow pits shall be excavated to afford adequate drainage. Overburden and other spoil material shall be disposed of or used for special purposes. Borrow pits shall be neatly trimmed [and left in such shape as will facilitate taking accurate measurements] after the excavation is completed.~~

2.3 TOPSOIL

2.3.1 General

Topsoil shall be fertile and friable surface soil, of good and uniform quality. Topsoil shall not contain subsoil materials. Top soil shall be free of refuse, hard clods, woody vegetation, stiff clay, construction debris, boulders, stones larger than two (2) inches, hydrocarbons, petroleum, materials or chemicals toxic to plants, and other deleterious material.

2.3.2 Organic Content

Topsoil shall have a minimum organic content of five (5) percent by weight. The organic content shall be increased by adding humus in the form of partially or completely decomposed leaf mold or approved organic matter at a rate necessary to attain the minimum organic content specified. The organic content of soils shall be determined by the Contracting Officer-approved laboratory utilizing the method described in the ASTM 2974.

2.3.3 Particle Size

The particle size of topsoil shall be determined by the laboratory using ASTM D422. The gradation of the topsoil shall be within the following ranges:

Size	Percent Passing
2-inch	100%
1-inch	85 to 100%
1/4-inch	65 to 100%
#200 sieve	20 to 80%

2.3.4 pH

Topsoil shall have a pH value within a range of 5.5 to 7.6.

2.3.5 Topsoil Sources

The Contractor shall identify the off-site topsoil sources for approval by the Contracting Officer. The contractor shall allow for the Contracting Officer to inspect the source of topsoil and collect any necessary samples for analytical analysis. The Contractor is responsible for any physical testing of materials as required to meet the material specification. The Contractor shall also perform chemical

analysis on a topsoil sample for volatile and semivolatile organic compounds, pesticides, PCBs, and TCLP metals in accordance with SW-846 methods (update III) at a frequency of one of each test per 2,000 yd³.

2.4 FINAL BACKFILL MATERIAL

Final backfill shall consist of (a) NYSDOT-type 2 base course when placed in locations beneath roadways and sidewalks, or within 10 feet of roadways or structures (b) satisfactory materials as defined in Subsection 1.3.1 when placed in locations other than beneath roadways and sidewalks, or within 10 feet of roadways or structures and is shown as common backfill on the drawings.

PART 3 EXECUTION

3.1 CONSERVATION OF TOPSOIL OMITTED

~~NOTE: Topsoil will be separated, excavated, stored, and used for surface finish in preparation for seeding, sodding, or other planting only where the topsoil is definitely superior for grass and other plant growth as compared to the balance of the excavated materials. Generally, topsoil will be spread after building and other operations have been completed. When topsoil spreading is covered under a separate section of the specifications, this paragraph will be deleted.~~

Where indicated, topsoil shall be removed to a depth of [] millimeters (4 inches) without contamination with subsoil and stockpiled convenient to areas for later application or at locations specified. Topsoil shall be removed to full depth and shall be stored separate from other excavated materials and piled free of roots, stones, and other undesirable materials. Any surplus of topsoil from excavations and grading shall be [stockpiled in locations indicated] ~~[removed from the site].~~

3.2 EXCAVATION

~~NOTE: If grouping of materials appears desirable because of existing varying subsurface conditions, as determined by observation or core borings, the specification provisions governing such requirements, including requirements for blasting, if necessary, will be inserted.~~

~~After topsoil removal has been completed, excavation of every description, regardless of material encountered, within the grading limits of the project shall be performed to the lines and grades indicated. Satisfactory excavation material shall be transported to and placed in fill areas within the limits of the work. All unsatisfactory material [including any soil which is disturbed by the Contractor's operations or softened due to exposure to the elements and water] and surplus material shall be [removed from site] [disposed of at locations indicated on the plans] [disposed of in areas approved for surplus material storage]. [In the event that it is necessary to remove unsatisfactory material to a depth greater than specified, the Contracting Officer shall be notified and an adjustment in the contract price will be considered in accordance with the contract.] [Unsatisfactory material excavated below the grade shown and replaced with satisfactory material as directed shall be included in the contract unit price for excavation.] Excavations carried below the depths indicated, without specific directions, shall, except as otherwise specified, be refilled to the proper grade with satisfactory material as directed. All additional work of this nature shall be at the Contractor's expense. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times.~~

~~Excavations shall be kept free from water while construction therein is in progress. Material required for fills in excess of that produced by excavation within the grading limits shall be obtained from borrow areas.~~

~~The final excavations of all remediated areas shall be dewatered prior to backfilling after the verification sampling has indicated that the final depths have been achieved and the excavation surveyed to determine the quantities of soil removed. Dewatering shall be in accordance with Section 02141 LIQUIDS HANDLING AND DISPOSAL.~~

3.3 DITCHES, GUTTERS, AND CHANNEL CHANGES

Ditches, gutters, and channel changes shall be cut accurately to the cross sections and grades indicated. All roots, stumps, rock, and foreign matter in the sides and bottom of ditches, gutters, and channel changes shall be trimmed and dressed or removed to conform to the slope, grade, and shape of the section indicated. Care shall be taken not to excavate ditches and gutters below the grades indicated. Excessive ditch and gutter excavation shall be backfilled to grade either with satisfactory, thoroughly compacted material or with suitable stone or cobble to form an adequate gutter paving as directed. All ditches and gutters excavated under this section shall be maintained until final acceptance of the work. ~~Satisfactory material excavated from ditches and channel changes shall be placed in fill areas. Unsatisfactory and excess excavated material shall be disposed of in accordance with directions in paragraph EXCAVATION.~~ No excavated material shall be deposited closer to the edges of the ditches than indicated and in no case less than ~~1 meter~~ (3 feet.)

3.4 BACKFILL ADJACENT TO STRUCTURES

Backfill adjacent to structures shall be placed and compacted uniformly in such manner as to prevent wedging action or eccentric loading upon or against the structures. Slopes bounding or within areas to be backfilled shall be stepped or serrated to prevent sliding of the fill. During backfilling operations and in the formation of embankments, equipment that will overload the structure in passing over and compacting these fills shall not be used. Backfill for storm drains and subdrains, including the bedding and backfill for structures other than culverts and drains, shall conform to the additional requirements in other applicable sections.

3.5 PREPARATION OF ~~GROUND EXCAVATION~~ SURFACE FOR BACKFILL

~~All vegetation, such as roots, brush, heavy sods, heavy growth of grass, and all decayed vegetable matter, rubbish, and other unsatisfactory material within the area upon which fill is to be placed, shall be stripped or otherwise removed before the fill is started. In no case will unsatisfactory material remain in or under the fill area. Sloped ground surfaces steeper than one vertical to four horizontal on which fill is to be placed shall be plowed, stepped, or broken up, as directed, in such manner that the fill material will bond with the existing surface. Prepared surfaces on which compacted fill is to be placed shall be wetted or dried as may be required to obtain the specified moisture content and density.~~

~~Before fill placement commences, the exposed final excavation surfaces shall be proofrolled. A minimum of four passes of a smooth drum roller or tamper shall be completed over the entire subgrade within the area to be filled. Following completion of this activity, the entire exposed surface shall be visually inspected by the Contracting Officer. Should any soft, loose, or otherwise unstable areas be detected by the visual inspection, these areas shall be recompact to densify these materials to the satisfaction of the Contracting Officer. If these materials cannot be densified sufficiently by the additional proofrolling, they shall be stabilized with the placement of AASHTO No. 57 stone and/or geotextile that is placed on or worked into these soft areas.~~

3.6 BACKFILLS AND EMBANKMENTS

Backfill and embankments shall be constructed placed at the locations and to lines and grades indicated. The completed fill shall conform to the shape of the typical sections grades indicated on the Drawings or shall meet the requirements of the particular case. Satisfactory material obtained during excavation may be used in forming required backfill. Backfill shall be satisfactory material and shall be reasonably free from roots, other organic material, and trash and from stones having a maximum diameter greater than 150 mm (6 inches). No frozen material will be permitted in the fill. Stones having a dimension greater than 100 mm (4 inches) shall not be permitted in the upper 150 mm (6 inches) of fill or embankment. The approved backfill material shall be placed in successive horizontal layers of {200} ({8}) [] {300} mm ({12} inches) 12 inches in loose depth for the full width of the cross section and shall be compacted as specified. Each layer shall be compacted before the overlaying lift is placed. Moisture content of the fill or backfill material shall be adjusted by wetting or aerating, as required, to achieve the required degree of compaction within plus or minus {2} percent of optimum moisture content for cohesive materials and within 5 percent for non cohesive materials as determined from laboratory tests specified in paragraph DEFINITIONS.

3.7 COMPACTION

NOTE: Where the overall or overlot grading areas include roadways or other paved areas, the drawings will clearly indicate the locations and extent of the areas where compaction requirements suitable for paved areas will be required. Compaction requirements will be used to meet the particular condition. If there will be paved areas, the first choice below will be inserted or the second choice will be inserted if compaction requirements are not shown in tabular form on the plans:

Except for paved areas and areas adjacent to structures, each layer of the fill or embankment shall be compacted to at least 90 [] 88 percent of laboratory maximum density as determined by ASTM D 1557/1597, Modified Proctor. Areas to be paved or within 10 feet of a roadway or structure shall be compacted to 95 percent of laboratory maximum density. [Areas to be paved and other areas indicated as requiring compaction suitable for paved areas shall be compacted to at least the percentage of laboratory maximum density shown for specific ranges of depth below the surface of the pavement.] [Areas to be paved and other areas indicated as requiring compaction suitable for paved areas shall be compacted to at least the percentage of laboratory maximum density shown in the following tabulation for specific ranges of depth below the surface of the pavement:

Percentage of Laboratory Maximum Density Required

Dept	Fill	Fill	Cut	Cut
Below				
Pavement				
Surface	Cohesive	Cohesionless	Cohesive	Cohesionless
(inches)	Materials	Materials	Materials	Materials
From:				
To:				

3.8 FINISHED EXCAVATION, FILLS, AND EMBANKMENTS

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified. Ditches and gutters shall be finished to permit adequate drainage.

The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. For subgrade areas to be paved, the following shall be accomplished as required: (a) soft or otherwise unsatisfactory material shall be replaced with satisfactory excavated material or other approved materials; ~~(b) rock encountered in the cut sections shall be excavated to a depth of 150 mm (6 inches) below finished grade for the subgrade;~~ (b) low areas resulting from removal of unsatisfactory material or from excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and shall be compacted as specified. The surface of embankments or excavated areas for road construction or other areas on which a base course or pavement is to be placed shall vary not more than 15 mm (0.05 foot) from the established grade and approved cross section. Surfaces other than those that are to be paved shall be finished not more than 45 mm (0.15 foot) above or below the established grade or approved cross section.

3.9 PLACING TOPSOIL

~~NOTE: Topsoil will be separated, excavated, stored, and used for surface finish in preparation for seeding, sodding, or other planting only where the topsoil is definitely superior for grass and other plant growth as compared to the balance of the excavated materials. Generally, topsoil will be spread after building and other operations have been completed. When topsoil spreading is covered under a separate section of the specifications, this paragraph will be deleted.~~

On areas to receive topsoil, the compacted subgrade soil shall be scarified to a 50 mm (2 inch) depth for bonding of topsoil with subsoil. Topsoil then shall be spread evenly to a thickness of ~~[] mm () inches~~ and graded to the elevations and slopes shown. Topsoil shall not be spread when frozen or excessively wet or dry. Material required for topsoil in excess of that produced by excavation within the grading limits shall be obtained from ~~[off-site areas;] [areas indicated].~~

3.10 FIELD TESTING CONTROL

~~NOTE: Field density tests are normally performed at a frequency of one test for every 500 square meters (5000 square feet) of area being prepared. Other frequency intervals may be specified when conditions warrant.~~

Testing shall be the responsibility of the Contractor and shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Field density and moisture content tests of ~~backfill areas~~ shall be performed on every ~~[] 10,000 square meters (feet)~~ of each ~~[12] millimeter (inch) lift~~ placed with a minimum of 2 tests per 12-inch lift per material type. Field in-place density shall be determined in accordance with ~~[ASTM D 1556] [ASTM D 2167] [ASTM D 2922]~~. ~~[When ASTM D 2922 is used, the calibration curves shall be checked, and adjusted if necessary, using the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job on each different type of material encountered and at intervals as directed.~~

3.11 FINAL GRADING

3.11.1 Disturbed Areas General

Perform grading operations so that all excavations will be well-drained at all times. Maintain diversions and keep them free from soil, debris, and leaves until final acceptance of the work. Finish grading all remediation

areas to preconstruction or natural contours or as directed by the Contracting Officer to promote surface water drainage and to prevent ponding or collection of surface water. Perform the grading work in proper sequence with all other associated operations.

3.11.2 Disturbed Areas

Grade all areas disturbed during the work of the Contract. At trench locations, excavated and fill areas, and adjacent transitions areas, grade so the finished surfaces are at the proposed grade or are approximately at grades existing prior to being disturbed. Adjust as required to provide positive drainage.

3.11.3 Final Grading, Seeding and Stabilization

All final grading, seeding, and stabilization shall be in accordance with the final approved Erosion and Sedimentation Control (E&SC) Plan.

3.11.4 Site Management Controls

Implement, place and install all site management controls in accordance with these Specifications.

3.12 PROTECTION

~~NOTE: When required, erosion control materials and methods should be specified according to applicable provisions of Section 02935 TURF.~~

Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades reestablished to the required elevations and slopes. All work shall be conducted in accordance with the environmental protection requirements of the contract.

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02222 (July 1989)

Superseding
CEGS-02221 (September 1986)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~
~~Includes changes through Notice 7 (May 1995) Includes Text Adjustment 1 (March 1991)~~
~~Latest Notice change indicated by \&\ tokens~~

SECTION 02222

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS 07/89

~~NOTE: This guide specification covers the requirements for excavation, trenching, and backfilling for utilities systems to the points of connection within 1.5 m (5 feet) of the buildings. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.~~

PART 1 GENERAL

This specification applies to underground utilities encountered within remediation areas that require moving to accomplish the specified remediation work. Excavation of remediation areas shall be performed in accordance with the specification for that particular area. Backfilling of remediation areas shall be performed in accordance with Section 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS.

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	(1963; R 1990) Particle-Size Analysis of Soils
ASTM D 1556	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. [2,700 kN-m/cu. m.])

ASTM D 2167	(1994)&\ Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2487	(1993) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

1.2 MEASUREMENT AND PAYMENT

NOTE: The paragraph as written contemplates taking bids on a unit-price basis. When it is determined that a lump-sum contract may be more advisable, the paragraph will be deleted.

All measurement and payment will be based on completed work performed in accordance with the drawings and specifications.

1.2.1 Trench Excavation

NOTE: This paragraph will be coordinated with the payment paragraphs of appropriate contract sections to ensure that there are no dual payments or omission of payment for trench excavation. There shall be separate payment items established for trench excavation for each different size of pipe in the contract. Payment for trench excavation for heat-distribution system and for underground electrical-distribution system may be excluded for payment from this paragraph and included in payment under the appropriate utility section when the work is of such a nature and extent and so clearly indicated that the excavation quantities involved can be estimated with reasonable accuracy.

Trench excavation shall be the number of linear meters (feet) measured along the centerline of the trench and excavated to the depths and widths specified for the particular size of pipe. No increase shall be made for the extra width required at manholes and similar structures. Payment for trench excavation as so measured shall constitute full payment for excavation and backfilling, [including specified overdepth] except in rock or unstable trench bottoms. Unstable trench bottoms shall be replaced by select granular material and paid for as specified below. Trench excavation shall also include the additional width at manholes and similar structures, the furnishing, placing and removal of sheeting and bracing, pumping and bailing, and all incidentals necessary to complete the work required by this section.

1.2.2 Rock Excavation

Rock excavation shall be measured and paid for by the number of cubic meters (yards) of acceptably excavated rock material. The material shall be measured in place, but volume shall be based on a maximum 750 mm (30 inch) width for pipes 300 mm (12 inches) (12 inches) in diameter or less, and a maximum width of 400 mm (16 inches) greater than the outside diameter of the pipe for pipes over 300 mm (12 inches) (12 inches) in diameter. The measurement shall include all authorized overdepth rock excavation as determined by the Contracting Officer. For manholes and other appurtenances,

volumes of rock excavation shall be computed on the basis of 300 mm (1 foot) outside of the wall lines of the structures. Payment for rock excavation shall be made in addition to the price bid for the trench excavation, and shall include all necessary drilling and blasting and all incidentals necessary to excavate and dispose of the rock. Backfill replacing rock excavation shall not be paid for separately, but shall be included in the unit price for rock excavation.

1.2.3 Sheeting and Bracing

Sheeting and bracing when shown or authorized by the Contracting Officer to be left in place, shall be paid for as follows: [].

1.2.3.1 Timber Sheeting

Timber sheeting shall be paid for as the number of board feet of lumber below finish grade measured in place prior to backfilling. Sheeting wasted when cut off between the finished grade and 300 mm (1 foot) below the finished grade also shall be included in the measurement.

1.2.3.2 Steel Sheeting and Soldier Piles

NOTE: The blank will be filled with an appropriate number not greater than 1 meter (3 feet). However, if the quantities of sheeting involved are anticipated to be substantial, and since the cut off steel can be sold by the Contractor as scrap, the whole part in brackets can be deleted and no payment provided for wasted cut off ends.

Steel sheeting, soldier piles, and steel bracing shall be paid for according to the number of pounds of steel calculated. This calculation shall be made by multiplying the measured in-place length in meters (feet) below finish grade by the unit weight of the section in kg per meter. (pounds per foot.) Unit weight of rolled steel sections shall be obtained from recognized steel manuals. [Sheeting wasted when cut off between the finished grade and a distance of up to [] meters (feet) below the finished grade also shall be included in the measurement.]

1.2.4 Select Granular Material

Select granular material shall be measured in place as the actual cubic yards replacing wet or unstable material in trench bottoms [within the limits shown] [in authorized overdepth areas]. The unit price shall include furnishing and placing the granular material, excavation and disposal of unsatisfactory material, and additional requirements for sheeting and bracing, pumping, bailing, cleaning, and other incidentals necessary to complete the work. Payment for select granular material shall be made in addition to the bid price for trench excavation.

1.3 DEFINITIONS

1.3.1 Degree of Compaction

Degree of compaction shall be expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

1.4 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

~~*****~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-09 Reports

Field Density Tests; [GA]. Testing of Backfill Materials; [GA].

Copies of all laboratory and field test reports within 24 hours of the completion of the test.

PART 2 PRODUCTS

2.1 MATERIALS

~~*****~~

~~NOTE: Satisfactory material will be defined in accordance with locally available materials, type of installation, etc., and all satisfactory classes will be listed in the contract specification in accordance with the Unified Soil Classification System (ASTM D 2487).~~

~~*****~~

2.1.1 Satisfactory Materials

Materials classified in ASTM D 2487 as GW, GP, GC, GM, SW, SP, SC, SM, CL and ML and free from roots and other organic matter, trash, debris, and frozen materials and stones larger than 12 inches in any dimension are satisfactory.

Satisfactory materials must also meet the NYSDEC, Division of Hazardous Waste Remediation, TAGM HWR-92-4046, Soil Clean-up Criteria for use as backfill material. The Contractor is encouraged to utilize the soils excavated from the remediation activities that have been shown through analytical testing to be below the clean-up criteria, if the moisture content of the soils is within a workable range to meet the compaction requirements of this specification. Off-site borrow sources for backfill material shall be approved by the Contracting Officer, based on physical and chemical testing results. The chemical analysis shall include total petroleum hydrocarbons, PCBs, TCLP metals and volatile and semi-volatile organic compounds at a frequency of one of each test per 2,000 yd³. A written and signed certification that the borrow source is environmentally clean and does not exceed any of the NYSDEC criteria for clean backfill may be provided by the supplier in clear of the chemical analysis as approved by the Contracting Officer.

2.1.2 Unsatisfactory Materials

~~*****~~

~~NOTE: Unsatisfactory material will be defined in accordance with locally available materials, type of installation, etc., and all unsatisfactory classes will be listed in the project specification in accordance with the Unified Soil Classification System (ASTM D 2487). Normally stones larger than 75 mm (3~~

inches) are considered unsatisfactory.

Unsatisfactory materials shall be materials that do not comply with the requirements for satisfactory materials. Unsatisfactory materials include but are not limited to those materials containing roots and other organic matter, trash, debris, frozen materials and stones larger than 3 millimeters, (inches,) and materials classified in ASTM D 2487, as CH, MH, PT, OH, and OL. Unsatisfactory materials also include man-made fills or refuse, or backfills from previous construction.

2.1.3 Cohesionless and Cohesive Materials

Cohesionless materials shall include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM and SM will be identified as cohesionless only when the fines are nonplastic.

2.1.4 Rock

Rock shall consist of boulders measuring 1/2 cubic meter (1/2 cubic yard) or more and materials that cannot be removed without systematic drilling and blasting such as rock material in ledges, bedded deposits, unstratified masses and conglomerate deposits, and below ground concrete or masonry structures, exceeding 1/2 cubic meter (1/2 cubic yard) in volume, except that pavements will not be considered as rock.

2.1.5 Unyielding Material

NOTE: ~~Stones should generally not exceed 75 mm (3 inches) in diameter. However, pipe manufacturer's criteria, if any, should be used.~~

Unyielding material shall consist of rock and gravelly soils with stones greater than [3] millimeters (inches) in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.6 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

2.1.7 Select Granular Material

NOTE: ~~Maximum size of aggregate should be not more than 8 mm per 100 mm (1 inch per foot) of pipe diameter, or 75 mm (3 inches) maximum. Refer to pipe manufacturer's criteria for more stringent requirements, if any, on aggregate size and gradation.~~

Select granular material shall meet the requirements of NYSDOT Type 2 subbase course, consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a 0.075 mm (No. 200) mesh sieve and no less than 95 percent by weight passing the 25 mm (1 inch) sieve. The maximum allowable aggregate size shall be [2] millimeters, (inches,) or the maximum size recommended by the pipe manufacturer, whichever is smaller.

2.1.8 Initial Backfill Material

Initial backfill shall consist of select granular material ~~or satisfactory materials~~ free from rocks ~~[1 1/2] millimeters (inches)~~ or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. When the pipe is coated or wrapped for corrosion protection, the initial backfill material shall be free of stones larger than ~~[3/4] millimeters (inches)~~ in any dimension or as recommended by the pipe manufacturer, whichever is smaller.

2.1.9 Final Backfill Material

Final backfill shall consist of: a) select granular material as defined in Section 2.1.7 when pipe is placed in locations beneath roadways and sidewalks, or within 10 feet of roadways or structures and is shown as NYSDOT TYPE 2 Subbase course; b) satisfactory materials as defined in Section 2.1.1 when pipe is placed in locations other than beneath roadways and sidewalks or within 10 feet of roadways or structures and is shown as Common Backfill on the Drawings.

2.1.10 Plastic Marking Tape

~~NOTE: The use of plastic marking tape for identification purpose will be mandatory for buried hazardous utilities such as electrical conduit, gas line, high pressure nitrogen, high pressure water line, domestic sewage force mains and industrial waste force mains, industrial sewers carrying hazardous, explosive or toxic waste. Tape should be used for all plastic or other nonferrous pipes and for ferrous pipes buried to depths such that the top of the pipe is more than 1 meter (3 feet) deep. Tape will be optional for nonhazardous utility lines such as domestic wastewater sewers (gravity) or storm drains.~~

Plastic marking tape shall be acid and alkali-resistant polyethylene film, ~~152 mm (6 inches)~~ (6 inches) wide with minimum thickness of ~~0.102 mm (0.004 inch)~~ (0.004 inch). Tape shall have a minimum strength of ~~12.1 MPa (1750 psi)~~ (1750 psi) lengthwise and ~~10.3 MPa (1500 psi)~~ (1500 psi) crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to ~~1 meter (3 feet)~~ deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in TABLE 1 and shall bear a continuous printed inscription describing the specific utility.

TABLE 1. Tape Color

Red:	Electric
Yellow:	Gas, Oil, Dangerous Materials
Orange:	Telephone, Telegraph, Television, Police, and Fire Communications
Blue:	Water Systems
Green:	Sewer Systems

PART 3 EXECUTION

3.1 EXCAVATION

~~NOTE: The details of disposal of excavated materials should be specified here. If dewatering is~~

~~required due to ground water conditions, a paragraph on dewatering procedures and requirements should be developed.~~

~~*****~~

Excavation shall be performed to the lines and grades indicated. Rock excavation shall include removal and disposition of material defined as rock in paragraph MATERIALS. Earth excavation shall include removal and disposal of material not classified as rock excavation. During excavation, material satisfactory for backfilling shall be stockpiled in an orderly manner at a distance from the banks of the trench equal to 1/2 the depth of the excavation, but in no instance closer than ~~600 mm (2 feet)~~. Excavated material not required or not satisfactory for backfill shall be removed from the site. ~~If this material is suspected of being contaminated, it shall be disposed of in accordance with Section 02120 for shall be disposed of by []~~. Grading shall be done as may be necessary to prevent surface water from flowing into the excavation, and any water accumulating therein shall be removed to maintain the stability of the bottom and sides of the excavation. Unauthorized overexcavation shall be backfilled in accordance with paragraph BACKFILLING AND COMPACTION at no additional cost to the Government.

3.1.1 Trench Excavation

~~*****~~

~~NOTE: The width of the trench below the top of the pipe will depend on the type of pipe used and soil conditions. The pipe manufacturer's installation manual should provide this information, and if so, it will be followed. In general, the width of trench will be 300 mm (12 inches) to 600 mm (24 inches), plus pipe O.D. for smaller pipe sizes, and 600 mm (24 inches) to 900 mm (36 inches) plus pipe O.D. for larger pipe sizes. Sloping walls below the top of the pipe are allowed for certain types of pipe in special ground conditions.~~

~~*****~~

The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than ~~[4] meters (feet)~~ high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Vertical trench walls more than ~~[4] meters (feet)~~ high shall be shored. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. ~~All trench excavation and shoring shall be in accordance with OSHA regulations.~~ The trench width below the top of pipe shall not exceed ~~600 mm (24 inches) (24 inches)~~ plus pipe outside diameter (O.D.) for pipes of less than ~~600 mm (24 inches) (24 inches)~~ inside diameter and shall not exceed ~~900 mm (36 inches) (36 inches)~~ plus pipe outside diameter for sizes larger than ~~600 mm (24 inches) (24 inches)~~ inside diameter. Where recommended trench widths are exceeded, redesign, stronger pipe, or special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor without any additional cost to the Government.

3.1.1.1 Bottom Preparation

~~*****~~

~~NOTE: Stones 75 mm (3 inches) or greater should be removed. However, pipe manufacturer's criteria, if any, should be used.~~

~~*****~~

The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of ~~[—2—]~~ millimeters (inches) or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

3.1.1.2 Removal of Unyielding Material

~~NOTE: Minimum of 100 mm (4 inches) should be removed to produce a suitable cushion for the pipe.~~

Where ~~[overdepth is not indicated and]~~ unyielding material is encountered in the bottom of the trench, such material shall be removed ~~[—6—]~~ millimeters (inches) below the required grade and replaced with suitable materials as provided in paragraph BACKFILLING AND COMPACTION.

3.1.1.3 Removal of Unstable Material

Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with select granular material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the fault or neglect of the Contractor in his performance of the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Government.

3.1.1.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be ~~[sufficient to leave at least 300 mm (12 inches) clear between the outer structure surfaces and the face of the excavation or support members.]~~ ~~[of sufficient size to permit the placement and removal of forms for the full length and width of structure footings and foundations as shown.]~~ Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

3.1.1.5 Jacking, Boring, and Tunneling

~~NOTE: In situations where utility lines must be installed more than 5 to 7 meters (15 to 20 feet) below ground surface, through embankments, under minor roads or parking areas, or where surface conditions make it difficult or impractical to excavate open trenches, utility lines may be installed by jacking, boring, or tunneling as a contractor option. Where operational requirements preclude installation by trenching, the use of jacking, boring, or tunneling should be specified as mandatory alternatives. This requirement will normally exist where utilities must cross railroads, highways, primary access roads and airfield pavements. Pipe and conduit smaller than 900 mm (36 inches) in diameter will normally be installed in smooth steel pipe casing. Designing engineers must coordinate with installation facility engineers to identify and validate utility crossings where jacking, boring, or tunneling will be specified as mandatory.~~

Unless otherwise indicated, excavation shall be by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Contracting Officer, the pipe, cable, or duct can be

safely and properly installed and backfill can be properly compacted in such sections.

3.1.1.6 Stockpiles

Stockpiles of satisfactory and contaminated materials shall be in accordance with 02226 ~~[and unsatisfactory]~~ ~~[and wasted materials]~~ shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber tired equipment, excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to the Government. ~~[Locations of stockpiles of satisfactory materials shall be [as shown] [subject to prior approval of the Contracting Officer].]~~

3.2 BACKFILLING AND COMPACTION

Backfill material shall consist of satisfactory material, select granular material, or initial backfill material as required. Backfill shall be placed in layers not exceeding 150 mm (6 inches) loose thickness for compaction by hand operated machine compactors, and 200 mm (8 inches) loose thickness for other than hand operated machines, unless otherwise specified. Each layer shall be compacted to at least 95 percent maximum density for cohesionless soils and 90 percent maximum density for cohesive soils, unless otherwise specified.

3.2.1 Trench Backfill

NOTE: Most pressure tests require backfilling to at least 600 mm (2 feet) over the pipe with the joints and couplings left open for inspection.

Trenches shall be backfilled to the grade shown. ~~[The trench shall be backfilled to [] meters (feet) above the top of pipe prior to performing the required pressure tests. The joints and couplings shall be left uncovered during the pressure test.] [The trench shall not be backfilled until all specified tests are performed.]~~

3.2.1.1 Replacement of Unyielding Material

Unyielding material removed from the bottom of the trench shall be replaced with select granular material or initial backfill material.

3.2.1.2 Replacement of Unstable Material

Unstable material removed from the bottom of the trench or excavation shall be replaced with select granular material placed in layers not exceeding 150 mm (6 inches) loose thickness.

3.2.1.3 Bedding and Initial Backfill

NOTE: Bedding is provided to level out any irregularities in the foundation and to assure uniform support along the barrel of each pipe section. Bedding is also constructed to distribute the load bearing reaction, due to the weight of the backfill material, around the lower portion of the pipe. If the pipe

~~or conduit is placed directly on a flat or shaped foundation, delete "bedding" from the title and from any reference in the paragraph. If bedding will be specified, determine type and thickness and show on the plans. Specify compaction to 95 percent maximum density for cohesionless soils, and 90 percent maximum density for cohesive soils.~~

{Bedding shall be of the type and thickness shown.} Initial backfill material shall be placed and compacted with approved tampers to a height of at least one foot above the utility pipe or conduit. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. Care shall be taken to ensure thorough compaction of the fill under the haunches of the pipe.

3.2.1.4 Final Backfill

The remainder of the trench, ~~except for special materials for roadways, railroads and airfields,~~ shall be filled with ~~final backfillsatisfactory~~ material. Final ~~b~~Backfill material shall be placed and compacted as follows:

a. ~~Sidewalks and Structures: Final backfill material placed beneath roadways and sidewalks, or within 10 feet of roadways or structures shall meet the requirement of Part 3.2.~~

a. ~~Roadways, Railroads, and Airfields: Backfill shall be placed up to the elevation at which the requirements in Section 02225 EARTHWORK FOR ROADWAYS, RAILROADS, AND AIRFIELDS control. Water flooding or jetting methods of compaction will not be permitted.~~

bba. ~~Sidewalks, Turfed or Seeded Areas and Miscellaneous Areas: Final backfill (final 6 to 12 inch lift) shall be deposited in layers of a maximum of 300 mm (12 inch) loose thickness, and compacted to 85 percent maximum density for cohesive soils and 90 percent maximum density for cohesionless soils. [Water flooding or jetting methods of compaction will be permitted for granular noncohesive backfill material. Water jetting shall not be allowed to penetrate the initial backfill.] [Compaction by water flooding or jetting will not be permitted.] This requirement shall also apply to all other areas not specifically designated above.~~

3.2.2 Backfill for Appurtenances

~~NOTE: The number of days the concrete is allowed to cure before backfilling the structure will depend on the type of mix and the concrete strength requirements specified. Three days would be considered as a minimum.~~

After the manhole, catchbasin, inlet, or similar structure has been constructed {and the concrete has been allowed to cure for ~~7~~ days}, backfill shall be placed in such a manner that the structure will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

3.3 SPECIAL REQUIREMENTS

Special requirements for both excavation and backfill relating to the specific utilities are as follows:

3.3.1 (Gas Distribution) OMITTED

Trenches shall be excavated to a depth that will provide not less than 450 mm (18 inches) of cover in rock excavation and not less than 600 mm (24 inches) of cover in other excavation. Trenches shall be graded as specified for pipe laying requirements in Section 02685 GAS DISTRIBUTION SYSTEM.

3.3.2 Water Lines

NOTE: Minimum depth of cover will be that required for frost penetration in the region and for safe operation of the utility. For fire protection yard mains, reference is made to NFPA 24 for recommended depth of cover.

Trenches shall be of a depth to provide a minimum cover of ~~3~~ [] meters (feet) from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe. ~~[For fire protection yard mains or piping, an additional [] millimeters (inches) of cover is required.]~~

3.3.3 (Heat Distribution System) OMITTED

~~Initial backfill material shall be free of stones larger than 6.3 mm (1/4 inch) in any dimension.~~

3.3.4 Electrical Distribution System

Direct burial cable and conduit or duct line shall have a minimum cover of ~~600 mm~~ (24 inches) from the finished grade, unless otherwise indicated. [Special trenching requirements for direct-burial electrical cables and conduits are specified in Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.]

3.4.4.1 Relocation of Underground Electrical Wiring

The Contractor shall be responsible for locating all electrical wiring in the vicinity of his work. The Contractor shall either temporarily relocate electrical wiring or shall provide adequate protection so as to ensure no damage to the existing wiring. The Contractor shall ensure continuous and uninterrupted electric supply unless otherwise directed by the Contracting Officer. Prior to the relocation of any wiring, the Contractor must submit a relocation plan to the Contracting Officer. If temporary service is provided, the Contractor shall ensure that permanent service is restored as soon as possible upon completion of the activity.

3.3.5 Plastic Marking Tape

NOTE: ~~The use of plastic marking tape for identification purpose will be mandatory for buried hazardous utilities such as electrical conduit, gas line, high pressure nitrogen, high pressure water line, domestic sewage force mains and industrial waste force mains, industrial sewers carrying hazardous, explosive or toxic waste. Tape should be used for all plastic or other nonferrous pipes and for ferrous pipes buried to depths such that the top of the pipe is more than 1 meter (3 feet) deep. Tape will be optional for nonhazardous utility lines such as domestic wastewater sewers (gravity) or storm drains.~~

Warning tapes shall be installed directly above the pipe, at a depth of ~~[450] ([18])~~ [] millimeters (inches) below finished grade unless otherwise shown.

3.4 TESTING

Testing shall be the responsibility of the Contractor and shall be performed at no additional cost to the Government.

3.4.1 Testing Facilities

Tests shall be performed by an approved commercial testing laboratory or may be tested by facilities furnished by the Contractor. No work requiring testing will be permitted until the facilities have been inspected and approved by the Contracting Officer. The first inspection shall be at the expense of the Government. Cost incurred for any subsequent inspection required because of failure of the first inspection will be charged to the Contractor.

3.4.2 Testing of Backfill Materials

Characteristics of backfill materials shall be determined in accordance with particle size analysis of soils ASTM D 422 and moisture-density relations of soils ASTM D 1557. A minimum of one particle size analysis and one moisture-density relation test shall be performed on each different type of material used for bedding and backfill.

3.4.3 Field Density Tests

Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained. A minimum of one field density test per lift of backfill for every ~~200~~ meters (feet) of installation shall be performed. One moisture density relationship shall be determined for every ~~1500 cubic meters~~ (1500 cubic yards) of material used. Field in-place density shall be determined in accordance with ~~[ASTM D 1556]~~ ~~[ASTM D 2167]~~ [ASTM D 2922]. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, at intervals as directed by the Contracting Officer. Copies of calibration curves, results of calibration tests, and field and laboratory density tests shall be furnished to the Contracting Officer. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Government.

3.4.4 Displacement of Sewers

NOTE: The trench should be backfilled to at least 600 mm (2 feet).

After other required tests have been performed and the trench backfill compacted to [] meters (feet) above the top of the pipe] [the finished grade surface], the pipe shall be inspected to determine whether significant displacement has occurred. This inspection shall be conducted in the presence of the Contracting Officer. Pipe sizes larger than 900 mm (36 inches) (36 inches) shall be entered and examined, while smaller diameter pipe shall be inspected by shining a light or laser between manholes or manhole locations, or by the use of television cameras passed through the pipe. If, in the judgement of the Contracting Officer, the interior of the pipe shows poor alignment or any other defects that would cause improper functioning of the system, the defects shall be remedied as directed at no additional cost to the Government.

3.5 UTILITY LOCATION

The Contractor shall be responsible for verifying the location of all utilities. The Contractor shall be responsible for contacting all utility companies and the property owner to confirm and identify all utilities. Any damage caused by the Contractor shall be repaired at no additional cost to the Government. The Contractor shall provide as-built drawings of all utilities encountered showing location and elevation and identifying the type of utility encountered.

-- End of Section --

SECTION 02228

FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 General

The work to be completed under this section includes removal of accumulated liquids and sediments in designated sections of the TNT Pipeline (and associated laterals and manholes), containment, collection and temporary storage of liquid and solid (sediment) wastes removed from the TNT Pipeline, disposal of liquid from the pipeline and all wastes generated during the work, and closure-in-place of intact TNT Pipeline Sections by grouting. Treatment/disposal of pipeline sediments and excavated soil containing explosive compounds exceeding the clean-up criteria shall be performed by the Contractor using a professional Explosives Expert (as defined in Section 01110: SAFETY, HEALTH, AND EMERGENCY RESPONSE) as necessary for potentially detonable materials. The Contractor is responsible for the dewatering, stabilization (if required), transportation, and disposal at a treatment/disposal facility (unless otherwise directed by the Contracting Officer) of sediments and contaminated soils. The Contractor shall furnish all labor, materials, equipment, and services necessary to complete the work required in the Specifications and as shown in the Drawings.

Included as Attachment 1 is a summary of results of previous investigations of the TNT Pipeline and test pit logs from the Pre-Design Investigation.

1.1.2 Health and Safety

All work shall be conducted in accordance with the Contractor's Site-Specific Health and Safety Plan.

1.1.3 Surface Preparation

Surface preparation and construction of erosion, runoff, and runoff controls to minimize surface water entering the excavation shall be performed prior to excavation work in each area in accordance with those subsections within Section 01561: ENVIRONMENTAL PROTECTION.

1.1.4 Excavation

Excavation of sumps and to access the pipeline due to blockages, laterals, breaks, etc.; liquids handling in excavations; dust control; soil stockpiling; and, backfilling of excavations shall be performed in accordance with Section 02229: EXCAVATION AND COMPLETE REMOVAL OF THE TNT PIPELINE.

1.1.5 Utilities

The Contractor shall locate all utilities within the excavation or staging areas prior to any excavation activities. If necessary, the Contractor shall relocate, either temporarily or permanently, as determined by the Contracting Officer, any utilities which cannot be adequately protected during excavation and staging activities or which prevent excavation activities from proceeding. The Contractor shall repair any damage caused to utilities by his activities at no additional cost to the Government.

1.1.6 Performance of Work

The Contractor shall perform all work in accordance with all federal, state, and local laws and/or requirements.

1.2 SUBMITTALS

1.2.1 Pipeline Flushing and Sediment/Liquids Handling Plan - TNT Pipeline

Thirty calendar days following the Notice to Proceed and prior to the Preconstruction Plan Review Conference, the Contractor shall submit for the Contracting Officer's review a Preliminary Pipeline Flushing and Sediment/Liquids Handling Plan (Pipeline Flushing Plan) as part of the **Site Operations Plan** for the work in this Section to be accomplished. The Pipeline Flushing Plan shall include the proposed sequence of operations; method for excavating sumps; method for excavating and storing of contaminated soil, clean and backfill soil; the type, rated capacity, and quantity of equipment to be used in the pipeline flushing operation; plans showing locations and configuration of proposed temporary stockpiles and equipment decontamination areas; method to main access roads leading out of the exclusion zone clean; maintaining clean vehicles during loading operations and exiting from site; the drainage and dewatering methods to control and remove surface water and groundwater flowing toward and tending to collect in excavations; methods for handling and dewatering sediments; and, methods for collecting, treating and recycling flush waters. If on-site stabilization will be used for soils/sludges/sediment prior to off-site disposal, the Plan shall provide the stabilization method, including reagent/mixture/recipe, mixing method and equipment, environmental controls, and performance testing. The Contractor shall incorporate all comments received from the Contracting Officer at the Preconstruction Plan Review Conference and submit a Final Pipeline Flushing Plan within 30 days after the conference. Pipeline flushing shall be performed in accordance with the approved Plan and, if the required results are not obtained, the Contractor shall revise his plans in writing before changing the work procedures.

1.2.2 Explosives Operations Plan

The Contractor shall provide an Explosives Operations Plan as part of his SSHP. If potentially explosive crystalline material is discovered at any time during operations, the Contractor shall immediately stop operations in the affected area, mark the location, notify onsite personnel of the potential explosive hazard and the area's restrictions, and notify the Contracting Officer. The Contractor's subcontracted Explosives Expert will make appropriate arrangements for evaluation and proper disposal of the crystalline material. The Contractor's Explosives Expert shall be responsible for the handling and transport of any crystalline/detonable material in a safe manner to the adjacent New York Army National Guard property as pre-arranged by the USACE. The Contractor's Explosives Expert shall then be responsible for the treatment and disposal of the crystalline material. The Explosives Operations Plan as part of the SSHP shall specifically address procedures to be followed, if known or potential explosive material ordnance, or other such items are encountered during any phase of field work. The Explosives Operations Plan shall be prepared by the Explosives Expert and include procedures for excavation of the TNT pipeline; and the handling, storage, transportation, treatment, and disposal of crystalline/detonable materials.

PART 2 PRODUCT

2.1 STAGING AREAS

2.1.1 Impermeable Barrier

The impermeable barrier shall consist of a 40-mil polyethylene geomembrane.

PART 3

EXECUTION

3.1 TNT PIPELINE FLUSHING

3.1.1 Equipment and Personnel

The Contractor shall provide all labor, materials, equipment and services for the following activities:

3.1.1.1 Locating TNT Pipeline

Field identification and marking of intact TNT pipeline segments and laterals to be flushed based upon previous site investigations and as shown in the Drawings. The Contractor shall perform all surveying as necessary for the performance of the work. Surveying to determine quantities shall be performed by an independent surveyor registered in the State of New York. The Contractor shall be responsible for laying out the centerline of the north and south TNT pipelines and laterals; providing a survey of the existing surface elevations (topographical survey of area, approximately 25 feet from pipeline centerline, to be excavated for pipeline access); performing any intermediate surveying as needed; performing final survey of excavated depths and dimensions for access points; and providing a final grade survey of backfilled areas.

The Contractor shall coordinate all survey work with the CO prior to and during work activities at the site. The Contractor shall notify the CO when the accessing of each pipeline has been completed and the bedding soil have been exposed. The Contractor's Surveyor will then survey the area to verify the depths excavated. Additional excavation based on confirmation sampling will be maintained by intermediate surveys until the CO notifies the Contractor that excavation is complete. The Contractor will then survey the areas for final excavated dimensions and depths prior to backfilling. All coordinate and elevation data shall be determined to the nearest 0.01 ft. Horizontal measurements shall be tied into the CWM facility coordinate system. All elevations will be referenced to the National Geodetic Vertical Datum of 1929.

3.1.1.2 Delineation of Excavation Areas

Delineation of areas to be excavated to access upgradient and downgradient points of each intact pipeline segment.

3.1.1.3 Erosion and Sedimentation Controls

Establishment and maintenance of erosion and sedimentation controls and stormwater management controls for all areas to be disturbed in accordance with the approved Contractor's Erosion and Sediment Control Plan.

3.1.1.4 Clearing and Grubbing

Clearing and grubbing, as necessary, of areas requiring excavation. Vegetation/debris shall be disposed of, by the Contractor, in accordance with Section 02110: CLEARING AND GRUBBING.

3.1.1.5 Excavation

The pipeline consists of vitreous clay pipe ranging in diameter from 10 to 18 inches. The clay pipes are concrete encased with approximate outside dimensions of 2 ft wide by 3 ft high. The concrete encasements do not appear to be reinforced based on observations during previous investigations.

Excavation at upgradient and downgradient segment locations to expose pipeline, and construction of temporary containment sumps to capture and contain pipeline liquids in accordance with the following procedures/requirements:

a. The Contractor shall power wash the pipeline in manageable intervals. The Contractor shall install a grout plug at a minimum interval of 250 ft in length. Access to the pipeline must be gained for removal of liquids and power washing operations. The Contractor shall uncover the pipeline at both ends of the interval by excavation of surrounding soils. The Contractor shall create a temporary lined sump for removal activities at the points the pipeline is uncovered. The sump shall be lined with a 40 mil minimum geomembrane to prevent the release of materials (primarily water) to the surrounding environment during removal and power washing activities.

b. Excavation activities for creation of the sumps shall follow the specification as presented in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES. The excavated soils removed during sump creation shall be staged for use as backfill on constructed lined soil stock pile areas. Confirmation sampling shall be performed by the Contractor to determine if concentrations are above cleanup criteria. The stockpiled soils shall be used as backfill material if below the soil clean-up criteria. If concentrations are above the criteria, the Contractor shall provide transport and treatment/disposal (unless otherwise directed by the Contracting Officer) of these materials. The transporting vehicles shall be loaded and operated in such a manner so as to prevent any spillage or loss of material.

c. The contractor shall plan and execute all excavation activities to minimize the disturbance of surrounding structures and pavements. Excavation of side slopes are the sole responsibility of the excavation Contractor. The working area slopes of the temporary sumps shall be cut inclinations in accordance with OSHA requirements of 20 CFR Part 1926 and EM 385-1-1 (September 1996) for safe working conditions. Cut slope inclinations in these instances must be designed by a qualified civil or geotechnical engineer. Sheet piling and shoring of excavation sidewalls, if needed to protect construction personnel or existing nearby structures (e.g., utilities or roadways), shall be designed and constructed and must conform to OSHA requirements. The stability of excavation side slopes and temporary retention systems, as well as the safety of project personnel working within the excavations, is the sole responsibility of the Contractor.

d. Excavated soils shall be handled and stockpiled in accordance with the procedures in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINE.

e. Surface water, stormwater, and all liquids which may flow towards, enter, and/or collect within the sumps shall be managed as specified in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF PIPELINES, Paragraph 3.2, Drainage and Dewatering.

3.1.1.6 Removal of TNT Pipeline Liquids

Removal of pipeline liquids, for containerization, sampling and analysis and appropriate disposal. After creation of the temporary sumps, the pipeline shall be accessed at the upgradient location if a pressure head due to the pipeline liquids is anticipated. The pipeline can be accessed at a downgradient location if an excessive pressure head does not exist. Excessive pressure was observed in the pipeline below Sta. 15+80. Existing manholes, where present, can be utilized to relieve the pressure head prior to accessing the pipeline. The liquids contained in the pipeline shall be removed from the accessed location to the extent possible and transferred into a temporary storage vessel (i.e., tanker truck or temporary tank), sampled, and analyzed to determine specific treatment/disposal requirements. Any liquid entering the sump will be pumped to a temporary storage tank for analysis. The liquids will be stored temporarily until the results of the analysis are available. All pipeline liquids shall be managed in accordance with Sections 02141: DEWATERING LIQUIDS AND HANDLING.

3.1.1.7 Video Inspection

Video inspection of the pipeline according to the following:

a. Following pipeline liquid removal and prior to sediment removal, the Contractor shall conduct a video inspection of the pipeline segment to identify any breaks, plugs, blockages, tie-ins, and/or crystalline materials. The Contractor shall provide a written report of findings, including a narrative summary and identification/location of each identified feature, and one (1) copy of the videotape, to the Contracting Officer.

b. Location where breaks, plugs or tie-ins are identified by the video inspection, shall be excavated to expose the pipeline. If possible, breaks or tie-ins may be sealed with grout to prevent migration of contaminants. Otherwise the break, tie-in or plug shall be access and used to establish a new containment sump/access point for flushing. At each breakage or tie-in where contaminant migration may have occurred, underlying soils shall be sampled to determine proper management. Soil sampling and analysis shall be in accordance with Section 02010: CONFIRMATION, VERIFICATION, AND POST-INTERIM REMOVAL ACTION SAMPLING.

c. If the remote video procedure identifies potential tie-ins or laterals, the Contractor shall first uncover the tie-in for inspection. Tie-ins to the TNT pipeline shall be surveyed and then grouted at the point of the tie-in. Laterals shall be closed in place as indicated on the drawings when the integrity of the pipeline allows for power washing without resulting in spills. The lateral shall be removed, following the procedures specified in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES, if the integrity of the pipeline is deemed unsuitable for power washing.

d. If crystalline material is observed in the video inspection, the Contractor shall notify the Explosives Expert. Removal and management of crystalline material shall proceed under the direction of the Explosives Expert, and in accordance with the approved Explosive Operations Plan as part of the Contractor's SSHP. Crystalline material shall be transported in a safe manner to the adjacent New York Army National Guard property as pre-arranged by the USACE and as directed by the CO. The Contractor's Explosives Expert shall then be responsible for safe treatment/destruction and disposal of the crystalline material.

3.1.1.8 Removal of TNT Pipeline Sediments

Removal of pipeline sediments from the pipeline segment, using a high pressure power nozzle system in accordance with the following procedures:

a. The Contractor shall power wash the TNT pipelines with a high-pressure jetting nozzle system. The power wash system shall be capable of effectively removing sediments from the pipeline and cleaning the inner surfaces of the pipe without causing damage to the pipeline. The power wash system shall also be capable of removing debris that may stop the forward travel of the wash system.

b. Access to the TNT pipeline for insertion of the power wash system shall be gained through the temporary sumps. These sumps shall be lined and used to collect the wash water and sediments as they are removed. Where possible, existing manholes may be used as access points and temporary sumps.

c. Removal of the pipeline sediments shall be conducted using a truck-mounted system with power washing and vacuum equipment. A hose with a high-pressure power washer nozzle shall be inserted into the downstream end of the exposed pipeline interval at the temporary sump. The power washer nozzle will be extended into the pipeline interval then withdrawn to flush loosened materials from the line. This method shall be followed until it reaches the upstream temporary sump.

d. The Contractor shall place the vacuum hose at the downgradient access point and pump water from the sump as it is generated from the power washing operation. The vacuum pump shall have a minimum pumping capacity of 125 gallons per minute. The vacuum hose shall pump sediment and water from the pipeline into a tank truck or a portable tank mounted on a truck. The water and solids shall then be pumped into an on-site tank to allow the solids to settle. Following this, the Contractor shall decant, and treat on-site in a treatment unit the flush water to allow for re-use of the water in

subsequent pipeline sections. The final wash water, or waters that can not be economically recycled, shall be sampled and analyzed to determine the proper disposal in accordance with Section 02141: DEWATERING LIQUIDS AND HANDLING. The sediments shall be assumed to contain explosives compounds. The Contractor's Explosives Expert shall determine whether detonable or potentially detonable materials are present. Detonable materials shall be segregated if possible, transported to the adjacent New York Army National Guard Property as pre-determined by the USACE and directed by the CO, and shall be treated/destroyed and/or disposed by the Contractor's Explosives Expert. Sediments determined to be free of detonable explosives shall be managed, and disposed by the Contractor.

e. Power washing equipment shall process 400 to 500 ft of pipe between access points. The Contractor may determine the most cost effective methods and distances between access points to effectively remove the contents of the pipeline. The Contractor is required, however, to create an effective plug with a bentonite/cement grout at a minimum interval of 250 ft.

f. Each pipeline segment shall be flushed once and then effective removal of the contents verified by pipeline video camera techniques prior to the Contractor sealing access points to prevent the backwash of the next pipeline section from entering the washed section. When an interval has been power washed and inspected by the video camera, the Contractor shall proceed with the next interval and continue the process until all TNT pipeline sections designated for closure in-place have been completed. Approval to grout the ends of the flushed section shall be provided by the CO or his/her designee based on the visual verification by video techniques, and completion of the Post-IRA wipe sampling as specified in Section 02010: CONFIRMATION, VERIFICATION, AND POST-IRA SAMPLING.

g. There may be roots, material plugs, or other obstructions in the lines to stop the progress of the power wash system. If this situation is encountered, the Contractor shall try to loosen the blockage by working the power wash system from both the sides of the blockage. If removal of the blockage is unsuccessful using the power washer system, these obstructions shall be handled by excavating and accessing the pipelines near the estimated stoppage location. The Contractor shall visually inspect the blockage and remove the materials.

3.1.1.9 Sealing the TNT Pipeline

Grouting the ends of the power wash interval and closure of the temporary sumps in accordance with the following procedures:

a. When power washing of the pipeline interval or lateral has been completed, and the video inspection and Post-IRA samples collected, the Contractor shall seal the pipeline at both ends with a minimum of 5 ft in pipe length of a 18:1 (by weight) cement bentonite mixture. A seepage collar composed of bentonite pellets that surround the pipeline and extend at least 1 foot beyond the plugged shall be constructed prior to backfilling the sump location. Manholes encountered in sections to be closed in-place shall be filled with the same cement bentonite mixture and the lid (if present) sealed shut.

b. The upgradient temporary sump shall be closed prior to proceeding with the next interval. The downgradient temporary sump shall be closed if not used as a temporary sump for power washing the next pipeline interval. Sump closure shall include first removal of the sump liner and then testing of the underlying soils. A TNT field test kit shall be used to initially determine if the soil cleanup criteria have been exceeded. Based on these results or evidence of spills/staining, etc., a 6-inch lift of soils shall be removed. Sampling of the remaining sump soils and analysis using field test kits shall be continued until the results indicate cleanup criteria as presented in Section 02010: CONFIRMATION, VERIFICATION, AND POST-IRA SAMPLING are met. Soil removed from below the temporary sump liner due to TNT field test results or leakage of the liner/spills shall be staged, sampled, and analyzed to determine its characteristics. At a depth the field test kit results indicate that the soil

cleanup criteria are met, final confirmation sampling shall be completed to verify the field test results. The temporary sump(s) shall be backfilled when the final confirmation results verify that the concentrations are below the cleanup criteria.

c. The Contractor is responsible for developing an approved Site-Specific Health and Safety Plan (SSHP) and a Contingency Plan for release of material prior to removing material from the TNT pipeline system. The Contractor is responsible for remediation of spills, including excavation and disposal of impacted soil as a result of the Contractor's activities at no cost to the Government.

3.1.1.10 Backfilling

Backfill of all excavations with clean soil as provided in Section 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS of the Specifications.

3.1.1.11 Restoration

Restoration of all disturbed areas to preexisting conditions including as appropriate rough and final grading, topsoil/seeding/mulching and/or repair/replacement of paved areas in accordance with the specifications.

3.2 HANDLING AND TRANSPORTING PIPELINE SEDIMENTS

3.2.1 Containerization and Transport

The Contractor is responsible for the containerization and transport of all sediments removed from the pipeline and excavated soils containing explosive compounds that exceed the clean-up criteria to a designated treatment/disposal facility. Sediments removed from the pipeline by power washing will be initially in the form of a slurry. The slurry shall be contained and stored to allow the sediment to settle out and the liquids to be decanted, for recycling as wash fluid or transported for treatment/disposal. The Contractor shall provide for transport to and disposal at an approved permitted facility for soils and sediment which exceed cleanup criteria. Detonable materials shall be managed by the Contractor's Explosives Expert. The Contractor shall determine disposal methods for other soils and sediments. Pretreatment of soils by stabilization to meet disposal criteria may be performed at the disposal facility or on-site by the Contractor.

The Contractor shall coordinate disposal truck traffic to and from the remediation area to ensure easy flow of traffic through the site that will not interfere with site activities and CWM's RCRA TSDF facility operation. The Contractor is responsible for the construction, maintenance and ultimate removal of temporary construction access roads. The Contractor is responsible for maintaining access road, within the exclusion zone to be used by off-site transport vehicle, clear of known or potentially contaminated vehicles. Restricted traffic and temporary lines shall be used to maintain these access roads clean. Construction exits shall be maintained to keep the site access roads free of soils and sediments.

-- End of Section --

ATTACHMENT 1

TNT PIPELINE RESULTS AND LOGS

Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-0000N		PRT-SD-0000S		PRT-SD-0150N		PRT-SD-0150S		<i>PRT-SD-1555N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	11000	U	54000	U	2100	U	2100	U	2000	U
RDX	4900	U	25000	U	970	U	940	U	930	U
1,3,5-Trinitrobenzene	1200	U	6200	U	240	U	240	U	230	U
1,3-Dinitrobenzene	1200	U	62000	U	240	U	230	U	230	U
Nitrobenzene	1300	U	64000	U	250	U	240	U	240	U
Tetryl	3600	U	190000	U	730	U	700	U	690	U
Amino-DNTs	47000		120000	U	4400		470	U	580	
2,4,6-Trinitrotoluene	180000	DL	1000000	DL	36000	DL	240	U	230	U
2,6-Dinitrotoluene	1300	U	64000	U	250	U	240	U	240	U
2,4-Dinitrotoluene	1200	U	62000		240	U	230	U	230	U
Total Concentration	239850		1354600		42910		2815		3090	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg

Parameter	<i>PRT-SD-1555S</i>		PRT-SD-1563N		PRT-SD-1563S		<i>PRT-SD-1583N</i>		<i>PRT-SD-1583S</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2000	U	2100	U	2100	U	1700	U	1900	U
RDX	910	U	970	U	970	U	780	U	850	U
1,3,5-Trinitrobenzene	230	U	240	U	240	U	200	U	210	U
1,3-Dinitrobenzene	230	U	240	U	240	U	190	U	210	U
Nitrobenzene	240	U	250	U	250	U	200	U	220	U
Tetryl	680	U	730	U	730	U	580	U	640	U
Amino-DNTs	460	U	490	U	490	U	390	U	430	U
2,4,6-Trinitrotoluene	230	U	240	U	240	U	200	U	210	U
2,6-Dinitrotoluene	240	U	250	U	250	U	200	U	220	U
2,4-Dinitrotoluene	230	U	240	U	240	U	190	U	210	U
Total Concentration	2725		2875		2875		2315		2550	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg

Parameter	<i>PRT-SD-1600N</i>		<i>PRT-SD-1600S</i>		PRT-SD-1608N		PRT-SD-1608S		<i>PRT-SD-1618N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2200	U	2200	U	2200	U	2200	U	2100	U
RDX	1000	U	1000	U	990	U	990	U	690	U
1,3,5-Trinitrobenzene	250	U	250	U	250	U	250	U	240	U
1,3-Dinitrobenzene	250	U	250	U	250	U	250	U	240	U
Nitrobenzene	260	U	260	U	260	U	260	U	250	U
Tetryl	750	U	750	U	740	U	740	U	720	U
Amino-DNTs	500	U	500	U	490	U	7800		480	U
2,4,6-Trinitrotoluene	250	U	250	U	250	U	1300		540	
2,6-Dinitrotoluene	260	U	260	U	260	U	260	U	250	U
2,4-Dinitrotoluene	250	U	250	U	250	U	250	U	240	U
Total Concentration	2985		2985		2970		11700		3145	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

**Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg**

Parameter	<i>PRT-SD-1618S</i>		PRT-SD-1665N		<i>PRT-SD-1671N</i>		<i>PRT-SD-1690N</i>		<i>PRT-SD-1900N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2200	U	2200	U	2100	U	2000	U	1800	U
RDX	990	U	990	U	970	U	920	U	820	U
1,3,5-Trinitrobenzene	250	U	250	U	240	U	230	U	210	U
1,3-Dinitrobenzene	250	U	250	U	240	U	230	U	200	U
Nitrobenzene	260	U	260	U	250	U	240	U	210	U
Tetryl	740	U	740	U	720	U	690	U	610	U
Amino-DNTs	3000		490	U	480	U	460	U	410	U
2,4,6-Trinitrotoluene	390		660		240	U	250		430	
2,6-Dinitrotoluene	260	U	260	U	250	U	240	U	210	U
2,4-Dinitrotoluene	250	U	250	U	240	U	230	U	200	U
Total Concentration	5990		3505		2865		2870		2765	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

**Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg**

Parameter	PRT-SD-2007S		PRT-SD-2150N		<i>PRT-SD-2150S</i>		<i>PRT-SD-2150S-DUP</i>		<i>PRT-SD-2400N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2200	U	3600	U	1900	U	1700	U	1800000	U
RDX	990	U	1600	U	850	U	770	U	820000	U
1,3,5-Trinitrobenzene	250	U	410	U	210	U	190	U	210000	U
1,3-Dinitrobenzene	250	U	410	U	210	U	190	U	200000	U
Nitrobenzene	260	U	420	U	220	U	200	U	210000	U
Tetryl	740	U	1200	U	640	U	570	U	610000	U
Amino-DNTs	490	U	15000		430	U	380	U	410000	U
2,4,6-Trinitrotoluene	250	U	6500		210	U	190	U	84000000	DL
2,6-Dinitrotoluene	260	U	420	U	220	U	200	U	210000	U
2,4-Dinitrotoluene	250	U	410	U	210	U	190	U	200000	U
Total Concentration	2970		25735		2550		2290		86335000	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

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Bold and italics indicates resamples from 3/97.

**Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg**

Parameter	<i>PRT-SD-2400S</i>		PRT-SD-2425N		PRT-SD-2425S		PRT-SD-2425S DUP		<i>PRT-SD-2430N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	8900	U	2100	U	2100	U	2100	U	110000	U
RDX	4100	U	950	U	950	U	950	U	49000	U
1,3,5-Trinitrobenzene	1000	U	4500		240	U	240	U	8900	
1,3-Dinitrobenzene	1000	U	2100		240	U	240	U	12000	U
Nitrobenzene	1100	U	250	U	250	U	250	U	13000	U
Tetryl	3000	U	710	U	710	U	710	U	37000	U
Amino-DNTs	46000	DL	470	U	470	U	480	U	150000	
2,4,6-Trinitrotoluene	170000	DL	2700000	DL	240	U	240	U	21000000	
2,6-Dinitrotoluene	1100	U	250	U	250	U	250	U	13000	U
2,4-Dinitrotoluene	1200		1900		240	U	240	U	12000	U
Total Concentration	227300		2710865		2845		2850		21281900	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

**Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg**

Parameter	<i>PRT-SD-2430S</i>		<i>PRT-SD-2430S DUP</i>		<i>PRT-SD-3080N</i>		PRT-SD-3080N		<i>PRT-SD-3080N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2200	U	2200	U	1900	U	2200	U	2200	U
RDX	990	U	1000	U	880	U	980	U	990	U
1,3,5-Trinitrobenzene	250	U	250	U	220	U	250	U	250	U
1,3-Dinitrobenzene	250	U	250	U	220	U	250	U	250	U
Nitrobenzene	260	U	260	U	230	U	250	U	260	U
Tetryl	740	U	750	U	660	U	740	U	740	U
Amino-DNTs	500	U	500	U	440	U	490	U	500	U
2,4,6-Trinitrotoluene	290		250	U	220	U	250	U	250	U
2,6-Dinitrotoluene	260	U	260	U	230	U	250	U	260	U
2,4-Dinitrotoluene	250	U	250	U	220	U	250	U	250	U
Total Concentration	3140		2985		2610		2955		2975	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

**Summary of Analytical Results for the PRDI for Explosives in Sediment
Concentrations in ug/kg**

Parameter	<i>PRT-SD-3080S</i>		PRT-SD-3080S		<i>PRT-SD-3080S</i>		<i>PRL-SD-OIL-W</i>		PRL-SD-A22	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	9900		2200	U	2100	U	1800	U	2000	U
RDX	4500	U	990	U	970	U	840	U	900	U
1,3,5-Trinitrobenzene	1100	U	250	U	240	U	210	U	230	U
1,3-Dinitrobenzene	1100	U	250	U	240	U	210	U	230	U
Nitrobenzene	1200	U	260	U	250	U	220	U	240	U
Tetryl	3400	U	740	U	720	U	630	U	680	U
Amino-DNTs	2200	U	490	U	590		420	U	450	U
2,4,6-Trinitrotoluene	1100	U	270		240	U	210	U	1200	
2,6-Dinitrotoluene	1200	U	260	U	250	U	220	U	240	U
2,4-Dinitrotoluene	1100	U	250	U	240	U	210	U	230	U
Total Concentration	18350		3115		3215		2485		3800	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Soil
Concentrations in ug/kg

Parameter	PRT-SL-0000N		PRT-SL-0000S		PRT-SL-0150N		PRT-SL-0150S		PRT-SL-1583N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	1900	U	2200	U	1900	U	1900	U	2100	U
RDX	880	U	1000	U	850	U	860	U	940	U
1,3,5-Trinitrobenzene	1700		250	U	210	U	220	U	240	U
1,3-Dinitrobenzene	220	U	250	U	210	U	220	U	230	U
Nitrobenzene	230	U	260	U	220	U	220	U	240	U
Tetryl	660	U	750	U	640	U	650	U	700	U
Amino-DNTs	2500		500	U	420	U	430	U	470	U
2,4,6-Trinitrotoluene	11000	DL	250	U	390		220	U	240	U
2,6-Dinitrotoluene	230	U	260	U	220	U	220	U	240	U
2,4-Dinitrotoluene	220	U	250	U	210	U	220	U	230	U
Total Concentration	17370		2985		2830		2580		2815	

Note:

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Summary of Analytical Results for the PRDI for Explosives in Soil
Concentrations in ug/kg

Parameter	PRT-SL-1583S		PRT-SL-1700N		PRT-SL-1700S		PRT-SL-1900N		PRT-SL-1900S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2000	U	2000	U	2200	U	2000	U	1900	U
RDX	910	U	920	U	980	U	920	U	860	U
1,3,5-Trinitrobenzene	230	U	230	U	250	U	230	U	220	U
1,3-Dinitrobenzene	230	U	230	U	250	U	230	U	210	U
Nitrobenzene	240	U	240	U	250	U	240	U	220	U
Tetryl	680	U	690	U	740	U	690	U	640	U
Amino-DNTs	450	U	460	U	490	U	460	U	430	U
2,4,6-Trinitrotoluene	230	U	230	U	250	U	230	U	220	U
2,6-Dinitrotoluene	240	U	240	U	250	U	240	U	220	U
2,4-Dinitrotoluene	230	U	230	U	250	U	230	U	210	U
Total Concentration	2720		2735		2955		2735		2565	

Note:

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Summary of Analytical Results for the PRDI for Explosives in Soil
Concentrations in ug/kg

Parameter	PRT-SL-2007S		PRT-SL-2007S (Dup)		PRT-SL-2150N		PRT-SL-2150S		PRT-SL-2150S-DUP	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2100	U	2100	U	2000	U	2200	U	2000	U
RDX	970	U	930	U	910	U	1000	U	910	U
1,3,5-Trinitrobenzene	240	U	240	U	230	U	250	U	230	U
1,3-Dinitrobenzene	240	U	230	U	230	U	250	U	230	U
Nitrobenzene	250	U	240	U	240	U	260	U	240	U
Tetryl	730	U	700	U	680	U	750	U	680	U
Amino-DNTs	490	U	470	U	1100		500	U	450	U
2,4,6-Trinitrotoluene	240	U	240	U	3200		250	U	230	U
2,6-Dinitrotoluene	250	U	240	U	240	U	260	U	240	U
2,4-Dinitrotoluene	240	U	230	U	230	U	250	U	230	U
Total Concentration	2875		2810		6680		2985		2720	

Note:

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Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Soil
Concentrations in ug/kg

Parameter	<i>PRT-SL-2400N</i>		<i>PRT-SL-2400S</i>		PRT-SL-3130N		PRT-SL-3130S		<i>PRT-SL-3150N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	2100	U	2000	U	2200	U	2100	U	2100	U
RDX	980	U	930	U	990	U	940	U	930	U
1,3,5-Trinitrobenzene	250	U	230	U	250	U	240	U	240	U
1,3-Dinitrobenzene	240	U	230	U	250	U	230	U	230	U
Nitrobenzene	250	U	240	U	260	U	240	U	240	U
Tetryl	730	U	690	U	740	U	700	U	700	U
Amino-DNTs	490	U	460	U	500	U	470	U	470	U
2,4,6-Trinitrotoluene	250	U	230	U	250	U	240	U	240	U
2,6-Dinitrotoluene	250	U	240	U	260	U	240	U	240	U
2,4-Dinitrotoluene	240	U	230	U	250	U	230	U	230	U
Total Concentration	2890		2740		2975		2815		2810	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Soil
Concentrations in ug/kg

Parameter	<i>PRT-SL-3150S</i>		<i>PRT-SL-3160N</i>		<i>PRT-SL-3160S</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	1800	U	2100	U	2200	U
RDX	800	U	940	U	990	U
1,3,5-Trinitrobenzene	200	U	240	U	250	U
1,3-Dinitrobenzene	200	U	240	U	250	U
Nitrobenzene	210	U	250	U	260	U
Tetryl	600	U	710	U	740	U
Amino-DNTs	400	U	6400		14000	
2,4,6-Trinitrotoluene	200	U	1400		1500	
2,6-Dinitrotoluene	210	U	250	U	260	U
2,4-Dinitrotoluene	200	U	240	U	250	U
Total Concentration	2410		10285		18100	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L

Parameter	PRT-WT-0000		PRT-WT-0000S		PRT-WT-0150N		PRT-WT-0150S		<i>PRT-WT-1583N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	340	U	860	U	1700	U	86	U	1.7	U
RDX	160	U	390	U	780	U	39	U	0.78	U
1,3,5-Trinitrobenzene	300		98	U	200	U	9.8	U	0.2	U
1,3-Dinitrobenzene	39	U	98	U	200	U	9.8	U	0.2	U
Nitrobenzene	41	U	100	U	200	U	10	U	0.2	U
Tetryl	120	U	290	U	580	U	29	U	0.58	U
Amino-DNTs	2200		1100		1300		120		0.39	U
2,4,6-Trinitrotoluene	9300	DL	21000	DL	130000	DL	1700	DL	0.2	U
2,6-Dinitrotoluene	41	U	100	U	200	U	10	U	0.2	U
2,4-Dinitrotoluene	39	U	98	U	200	U	9.8	U	0.2	U
Total Concentration	12190		23117		133330		1921.7		2.325	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L

Parameter	PRT-WT-1583S		<i>PRT-WT-1700N</i>		<i>PRT-WT-1700S</i>		<i>PRT-WT-1900</i>		<i>PRT-WT-1900N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U
RDX	0.78	U	0.78	U	0.78	U	0.78	U	0.78	U
1,3,5-Trinitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dinitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Nitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Tetryl	0.58	U	0.58	U	0.58	U	0.58	U	0.58	U
Amino-DNTs	0.39	U	0.39	U	1.6		0.39	U	0.39	U
2,4,6-Trinitrotoluene	0.2	U	0.2	U	0.2	U	0.2	U	0.25	
2,6-Dinitrotoluene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2,4-Dinitrotoluene	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Total Concentration	2.325		2.325		3.73		2.325		2.475	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L

Parameter	<i>PRT-WT-1900S</i>		PRT-WT-1910N		PRT-WT-1910S		PRT-WT-2007S		<i>PRT-WT-2150N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	1.7	U	1.7	U	1.7	U	1.7	U	86	U
RDX	0.78	U	0.78	U	0.78	U	0.78	U	39	U
1,3,5-Trinitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	9.8	U
1,3-Dinitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	9.8	U
Nitrobenzene	0.2	U	0.2	U	0.2	U	0.2	U	10	U
Tetryl	0.58	U	0.58	U	0.58	U	0.58	U	29	U
Amino-DNTs	0.39	U	0.39	U	0.39	U	7.1		440	
2,4,6-Trinitrotoluene	0.2	U	0.2	U	0.2	U	5.6		2200	DL
2,6-Dinitrotoluene	0.2	U	0.2	U	0.2	U	0.2	U	10	U
2,4-Dinitrotoluene	0.2	U	0.2	U	0.2	U	0.2	U	9.8	U
Total Concentration	2.325		2.325		2.325		14.73		2741.7	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L

Parameter	<i>PRT-WT-2150S</i>		<i>PRT-WT-2150S-DUP</i>		<i>PRT-WT-2400N</i>		<i>PRT-WT-2400S</i>		PRT-WT-2425N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMx	17	U	1.7	U	17	U	1.7	U	1.7	U
RDX	7.8	U	0.78	U	7.8	U	0.78	U	0.78	U
1,3,5-Trinitrobenzene	2	U	0.2	U	2	U	0.2	U	0.2	U
1,3-Dinitrobenzene	2	U	0.2	U	2	U	0.2	U	0.2	U
Nitrobenzene	2	U	0.2	U	2	U	0.8		0.2	U
Tetryl	5.8	U	0.58	U	5.8	U	0.58	U	0.58	U
Amino-DNTs	40		2		260	DL	0.39	U	260	DL
2,4,6-Trinitrotoluene	310	DL	11	DL	8.8		0.2	U	110	DL
2,6-Dinitrotoluene	2	U	0.2	U	2	U	0.2	U	0.2	U
2,4-Dinitrotoluene	2	U	0.2	U	2	U	0.2	U	0.2	U
Total Concentration	370.3		15.03		289.1		3.025		372.03	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L

Parameter	PRT-WT-2425N (Dup)		PRT-WT-2425S		<i>PRT-WT-2500</i>		<i>PRT-WT-3150N</i>		<i>PRT-WT-3150S</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
HMX	1.7	U	1.7	U	8.6	U	1.7	U	8.6	U
RDX	0.78	U	0.78	U	3.9	U	0.78	U	3.9	U
1,3,5-Trinitrobenzene	0.2	U	0.2	U	0.98	U	0.2	U	0.98	U
1,3-Dinitrobenzene	0.2	U	0.2	U	0.98	U	0.2	U	0.98	U
Nitrobenzene	0.2	U	0.2	U	1	U	0.2	U	1	U
Tetryl	0.58	U	0.58	U	2.9	U	0.58	U	2.9	U
Amino-DNTs	220	DL	0.39	U	2	U	9		2	U
2,4,6-Trinitrotoluene	95	DL	0.2	U	0.98	U	4		0.98	U
2,6-Dinitrotoluene	0.2	U	0.2	U	1	U	0.2	U	1	U
2,4-Dinitrotoluene	0.2	U	0.2	U	0.98	U	0.2	U	0.98	U
Total Concentration	317.03		2.325		11.66		15.03		11.66	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

**Summary of Analytical Results for the PRDI for Explosives in Water
Concentrations in ug/L**

Parameter	<i>PRL-WT-OIL-W</i>		<i>PRL-WT-A22</i>	
	Value	Qualifier	Value	Qualifier
HMX	1.7	U	1.7	U
RDX	0.78	U	0.78	U
1,3,5-Trinitrobenzene	0.2	U	0.2	U
1,3-Dinitrobenzene	0.2	U	0.2	U
Nitrobenzene	0.2	U	0.2	U
Tetryl	0.58	U	0.58	U
Amino-DNTs	0.39	U	0.39	U
2,4,6-Trinitrotoluene	0.2	U	0.2	U
2,6-Dinitrotoluene	0.2	U	0.26	
2,4-Dinitrotoluene	0.2	U	0.2	U
Total Concentration	2.325		2.485	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	PRT-SD-0000N		PRT-SD-0000S		PRT-SD-0150N		PRT-SD-0150S		PRT-SD-1563N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Methylene Chloride	14	B	8	B	52	B	12	B	13	B
Acetone	12	JB			1700	DL	50	B	16	BJ
Carbon Disulfide										
1,1-Dichloroethane			5	J			3	J		
1,2-Dichloroethene (total)										
Chloroform			2	J						
2-Butanone										
Trichloroethene									3	J
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene							1	J		
Ethylbenze										
Xylene (total)										
Total Concentration	26		15		1752		66		32	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	PRT-SD-1563S		<i>PRT-SD-1583N</i>		<i>PRT-SD-1583S</i>		PRT-SD-1608N		PRT-SD-1608S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Methylene Chloride	19	B	10	B	29	B	10	B	26	B
Acetone	110	B			120	B	5	BJ	46	B
Carbon Disulfide					11	J				
1,1-Dichloroethane										
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone					20	J				
Trichloroethene							3	J		
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Xylene (total)										
Total Concentration	129		10		180		18		72	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	<i>PRT-SD-1618N</i>		<i>PRT-SD-1618S</i>		PRT-SD-1665N		<i>PRT-SD-1690N</i>		<i>PRT-SD-1900N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Methylene Chloride	7	B	32	B	5	BJ	11	B	10	B
Acetone			480	B	50	B	220	B		
Carbon Disulfide										
1,1-Dichloroethane										
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone			41				15	J		
Trichloroethene										
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenze										
Xylene (total)										
Total Concentration	7		553		55		246		10	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	PRT-SD-2007S		PRT-SD-2150N		PRT-SD-2150S		PRT-SD-2150S-DUP		PRT-SD-2400N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride					19		9	J		
Methylene Chloride	11	B	10	B	13	B	9	B	16	B
Acetone			52	B	150	B	79	B	34	B
Carbon Disulfide							4	J		
1,1-Dichloroethane	2	J								
1,2-Dichloroethene (total)	5	J	12		41		20			
Chloroform										
2-Butanone					37		24			
Trichloroethene	3	J	170		23		10			
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene	2	J	3	J						
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenze										
Xylene (total)					3	J			3	J
Total Concentration	23		247		286		155		53	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	<i>PRT-SD-2400S</i>		PRT-SD-2425N		PRT-SD-2425S		PRT-SD-2425S (Dup)		<i>PRT-SD-3080N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Methylene Chloride	23	B	9	B	8	B	8	B	8	B
Acetone	140	B	51	B	19	B	22	B	85	B
Carbon Disulfide					20		17		3	J
1,1-Dichloroethane										
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone	32								26	
Trichloroethene										
1,1,2-Trichloroethane										
Benzene									7	J
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene			2	J						
Chlorobenzene										
Ethylbenze									8	J
Xylene (total)										
Total Concentration	195		62		47		47		137	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	PRT-SD-3080N		PRT-SD-3080S		PRT-SD-3080S		PRT-SD-3080S		PRL-SD-OIL-W	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride							10000	J		
Methylene Chloride	8	B	180000	JB	36000	B	23000	BJ	29	B
Acetone	97	B							190	B
Carbon Disulfide	33								19	J
1,1-Dichloroethane										
1,2-Dichloroethene (total)							35000			
Chloroform										
2-Butanone	16								39	J
Trichloroethene							7600	J		
1,1,2-Trichloroethane										
Benzene	9		770000		60000		510000			
4-Methyl-2-pentanone			420000	J						
Tetrachloroethene			190000	J	13000	J	74000			
1,1,2,2-Tetrachloroethane										
Toluene			670000		59000		460000		29	
Chlorobenzene										
Ethylbenze			3600000		360000		2100000			
Xylene (total)			14000000		1400000		6600000		9	J
Total Concentration	163		19830000		1928000		9819600		315	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Results for the PRDI for Volatiles in Sediments
Concentrations in ug/kg

Parameter	PRL-SD-A22	
	Value	Qualifier
Vinyl Chloride		
Methylene Chloride	74000	BJ
Acetone		
Carbon Disulfide		
1,1-Dichloroethane		
1,2-Dichloroethene (total)		
Chloroform	35000	J
2-Butanone		
Trichloroethene	140000	
1,1,2-Trichloroethane	95000	J
Benzene		
4-Methyl-2-pentanone		
Tetrachloroethene	330000	
1,1,2,2-Tetrachloroethane	240000	
Toluene	3700000	
Chlorobenzene		
Ethylbenze	1300000	
Xylene (total)	8400000	
Total Concentration	14314000	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples from 12/96.

Bold and italics indicates resamples from 3/97.

Summary of Analytical Data for the PRDI for Volatiles in Soil
Concentrations in ug/kg

Parameter	PRT-SL-0000N		PRT-SL-0000S		PRT-SL-0150N		PRT-SL-0150S		PRT-SL-1583N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Methylene Chloride	13	B	12	B	9	B	18	B	13	B
Acetone	13	B					8	JB		
1,2-Dichloroethene (total)										
Chloroform			11							
2-Butanone										
1,1,1-Trichloroethane										
Carbon Tetrachloride			3	J						
Trichloroethene							5	J		
Benzene							26			
4-Methyl-2-pentanone										
2-Hexanone										
Tetrachloroethene			2	J			5	J		
Toluene			2	J	1	J				
Ethylbenze							4	J		
Xylene (total)	2	J	4	J	2	J	21			
Total Concentration	28		34		12		87		13	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Data for the PRDI for Volatiles in Soil
Concentrations in ug/kg

Parameter	PRT-SL-1583S		PRT-SL-1700N		PRT-SL-1700S		PRT-SL-1900N		PRT-SL-1900S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Methylene Chloride	10	B	7	B	10	B	6	JB	5	JB
Acetone					9	JB				
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone										
1,1,1-Trichloroethane										
Carbon Tetrachloride										
Trichloroethene										
Benzene										
4-Methyl-2-pentanone										
2-Hexanone										
Tetrachloroethene										
Toluene										
Ethylbenze										
Xylene (total)	2	J	1	J						
Total Concentration	12		8		19		6		5	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Data for the PRDI for Volatiles in Soil
Concentrations in ug/kg

Parameter	PRT-SL-2007S		PRT-SL-2007S (Dup)		PRT-SL-2150N		PRT-SL-2150S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Methylene Chloride	18	B	21	B	11	B	14	B
Acetone	8	JB	6	BJ			12	BJ
1,2-Dichloroethene (total)	3	J	3	J			21	
Chloroform								
2-Butanone					7	J		
1,1,1-Trichloroethane					2	J		
Carbon Tetrachloride								
Trichloroethene	3	J	3	J	3	J	110	
Benzene								
4-Methyl-2-pentanone					2	J		
2-Hexanone					4	J		
Tetrachloroethene								
Toluene								
Ethylbenze								
Xylene (total)								
Total Concentration	32		33		29		157	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Data for the PRDI for Volatiles in Soil
Concentrations in ug/kg

Parameter	<i>PRT-SL-2150S DUP</i>		<i>PRT-SL-2400N</i>		<i>PRT-SL-2400S</i>		PRT-SL-3130N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Methylene Chloride	11	B	12	B	11	B	9	B
Acetone	8	BJ					12	B
1,2-Dichloroethene (total)	17							
Chloroform								
2-Butanone								
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Trichloroethene	99							
Benzene					15			
4-Methyl-2-pentanone								
2-Hexanone								
Tetrachloroethene								
Toluene							2	J
Ethylbenze					3	J		
Xylene (total)							3	J
Total Concentration	135		12		29		26	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Data for the PRDI for Volatiles in Soil
Concentrations in ug/kg

Parameter	PRT-SL-3130S		PRT-SL-3150N		PRT-SL-3150S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier
Methylene Chloride	9	B	16	B	12	B
Acetone			12	B	12	B
1,2-Dichloroethene (total)						
Chloroform						
2-Butanone						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Trichloroethene						
Benzene						
4-Methyl-2-pentanone						
2-Hexanone						
Tetrachloroethene						
Toluene						
Ethylbenze						
Xylene (total)						
Total Concentration	9		28		24	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.

Parameter	PRT-WT-0000		PRT-WT-0000S		PRT-WT-0150N		PRT-WT-0150S		PRT-WT-1583N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride	5	B								
Chloroethane	9	JB								
Methylene Chloride			1	BJ					1	JB
Acetone			9	BJ			34		4	JB
Carbon Disulfide										
1,1-Dichloroethene										
1,1-Dichloroethane			67				240	DL		
1,2-Dichloroethene (total)			1	J						
Chloroform			2	J						
1,2-Dichloroethane										
1,1,1-Trichloroethane										
Trichloroethene			2	J						
1,1,2-Trichloroethane										
Benzene			3	J			25			
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene							3	J		
Chlorobenzene			1	J			16			
Ethylbenzene							8			
Xylene (total)							10			
Total Concentration	14		86		0		336		5	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.

Parameter	PRT-WT-1583S		PRT-WT-1700N		PRT-WT-1700S		PRT-WT-1900		PRT-WT-1900N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Chloroethane										
Methylene Chloride			1	JB	1	JB	4	JB	7	B
Acetone			5	JB	5	JB	13	B		
Carbon Disulfide										
1,1-Dichloroethene										
1,1-Dichloroethane										
1,2-Dichloroethene (total)							27			
Chloroform										
1,2-Dichloroethane										
1,1,1-Trichloroethane										
Trichloroethene							6			
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Xylene (total)										
Total Concentration	0		6		6		50		7	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.

Parameter	<i>PRT-WT-1900S</i>		PRT-WT-1910N		PRT-WT-1910S		PRT-WT-2007S		<i>PRT-WT-2150N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride										
Chloroethane										
Methylene Chloride	6	B	5	JB	2	JB	2	JB	1	BJ
Acetone					4	JB			3	BJ
Carbon Disulfide										
1,1-Dichloroethene										
1,1-Dichloroethane							4	J		
1,2-Dichloroethene (total)			2	J	4	J	8		7	
Chloroform										
1,2-Dichloroethane										
1,1,1-Trichloroethane										
Trichloroethene					1	J	2	J	20	
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene					17					
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Xylene (total)										
Total Concentration	6		7		28		16		31	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

**Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.**

Parameter	<i>PRT-WT-2150S</i>		<i>PRT-WT-2150S-DUP</i>		<i>PRT-WT-2400N</i>		<i>PRT-WT-2400S</i>		PRT-WT-2425N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride	69		63							
Chloroethane										
Methylene Chloride	5	B			6	B	6	B	4	BJ
Acetone									13	B
Carbon Disulfide							19		7	B
1,1-Dichloroethene	2	J								
1,1-Dichloroethane										
1,2-Dichloroethene (total)	220	DL	190				2	J	2	J
Chloroform										
1,2-Dichloroethane										
1,1,1-Trichloroethane										
Trichloroethene	17		16							
1,1,2-Trichloroethane										
Benzene										
4-Methyl-2-pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene										
Chlorobenzene										
Ethylbenzene										
Xylene (total)										
Total Concentration	313		269		6		27		26	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.

Parameter	PRT-WT-2425N (Dup)		PRT-WT-2425S		PRT-WT-2500		PRT-WT-3150N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride	2	J						
Chloroethane								
Methylene Chloride	5	B	4	BJ	3	J	1	BJ
Acetone	16	B	18	B				
Carbon Disulfide							2	J
1,1-Dichloroethene								
1,1-Dichloroethane								
1,2-Dichloroethene (total)	2	J			4	J		
Chloroform								
1,2-Dichloroethane								
1,1,1-Trichloroethane								
Trichloroethene					3	J		
1,1,2-Trichloroethane								
Benzene					100		2	J
4-Methyl-2-pentanone								
Tetrachloroethene					7			
1,1,2,2-Tetrachloroethane								
Toluene					66			
Chlorobenzene								
Ethylbenzene					670	DL		
Xylene (total)					1600	DL		
Total Concentration	25		22		2453		5	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Volatiles in Water
Concentrations in ug/L.

Parameter	<i>PRT-WT-3150S</i>		<i>PRL-WT-OIL-W</i>		<i>PRL-WT-A22</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier
Vinyl Chloride	240				160	
Chloroethane						
Methylene Chloride	44	BJ	6	B	19	B
Acetone	48	BJ			17	B
Carbon Disulfide					37	
1,1-Dichloroethene					79	
1,1-Dichloroethane					14	
1,2-Dichloroethene (total)	380				180	
Chloroform					200	
1,2-Dichloroethane					2	J
1,1,1-Trichloroethane					19	
Trichloroethene					150	
1,1,2-Trichloroethane					92	
Benzene	440				29	
4-Methyl-2-pentanone					5	J
Tetrachloroethene	23	J			73	
1,1,2,2-Tetrachloroethane					120	
Toluene	170				3100	DL
Chlorobenzene						
Ethylbenzene	670				370	DL
Xylene (total)	1600				2200	DL
Total Concentration	3615		6		6866	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-0000N		PRT-SD-0000S		PRT-SD-0150N		PRT-SD-0150S		PRT-SD-1563N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol							73 J			
4-Methylphenol							62 J			
Hexachloroethane										
2,4-Dimethylphenol							66 J			
1,2,4-Trichlorobenzene										
Naphthalene										
Hexachlorobutadiene										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene			2300 J		57 J					
Acenaphthene										
Dibenzofuran										
2,4-Dinitrotoluene	120 J		2400 J		450		290 J			
Fluorene										
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate					86 JB					
Fluoranthene	59 J				94 J		58 J			
Pyrene	56 J				97 J		43 J			
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene	95 J				120 J		60 J			
bis(2-Ethylhexyl)phthalate							48 J		180 J	
Benzo(b)fluoranthene	69 J				55 J		72 J			
Benzo(k)fluoranthene	66 J				44 J		44 J			
Benzo(a)pyrene										
Indeno(1,2,3-cd)pyrene										
Dibenzo(a,h)anthracene										
Benzo(g,h,i)perylene										
Carbazole										
Total Concentration	465		4700		1003		816		180	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-1563S		PRT-SD-1583N		PRT-SD-1583S		PRT-SD-1608N		PRT-SD-1608S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
4-Methylphenol										
Hexachloroethane										
2,4-Dimethylphenol										
1,2,4-Trichlorobenzene										
Naphthalene										
Hexachlorobutadiene										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene										
Acenaphthene										
Dibenzofuran										
2,4-Dinitrotoluene										
Fluorene										
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate										
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
Benzo(a)anthracene	90	J								
Chrysene	110	J								
bis(2-Ethylhexyl)phthalate										
Benzo(b)fluoranthene	100	J								
Benzo(k)fluoranthene	100	J								
Benzo(a)pyrene	99	J								
Indeno(1,2,3-cd)pyrene	110	J								
Dibenzo(a,h)anthracene										
Benzo(g,h,i)perylene	100	J								
Carbazole										
Total Concentration	709		0		0		0		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-1618N		PRT-SD-1618S		PRT-SD-1665N		PRT-SD-1690N		PRT-SD-1900N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol					70 J					
4-Methylphenol										
Hexachloroethane										
2,4-Dimethylphenol										
1,2,4-Trichlorobenzene										
Naphthalene										
Hexachlorobutadiene										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene										
Acenaphthene										
Dibenzofuran										
2,4-Dinitrotoluene										
Fluorene										
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate							76 JB			
Fluoranthene					97 J					
Pyrene							69 J			
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene					110 J					
bis(2-Ethylhexyl)phthalate					680		260 J			
Benzo(b)fluoranthene										
Benzo(k)fluoranthene										
Benzo(a)pyrene										
Indeno(1,2,3-cd)pyrene										
Dibenzo(a,h)anthracene										
Benzo(g,h,i)perylene										
Carbazole										
Total Concentration	0		0		957		405		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-2007S		PRT-SD-2150N		PRT-SD-2150S		PRT-SD-2150S-DUP		PRT-SD-2400N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
4-Methylphenol										
Hexachloroethane										
2,4-Dimethylphenol										
1,2,4-Trichlorobenzene										
Naphthalene					330	J	620	J		
Hexachlorobutadiene										
2-Methylnaphthalene					180	J	310	J		
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene										
Acenaphthene					710		970	J		
Dibenzofuran					590	J	820	J		
2,4-Dinitrotoluene										
Fluorene					1200		1700	J		
Hexachlorobenzene			95	J						
Pentachlorophenol			60	J						
Phenanthrene			65	J	7200		10000			
Anthracene					1900		2700			
Di-n-Butylphthalate										
Fluoranthene			180	J	4100		8900			
Pyrene			250	J	4500		5600			
Butylbenzylphthalate										
Benzo(a)anthracene			100	J	2500		3300			
Chrysene			190	J	3300		3800			
bis(2-Ethylhexyl)phthalate			480	J	790		650	J		
Benzo(b)fluoranthene			160	J	1800		2800			
Benzo(k)fluoranthene			130	J	2200		2700			
Benzo(a)pyrene			130	J	2100		2800			
Indeno(1,2,3-cd)pyrene			130	J	2100		1900	J		
Dibenzo(a,h)anthracene					810		970	J		
Benzo(g,h,i)perylene			180	J	2000		1900	J		
Carbazole					1200		1800	J		
Total Concentration	0		2150		39510		54240		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-2400S		PRT-SD-2425N		PRT-SD-2425S		PRT-SD-2425S-DUP		PRT-SD-3080N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
4-Methylphenol										
Hexachloroethane										
2,4-Dimethylphenol										
1,2,4-Trichlorobenzene										
Naphthalene										
Hexachlorobutadiene										
2-Methylnaphthalene										
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene										
Acenaphthene										
Dibenzofuran										
2,4-Dinitrotoluene	360	J								
Fluorene	350	J								
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene	230	J	1100	J						
Anthracene	92	J								
Di-n-Butylphthalate	85	JB								
Fluoranthene	110	J	1200	J						
Pyrene			290	J						
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene			370	J						
bis(2-Ethylhexyl)phthalate	410	J								
Benzo(b)fluoranthene										
Benzo(k)fluoranthene										
Benzo(a)pyrene										
Indeno(1,2,3-cd)pyrene										
Dibenzo(a,h)anthracene										
Benzo(g,h,i)perylene										
Carbazole	140	J								
Total Concentration	1777		2960		0		0		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Sediment
Concentrations in ug/kg

Parameter	PRT-SD-3080N		PRT-SD-3080S		PRT-SD-3080S		PRL-SD-OIL-W		PRL-SD-A22	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
4-Methylphenol										
Hexachloroethane									6700000	DL
2,4-Dimethylphenol									18000	J
1,2,4-Trichlorobenzene									250000	
Naphthalene			760000		8300		310 J		30000	J
Hexachlorobutadiene							5100		36000	J
2-Methylnaphthalene			2600000	DL	30000				3000000	DL
Hexachlorocyclopentadiene										
2,6-Dinitrotoluene										
Acenaphthene			120000							
Dibenzofuran										
2,4-Dinitrotoluene										
Fluorene									1800000	DL
Hexachlorobenzene										
Pentachlorophenol										
Phenanthrene			1300000	DL	12000		1400			
Anthracene			140000		1100 J		360 J			
Di-n-Butylphthalate									14000	JB
Fluoranthene	47	J	97000				2100			
Pyrene	49	J	250000		3900		1400			
Butylbenzylphthalate									670000	
Benzo(a)anthracene			44000 J		590 J		860 J			
Chrysene	57	J	110000		1500 J		1000 J			
bis(2-Ethylhexyl)phthalate	70	J	23000 J		710 J		40000		390000	
Benzo(b)fluoranthene					290 J		470 J			
Benzo(k)fluoranthene					270 J		590 J			
Benzo(a)pyrene	48	J			440 J		570 J			
Indeno(1,2,3-cd)pyrene					200 J		340 J			
Dibenzo(a,h)anthracene										
Benzo(g,h,i)perylene					250 J		370 J			
Carbazole							190 J			
Total Concentration	271		5444000		59550		55060		12908000	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Soil

No semivolatile compounds were detected in soil samples collected during the PRDI investigation. These samples are listed below:

PRT-SL- 0000N
PRT-SL- 0000S
PRT-SL- 0150N
PRT-SL- 0150S
PRT-SL- 1583N
PRT-SL- 1583S
PRT-SL- 1700N
PRT-SL- 1700S
PRT-SL- 1900N
PRT-SL- 1900S
PRT-SL- 2007S
PRT-SL- 2007S Dup
PRT-SL- 2150N
PRT-SL- 2150S
PRT-SL- 2150S-Dup
PRT-SL- 2400N
PRT-SL- 2400S
PRT-SL- 3130N
PRT-SL- 3130S
PRT-SL- 3150N
PRT-SL- 3150S

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Water
Cocentrations in ug/L

Parameter	PRT-WT-0000		PRT-WT-0000S		PRT-WT-0150N		PRT-WT-0150S		PRT-WT-1583N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol							6 J			
1,2-Dichlorobenzene							3 J			
2-Methylphenol							3 J			
4-Methylphenol							6 J			
Isophorone							4 J			
2,4-Dimethylphenol							74			
Benzoic acid	3 J		2 J		12 J					
2,4-Dichlorophenol							5 J			
Naphthalene							4 J			
4-Chloroaniline			2 J				28			
2-Methylnaphthalene							4 J			
2,6-Dinitrotoluene	40		23		17					
Acenaphthene										
2,4-Dinitrotoluene	31		24		25		28			
Fluorene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate					2 J		2 J			
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate			1 J							
Carbazole										
Total Concentration	74		52		56		167		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Water
Cocentrations in ug/L

Parameter	PRT-WT-1583S		<i>PRT-WT-1700N</i>		<i>PRT-WT-1700S</i>		<i>PRT-WT-1900</i>		<i>PRT-WT-1900N</i>	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
1,2-Dichlorobenzene										
2-Methylphenol										
4-Methylphenol										
Isophorone										
2,4-Dimethylphenol										
Benzoic acid										
2,4-Dichlorophenol										
Naphthalene										
4-Chloroaniline										
2-Methylnaphthalene										
2,6-Dinitrotoluene										
Acenaphthene										
2,4-Dinitrotoluene										
Fluorene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate			2	J						
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate	4	J	1	JB	2	JB			3	JB
Carbazole										
Total Concentration	4		3		2		0		3	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Water
Cocentrations in ug/L

Parameter	PRT-WT-1900S		PRT-WT-1910N		PRT-WT-1910S		PRT-WT-2007S		PRT-WT-2150N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol							3 J			
1,2-Dichlorobenzene										
2-Methylphenol										
4-Methylphenol										
Isophorone										
2,4-Dimethylphenol										
Benzoic acid					1 J					
2,4-Dichlorophenol										
Naphthalene										
4-Chloroaniline										
2-Methylnaphthalene										
2,6-Dinitrotoluene										
Acenaphthene										
2,4-Dinitrotoluene										
Fluorene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate										
Fluoranthene										
Pyrene										
Butylbenzylphthalate										
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate	2 JB									
Carbazole										
Total Concentration	2		0		1		3		0	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Water
Cocentrations in ug/L

Parameter	PRT-WT-2150S		PRT-WT-2150S-DUP		PRT-WT-2400N		PRT-WT-2400S		PRT-WT-2425N	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
1,2-Dichlorobenzene										
2-Methylphenol										
4-Methylphenol										
Isophorone										
2,4-Dimethylphenol										
Benzoic acid									79	
2,4-Dichlorophenol										
Naphthalene										
4-Chloroaniline										
2-Methylnaphthalene										
2,6-Dinitrotoluene										
Accnaphthene										
2,4-Dinitrotoluene										
Fluorene										
Pentachlorophenol										
Phenanthrene										
Anthracene										
Di-n-Butylphthalate	5	J	5	J						
Fluoranthene										
Pyrene										
Butylbenzylphthalate							2	J		
Benzo(a)anthracene										
Chrysene										
bis(2-Ethylhexyl)phthalate	21								5	J
Carbazole										
Total Concentration	26		5		0		2		84	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of Analytical Results for the PRDI for Semivolatiles in Water
Cocentrations in ug/L

Parameter	PRT-WT-2425N-DUP		PRT-WT-2425S		PRT-WT-2500		PRT-WT-3150N		PRT-WT-3150S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Phenol										
1,2-Dichlorobenzene										
2-Methylphenol										
4-Methylphenol										
Isophorone										
2,4-Dimethylphenol										
Benzoic acid	52		3	J						
2,4-Dichlorophenol										
Naphthalene					410				240	J
4-Chloroaniline										
2-Methylnaphthalene					1500				660	J
2,6-Dinitrotoluene										
Acenaphthene					100	J			130	J
2,4-Dinitrotoluene										
Fluorene					190				240	J
Pentachlorophenol										
Phenanthrene					770				780	
Anthracene					66	J				
Di-n-Butylphthalate										
Fluoranthene					67	J				
Pyrene					170				180	J
Butylbenzylphthalate										
Benzo(a)anthracene					34	J				
Chrysene					80	J			90	J
bis(2-Ethylhexyl)phthalate					1800					
Carbazole					21	J				
Total Concentration	52		3		5208		0		2320	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

**Summary of Analytical Results for the PRDI for Semivolatiles in Water
Concentrations in ug/L**

Parameter	<i>PRL-WT-OIL-W</i>		<i>PRL-WT-A22</i>	
	Value	Qualifier	Value	Qualifier
Phenol				
1,2-Dichlorobenzene				
2-Methylphenol			6	J
4-Methylphenol			90	
Isophorone				
2,4-Dimethylphenol			3	J
Benzoic acid			300	
2,4-Dichlorophenol				
Naphthalene				
4-Chloroaniline				
2-Methylnaphthalene				
2,6-Dinitrotoluene				
Acenaphthene				
2,4-Dinitrotoluene				
Fluorene				
Pentachlorophenol			2	J
Phenanthrene				
Anthracene				
Di-n-Butylphthalate				
Fluoranthene				
Pyrene				
Butylbenzylphthalate				
Benzo(a)anthracene				
Chrysene				
bis(2-Ethylhexyl)phthalate	3	JB		
Carbazole				
Total Concentration	3		401	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.

Summary of TCLP Analytical Results for the PRDI

Parameter	PRT-WT-2500		PRT-WT-3080N		PRT-SD-3080S		PRT-SD-3080S-DL	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Organics, mg/L								
Vinyl chloride								
1,1-dichloroethane								
chloroform								
1,2-dichloroethane								
2-Butanone								
Carbon tetrachloride								
Trichloroethene					0.010	J		
Benzene	0.026	J			2.1	E	2.4	D
Tetrachloroethene					0.061		0.062	JD
Chlorobenzene								
Pyridine								
1,4-dichlorobenzene								
2-methylphenol								
3- and/or 4-methylphenol					0.019	J		
Hexachloroethane								
Nitrobenzene								
Hexachlorobutadiene								
2,4,6-trichlorophenol								
2,4,5-trichlorophenol								
2,4-dinitrotoluene								
Hexachlorobenzene								
Pentachlorophenol								
Inorganics, ug/L								
Arsenic					39.2			
Barium	231		156		847			
Cadmium								
Chromium					99.2			
Lead					653			
Mercury								
Selenium					52.6			
Silver								

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

Summary of Reactivity and Corrosivity Analytical Results for the PRDI

RCRA Characteristics	<i>PRT-WT-2500</i>		<i>PRT-SD-3080N</i>		<i>PRT-SD-3080S</i>	
Parameter	Value	Qualifier	Value	Qualifier	Value	Qualifier
Cyanide, reactive, mg/kg	0.5	U	0.5	U	0.5	U
Sulfide, reactive, mg/kg	25	U	26.9		153	
Corrosivity by pH, S.U.	6.8		7.5		6.6	

Note:

Italics indicate samples which exceeded the sample temperature preservation criteria.

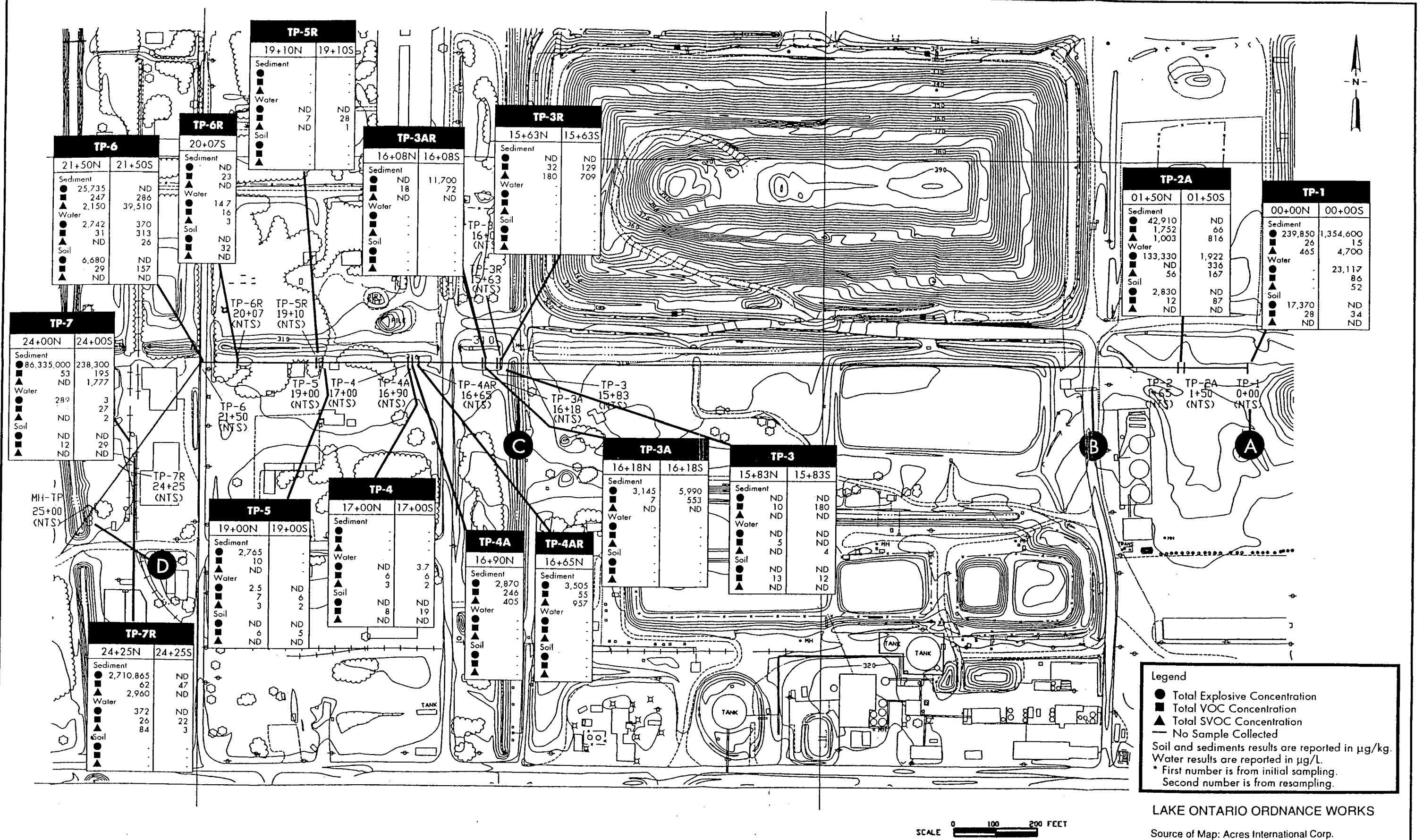
**Summary of PCB Analytical Results for the PRDI
Concentrations in ug/kg**

Parameter	<i>PRT-SD-3080N</i>		PRT-SD-3080N		<i>PRT-SD-3080S</i>		PRT-SD-3080S	
	Value	Qualifier	Value	Qualifier	Value	Qualifier	Value	Qualifier
Aroclor-1016	52	U	46	U	170000	U	19000	U
Aroclor-1221	100	U	92	U	340000	U	37000	U
Aroclor-1232	52	U	46	U	170000	U	19000	U
Aroclor-1242	52	U	46	U	560000		140000	
Aroclor-1248	52	U	46	U	170000	U	19000	U
Aroclor-1254	52	U	46	U	170000	U	19000	U
Aroclor-1260	52	U	46	U	170000	U	19000	U

Note:

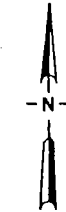
Italics indicate samples which exceeded the sample temperature preservation criteria.

Bold indicates resamples.



E 391500

E 293000



MH	
30+80N*	30+80S*
Sediment	18,350/3,115
● ND/ND	19,830,000/1,928,000
▲ 137/163	5,444,000/59,550
Water	
● ND/271	
▲	
Soil	
●	
▲	

Area 22 Lift Station A22	
Sediment	3,800
● 14,314,000	
▲ 12,908,000	
Water	2.5
● 6,866	
▲ 401	
Soil	
●	
▲	

Area 24 North Oil/Water Separator Lift Station OIL-W	
Sediment	ND
● 315	
▲ 55,060	
Water	ND
● 6	
▲ 3	
Soil	
●	
▲	

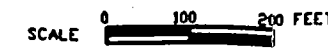
TP-8	
31+50N	31+50S
Sediment	
● 15	ND
▲ 5	3,615
Water	ND
● ND	2,320
▲	
Soil	
● ND	ND
▲ 28	24
●	ND

TP-8R	
31+30N	31+30S
Sediment	
●	
▲	
Water	
●	
▲	
Soil	
● ND	ND
▲ 26	ND
●	

Legend

- Total Explosive Concentration
- Total VOC Concentration
- ▲ Total SVOC Concentration
- No Sample Collected

Soil and sediments results are reported in µg/kg.
Water results are reported in µg/L.
* First number is from initial sampling.
Second number is from resampling.



LAKE ONTARIO ORDNANCE WORKS
Source of Topo. Map: Acres International Corp.

FIGURE 3-2 SUMMARY OF PRDI ANALYTICAL RESULTS



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10162.4 E 10287.2 Elev. 313.09 ft. above msl.

Station: 00+00

Corresponding Test Pit: TP-1 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 1 was constructed in Area C approximately 10' south of the drainage ditch for the access road to the north. The excavation extended south approximately 60'. Two deteriorated manholes were encountered on lateral lines leading to the north and south TNT lines. Area appeared to have been previously disturbed during past construction activities.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>1.5</u> ft. <u>10</u> in. <u>15</u> ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>1.5</u> ft. <u>12</u> in. <u>15</u> ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>3</u> ft. x <u>3</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>0</u> in.* <u>10</u> in.* Observations: <u>Line filled with</u> <u>moist sandy soil. Appears to be fill material</u> <u>which may have entered pipeline during past</u> <u>construction activities. A hydrogen sulfide</u> <u>odor was observed.</u>	<u>2</u> in.* <u>6</u> in.* Observations: <u>Sediment</u> <u>was sandy in texture. A hydrogen sulfide</u> <u>odor was observed.</u>
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If yes, describe): Groundwater was observed seeping into excavation along the outside of the pipelines.		

Note: Soil profile description shown on Test Pit Log for TP-1



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10162.4 E 10287.2 Elev. 313.09 ft. above msl.

Station: 00+00

Corresponding Test Pit: TP-1 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☒ No ☐

If yes, provide following:

Manhole Dimensions:

Diameter NA ft.

Depth NA ft.

Content of Manhole:

Depth of sediment: NA in.

Depth of water: NA in.

Description: No dimensions could be collected.

Manholes were not intact.

Manhole Description:

Sketch:

Condition and Material
Description:

Manholes were caved in
probably due to previous
construction activities in
the area.

Other Observations:

Two buried, deteriorated manholes were encountered. Both manholes are presumed to have been associated with lateral lines which tied-in to the north and south TNT lines. The manhole near the north line is constructed of red brick. The manhole near the south line is constructed of yellow brick.

AIR MONITORING RESULTS

Measurements in Pipeline:

PID background

LEL 0 % Oxygen 20.8 %

FID 0.91 units above background

Other H₂S = background; micro R = background

Measurements in Breathing Zone:

PID background

LEL 0 % Oxygen 20.9 %

FID background

Other miniram = .01; micro R = 5 units (background)

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>							
PRT-SL-0000N	S	10/9/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP
PRT-SL-0000S	S	10/9/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP
PRT-SD-0000N	SE	10/9/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP
PRT-SD-0000S	SE	10/9/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP
PRT-WT-0000S	W	10/9/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP
PRT-WT-0000	W	10/10/96	X	VOA:	X	BNA:	X	EXP;		PCB; TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 1 through 11



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10152.4 E 10115.9 Elev. 312.38 ft. above msl.

Station: 01+50

Corresponding Test Pit: TP-2A (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 2 was constructed in Area C approximately 50' south of the drainage ditch for the access road to the north. The excavation extended south approximately 30'. Test Pit 2 filled in with water before sediment and water samples could be collected. Test Pit 2A was constructed approximately 20' west of Test Pit 2 in order to collect water and sediment samples.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~3 ft. 10 in. 15 ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~3 ft. 12 in. 15 ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>3</u> ft. x <u>3</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>2.5</u> in.* <u>2.5</u> in.* Observations: _____	<u>3</u> in.* <u>3</u> in.* Observations: _____
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, describe): Rainwater/surface water infiltrated TP-2.		

Note: Soil profile description shown on Test Pit Log for TP-2 and TP-2A



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10152.4 E 10115.9 Elev. 312.38 ft. above msl.

Station: 01+50

Corresponding Test Pit: TP-2A (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

Test Pit 2 was backfilled after collecting soil samples on 10/10/96 due to heavy rain. Test Pit 2A was constructed on 10/11/96 approximately 15' west of TP-2. Sediment and water samples were collected from TP-2A. No significant physical differences with respect to the TNT lines were noted between TP-2 and TP-2A.

AIR MONITORING RESULTS

Measurements in Pipeline:

See measurements in breathing zones.

Measurements in Breathing Zone:

PID 0.01 to 2.5 units above background

LEL 0 % Oxygen 21.5 %

FID 0 to 1.5 units above background

Other miniram = 0; micro R = 0

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SL-0150N	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SL-0150S	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SD-0150N	<u>SE</u>	<u>10/11/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SD-0150S	<u>SE</u>	<u>10/11/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-0150N	<u>W</u>	<u>10/11/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-0150S	<u>W</u>	<u>10/11/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 12 through 15



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10111.7 E 8492.9 Elev. 308.89 ft. above msl.

Station: 15+83

Corresponding Test Pit: TP-3 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 3 was constructed east of Cedar Street approximately 10' south of B ditch and 8.5' west of a manhole. Test Pit 3 extended approximately 30 south. Both the north and south lines were visible at the surface in this location.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>0</u> ft. <u>10</u> in. <u>15</u> ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>0</u> ft. <u>18</u> in. <u>15</u> ft.
Condition of concrete encasement	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>4</u> ft. x <u>4</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
Contents of Pipeline: Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>5</u> in.* <u>2.5</u> in.* Observations: Black sediment, some brown clay and roots.	<u>9</u> in.* <u>4.5</u> in.* Observations: Silty sand. Brown color.
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Was groundwater seepage into excavation observed?	Yes <input type="checkbox"/> No <input type="checkbox"/> (If yes, describe):	

Note: Soil profile description shown on Test Pit Log for TP-3



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10111.7 E 8492.9 Elev. 308.89 ft. above msl.

Station: 15+83

Corresponding Test Pit: TP-3 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

AIR MONITORING RESULTS

Measurements in Pipeline:

See measurements in breathing zone.

Measurements in Breathing Zone:

PID 0.02 to .16 units above background

LEL 0 % Oxygen 21.5 %

FID 0.35 to 0.76 units above background

Other minram = 0; micro R = background; H₂S = 0

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SL-1583N	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SL-1583S	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-1583S	<u>W</u>	<u>10/11/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-1583N	<u>W</u>	<u>10/12/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SD-1583S	<u>SE</u>	<u>10/12/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SD-1583N	<u>SE</u>	<u>10/12/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;	<u> </u>	PCB:	<u> </u>	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 16 through 20.



SAMPLING LOG AND REMEDIAL DESIGN INFORMATION

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: 16+18

Corresponding Test Pit: TP-3A (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 3A was constructed approximately 35' west of Test Pit 3. Test Pit 3A was constructed to obtain additional sediment samples. No soil or water samples were collected from this location.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 0 ft. 10 in. 15 ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 0 ft. 10 in. 15 ft.
Condition of concrete encasement	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>
Dimensions of concrete (width x thickness)	2 ft. x 3 ft.	4 ft. x 4 ft.
Condition of pipeline:	Intact <input type="checkbox"/> Damaged <input checked="" type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks: A 2-ft section of pipeline was broken. This section was full of soil.	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	0 in.* 10 in.* Observations: Sediment was similar to surrounding soils.	7.5 in.* 6 in.* Observations:
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Was groundwater seepage into excavation observed?	Yes <input type="checkbox"/> No <input type="checkbox"/> (If yes, describe):	

Note: Soil profile description shown on Test Pit Log for TP-3A



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: 16+18

Corresponding Test Pit: TP-3A (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

AIR MONITORING RESULTS

Measurements in Pipeline:

See TP-3 results.

Measurements in Breathing Zone:

See TP-3 results.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SD-1618N	SE	10/17/96	X	VOA:	X	BNA:	X	EXP:	_____	PCB:	_____	TCLP
PRT-SD-1618S	SE	10/17/96	X	VOA:	X	BNA:	X	EXP:	_____	PCB:	_____	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

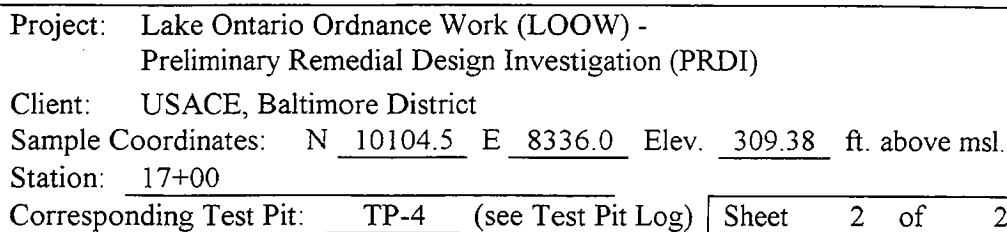
Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)
Client: USACE, Baltimore District
Sample Coordinates: N 10104.5 E 8336.0 Elev. 309.38 ft. above msl.
Station: 17+00
Corresponding Test Pit: TP-4 (see Test Pit Log) Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 4 was constructed approximately 5' south of B ditch and 47' west of Cedar Street. Test Pit 4 extended approximately 20' south.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>1.5</u> ft. <u>10</u> in. <u>15</u> ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>1.5</u> ft. <u>18</u> in. <u>15</u> ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>4</u> ft. x <u>4</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>5</u> in.* <u>2.5</u> in.* Observations: <u>Brown and black soft sediment.</u>	<u>9</u> in.* <u>4.5</u> in.* Observations: _____
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change: _____	Color Change: _____
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If yes, describe): Groundwater with hydrogen sulfide odor was observed seeping into the pit from the east along the south line.		
Note: Soil profile description shown on Test Pit Log for TP-4		





**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: 16+90

Corresponding Test Pit: TP-4A (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 4A was constructed on the north line approximately 10' east of Test Pit 4. Test Pit 4A was constructed solely to obtain additional sediment samples.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) _____ ft. Diameter of pipe _____ in. Distance between centerline of pipes _____ ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~1.5 ft. 10 in. _____ ft.	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> _____ ft. _____ in. _____ ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	2 ft. x 3 ft.	_____ ft. x _____ ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks: _____	Intact <input type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks: _____
<u>Contents of Pipeline:</u> Depth of water in pipeline _____ in.* Depth of sediment in pipeline _____ in.* (* zero if not encountered) Description of water and sediment observed	8 in.* 2.5 in.* Observations: _____ Black and brown soft sediment.	_____ in.* _____ in.* Observations: _____
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change: _____	Color Change: _____
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, describe): _____	

Note: Soil profile description shown on Test Pit Log for TP-4A



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: 16+90

Corresponding Test Pit: TP-4A (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

AIR MONITORING RESULTS

Measurements in Pipeline:

See results for TP-4.

Measurements in Breathing Zone:

See results for TP-4.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SD-1690N	<u>SE</u>	<u>10/17/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	_____	PCB:	_____	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9719.3 E 7580.3 Elev. 312.10 ft. above msl.

Station: 25+00

Corresponding Test Pit: MH-TP (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

The manhole test pit (MH-TP) was constructed around a manhole on the north line. The manhole was exposed at the surface. Excavation was discontinued after an oily liquid entered the excavation. The south line was not encountered in this test pit.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) _____ ft. Diameter of pipe _____ in. Distance between centerline of pipes _____ ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~8 ft. _____ _____ _____	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> _____ _____ _____
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	____ ft. x ____ ft.
Condition of pipeline: Pipe not exposed during excavation.	Intact <input type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks: Pipe not exposed.	Intact <input type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline _____ in.* Depth of sediment in pipeline _____ in.* (* zero if not encountered) Description of water and sediment observed	Observations: _____	Observations: _____
Results of field TNT screening (color change indicates presence of TNT. NA if field screening	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed?	Yes <input type="checkbox"/> No <input type="checkbox"/> (If yes, describe):	

Note: Soil profile description shown on Test Pit Log for MH-TP



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9719.3 E 7580.3 Elev. 312.10 ft. above msl.

Station: 25+00

Corresponding Test Pit: MH-TP (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☒ No ☐

If yes, provide following:

Manhole Dimensions:

Diameter 2-3 ft.

Depth ~10 ft.

Content of Manhole:

Depth of sediment: ~5 ft.

Depth of water: ~10 ft.

Description: Water level to top of manhole.

Debris in manhole not sampled.

Manhole Description:

Sketch:

Condition and Material
Description:

North line manhole intact exposed at ground surface. Filled to ground surface with water. Some debris in manhole.

Other Observations:

The oily substance which entered the excavation was followed by clear water. Sides of excavation were bermed in 3' above ground surface to contain oil. Pumped approximately 4,000 gal. of oily water from excavation prior to plugging hole and backfilling.

AIR MONITORING RESULTS

Measurements in Pipeline:

No air monitoring data recorded.

Measurements in Breathing Zone:

No air monitoring data recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>
PRT-WT-2500	<u>W</u>	<u>10/11/96</u>	<u>X</u> VOA: <u>X</u> BNA: <u>X</u> EXP: <u> </u> PCB: <u> </u> TCLP
PRT-WT-2500	<u>W</u>	<u>10/17/96</u>	VOA: <u> </u> BNA: <u> </u> EXP: <u> </u> PCB: <u>X</u> TCLP

Note: PCB Analysis at sample PRT-WT-2500 was requested following sample collection and shipment. Not enough sample was available to perform this analysis.

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 39, 40, and 41.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10100.5 E 8102.0 Elev. 309.48 ft. above msl.

Station: 19+00

Corresponding Test Pit: TP-5 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 5 was constructed 5' south of B ditch and was extended approximately 30' to the southwest. Test Pit 5 was located in a wooded area between a 2-story building and a concrete containment area.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~2 ft. 10 in. 15 ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~1.5 ft. 18 in. 15 ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>4</u> ft. x <u>4</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	 5 in.* 2.5 in.* Observations: <u>Only limited</u> amount of sediment could be obtained. Hydrogen sulfide odor present.	 9 in.* 4.5 in.* Observations: <u>No sediment</u> could be obtained. Hydrogen sulfide odor present.
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If yes, describe): Groundwater with oily sheen entered pit along the north side of the south line. Approximately 600 gallons of water was pumped from pit and placed in a temporary holding tank.		

Note: Soil profile description shown on Test Pit Log for TP-5



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)
Client: USACE, Baltimore District
Sample Coordinates: N 10100.5 E 8102.0 Elev. 309.48 ft. above msl.
Station: 19+00
Corresponding Test Pit: TP-5 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

No sediment sample from the south line and only a limited amount of sediment from the north line could be collected due to the depth of the coring hole. A two-story building near the test pit is situated on top of the pipeline. Sample PRT-WT-1900 is a water sample collected from the tank containing excavation water which was pumped from TP-5.

AIR MONITORING RESULTS

Measurements in Pipeline:

No air monitoring data recorded.

Measurements in Breathing Zone:

No air monitoring data recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-ST-1900N	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SL-1900S	<u>S</u>	<u>10/10/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-1900N	<u>W</u>	<u>10/14/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-WT-1900S	<u>W</u>	<u>10/14/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRT-SD-1900N	<u>SE</u>	<u>10/14/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
*PRT-WT-1900	<u>W</u>	<u>10/15/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP

*Sample of excavation water which originated from TP-5. Sample was collected from tank.

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 26 through 31.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10096.7 E 7791.5 Elev. 311.59 ft. above msl.

Station: 21+50

Corresponding Test Pit: TP-6 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 6 was constructed parallel to Wesson Street just west of the intersection of the pipeline and Wesson Street.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~4 ft. 10 in. 15 ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> ~4 ft. 18 in. 15 ft.
Condition of concrete encasement	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>	Intact <input type="checkbox"/> Weathered <input checked="" type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u> </u> ft. x <u> </u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input type="checkbox"/> Damaged <input checked="" type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks: Damaged east of test pit. May have occurred during installation of PVC line.
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>2.5</u> in.* <u>7.5</u> in.* Observations: <u>Sediment was</u> <u>clayey in texture. Had red brown color.</u>	<u>2</u> in.* <u>4.5</u> in.* Observations: <u>Sediment was a</u> <u>black ooze. Also noticed some soil in line.</u>
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If yes, describe): Groundwater entered pit. Rose to a level corresponding with the bottom of the south line.		

Note: Soil profile description shown on Test Pit Log for TP-6



SAMPLING LOG AND REMEDIAL DESIGN INFORMATION

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 10096.7 E 7791.5 Elev. 311.59 ft. above msl.

Station: 21+50

Corresponding Test Pit: TP-6 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☒ No ☐

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material Description:

Two buried, deteriorated manholes,
one on each line, were encountered.
North line manhole constructed of red
brick. South line manhole
constructed of yellow brick. North
manhole relatively intact. South
manhole deteriorated.

Other Observations:

Manholes were deteriorated. No dimensions could be obtained. The TNT lines apparently change direction towards the southwest downstream of these manholes. Lines probably extend beneath the corner of Building 16. Test pit fell directly on deteriorated south manhole. North manhole off west site of test pit - not fully exposed. North manhole deteriorated to about 2' below ground surface.

AIR MONITORING RESULTS

Measurements in Pipeline:

No air monitoring data recorded.

Measurements in Breathing Zone:

No air monitoring data recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SL-2150N	<u>S</u>	<u>10/15/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB:		TCLP
PRT-SL-2150S	<u>S</u>	<u>10/16/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB:		TCLP
PRT-WT-2150N	<u>W</u>	<u>10/15/96</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB;		TCLP
PRT-WT-2150S	<u>W</u>	<u>10/16/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB;		TCLP
PRT-SD-2150N	<u>SE</u>	<u>10/15/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB:		TCLP
PRT-SD-2150S	<u>SE</u>	<u>10/16/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP;		PCB;		TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 32 through 36.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9812.4 E 7623.9 Elev. 311.91 ft. above msl.

Station: 24+00

Corresponding Test Pit: TP-7 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 7 was constructed approximately 34' west of Building 22 just west of the railroad tracks. Test Pit 7 extended northwest approximately 85'.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>~4.5</u> ft. <u>10</u> in. <u>10</u> ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>~4.0</u> ft. <u>18</u> in. <u>10</u> ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>4</u> ft. x <u>4</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>6.5</u> in.* <u>2.5</u> in.* Observations: <u>Sandy sediment.</u> <u>Hydrogen sulfide odor was present.</u>	<u>13.5</u> in.* <u>4.5</u> in.* Observations: <u>Sediment was</u> <u>black ooze with petroleum odor.</u>
Results of field TNT screening (color change indicates presence of TNT. NA if no field screening is performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Was groundwater seepage into excavation observed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If yes, describe): Groundwater/surface water was seeping into pit and rose to an elevation corresponding to the top of the north line. Water may be seeping in from railroad ballast on the east side of the excavation.		

Note: Soil profile description shown on Test Pit Log for TP-7



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9812.4 E 7623.9 Elev. 311.91 ft. above msl.

Station: 24+00

Corresponding Test Pit: TP-7 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations:

Railroad tracks may need to be removed in order to excavate pipeline.

AIR MONITORING RESULTS

Measurements in Pipeline:

See breathing zone measurements.

Measurements in Breathing Zone:

PID 0.35 to 0.55 units above background

LEL 0 % Oxygen 21.5% %

FID 1.15 to 1.50 units above background

Other miniram = 0

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>							
PRT-SL-2400N	S	10/12/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP
PRT-SL-2400S	S	10/12/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP
PRT-WT-2400N	WT	10/14/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP
PRT-WT-2400S	WT	10/14/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP
PRT-SD-2400N	SE	10/14/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP
PRT-SD-2400S	SE	10/14/96	X	VOA:	X	BNA:	X	EXP:	PCB:	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 37 and 38.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9169.0 E 7236.1 Elev. 315.16 ft. above msl.

Station: 31+50

Corresponding Test Pit: TP-8 (see Test Pit Log)

Sheet 1 of 2

Location Description/Physical Setting (see site sketch on corresponding Test Pit Log):

Test Pit 8 was constructed in a wooded area approximately 50' southwest of the manholes which comprised station 30+80. Excavation was approximately 95' long x 15' wide x 15' deep.

FIELD OBSERVATION/DESIGN INFORMATION FOR TEST PIT LOCATIONS:

TNT WASTE PIPELINES	NORTH LINE	SOUTH LINE
Were TNT lines encountered in test pit? <u>Pipe Location and Dimensions:</u> Depth below ground surface (top of concrete) Diameter of pipe Distance between centerline of pipes	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>9.5</u> ft. <u>10</u> in. <u>15</u> ft.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>~9</u> ft. <u>18</u> in. <u>15</u> ft.
Condition of concrete encasement	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>	Intact <input checked="" type="checkbox"/> Weathered <input type="checkbox"/>
Dimensions of concrete (width x thickness)	<u>2</u> ft. x <u>3</u> ft.	<u>4</u> ft. x <u>4</u> ft.
Condition of pipeline:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evidence of Leakage <input type="checkbox"/> Describe Damage/ Leaks:	Intact <input checked="" type="checkbox"/> Damaged <input type="checkbox"/> Evident of Leakage <input type="checkbox"/> Describe Damage/Leaks:
<u>Contents of Pipeline:</u> Depth of water in pipeline Depth of sediment in pipeline (* zero if not encountered) Description of water and sediment observed	<u>10</u> in.* <u>0</u> in.* Observations: <u>No sediments were detected although wastewater flowed rapidly from pipe during sampling.</u>	<u>18</u> in.* <u>0</u> in.* Observations: <u>No sediments were detected although wastewater flowed rapidly from pipe during sampling.</u>
Results of field TNT screening (color change indicates presence of TNT. NA if field screening is not performed).	Color Change:	Color Change:
Was crystalline material observed? No	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA <input type="checkbox"/>
Was groundwater seepage into excavation observed?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (If yes, describe):	

Note: Soil profile description shown on Test Pit Log for TP-8



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N 9169.0 E 7236.1 Elev. 315.16 ft. above msl.

Station: 31+50

Corresponding Test Pit: TP-8 (see Test Pit Log) Sheet 2 of 2

FIELD OBSERVATIONS/DESIGN INFORMATION (CONTINUED):

MANHOLES

Where manholes encountered in test pit? Yes ☐ No ☒

If yes, provide following:

Manhole Dimensions:

Diameter _____ ft.

Depth _____ ft.

Content of Manhole:

Depth of sediment: _____ in.

Depth of water: _____ in.

Description: _____

Manhole Description:

Sketch:

Condition and Material
Description:

Other Observations: Wastewater from north line was colorless and had strong hydrogen sulfide odor. Wastewater from south line was black in color and oily in nature with a heavy petroleum odor. The oily liquid from the south line was more viscous than water. No sediment samples were collected from either line. Waste liquids in both lines discharged upon opening the lines indicating the lines in this section are under pressure.

AIR MONITORING RESULTS

Measurements in Pipeline:

No air monitoring data recorded.

Measurements in Breathing Zone:

No air monitoring data recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRT-SL-3150N	<u>S</u>	<u>10/14/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	_____	PCB:	_____	TCLP
PRT-SL-3150S	<u>S</u>	<u>10/14/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	_____	PCB:	_____	TCLP
PRT-WT-3150N	<u>W</u>	<u>10/15/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	_____	PCB:	_____	TCLP
PRT-WT-3150S	<u>W</u>	<u>10/15/96</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	_____	PCB:	_____	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photograph 45.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: Area 22 Lift Station

Sheet 1 of 1

FIELD OBSERVATIONS/DESIGN INFORMATION FOR MANHOLE LOCATIONS
MANHOLES WERE SAMPLED AT TWO LIFT STATIONS AND AT STATION 30+80

Location/Physical Setting:

The Area 22 lift station consists of a manhole location located just south of Building 22.

Manhole Dimensions:

Diameter unknown ft.

Depth 11 ft.

Content of Manhole:

Depth of sediment: 0 in.

Depth of water: 11 in.

Description: No significant sediment was
measured in the bottom of the manhole.

Manhole Description:

Sketch:

Condition and Material
Description:

Manhole seemed to be
intact. Construction
materials could not be
determined as manhole was
full of liquid (up to ground
surface)

Other Observations:

Water in manhole was colorless and had no strong odor at time of initial water sampling activities.

However, once the water was agitated during dredge sampling, a heavy oily sheen developed and a strong pesticide/solvent odor was emitted. Only a thin layer of degraded leaves with small amount of silt was encountered on the bottom of the manhole.

AIR MONITORING RESULTS

Measurements in Manhole:

PID 67 units above background

LEL _____ % Oxygen _____ %

FID 297 units above background

Other _____

Measurements in Breathing Zone:

PID _____ units above background

LEL _____ % Oxygen _____ %

FID _____ units above background

Other _____

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRL-WT-A22	<u>W</u>	<u>10/15/92</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;	<u> </u>	PCB;	<u> </u>	TCLP
PRL-SD-A22	<u>SE</u>	<u>10/15/92</u>	<u>X</u>	VOA;	<u>X</u>	BNA:	<u>X</u>	EXP;	<u> </u>	PCB;	<u> </u>	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: Area 22 Lift Station

Sheet 1 of 1

FIELD OBSERVATIONS/DESIGN INFORMATION FOR MANHOLE LOCATIONS
MANHOLES WERE SAMPLED AT TWO LIFT STATIONS AND AT STATION 30+80

Location/Physical Setting:

The Area 22 lift station consists of a manhole location located just south of Building 22.

Manhole Dimensions:

Diameter unknown ft.

Depth 11 ft.

Content of Manhole:

Depth of sediment: 0 in.

Depth of water: 11 in.

Description: No significant sediment was
measured in the bottom of the manhole.

Manhole Description:

Sketch:

Condition and Material
Description:

Manhole seemed to be
intact. Construction
materials could not be
determined as manhole was
full of liquid (up to ground
surface)

Other Observations:

Water in manhole was colorless and had no strong odor at time of initial water sampling activities. However, once the water was agitated during dredge sampling, a heavy oily sheen developed and a strong pesticide/solvent odor was emitted. Only a thin layer of degraded leaves with small amount of silt was encountered on the bottom of the manhole.

AIR MONITORING RESULTS

Measurements in Manhole:

PID 67 units above background

LEL _____ % Oxygen _____ %

FID 297 units above background

Other _____

Measurements in Breathing Zone:

PID _____ units above background

LEL _____ % Oxygen _____ %

FID _____ units above background

Other _____

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRL-WT-A22	<u>W</u>	<u>10/15/92</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRL-SD-A22	<u>SE</u>	<u>10/15/92</u>	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: Oil Water Separator Lift Station

Sheet 1 of 1

FIELD OBSERVATIONS/DESIGN INFORMATION FOR MANHOLE LOCATIONS
MANHOLES WERE SAMPLED AT TWO LIFT STATIONS AND AT STATION 30+80

Location/Physical Setting:

The oil water separator lift station consists of a manhole located just west of Wesson Street and just east of the acid neutralization lagoon.

Manhole Dimensions:

Diameter unknown ft.

Depth 10 ft.

Content of Manhole:

Depth of sediment: 0 in.

Depth of water: 6 in.

Description: No significant amount of sediment
was measured in manhole.

Manhole Description:

Sketch:

Condition and Material

Description:

Brick-lined manhole appeared
to be in good condition.

Other Observations:

No significant amount of sediment was detected in this manhole. A thin layer of degraded leaves with a small amount silt of was present on the bottom of the manhole. Water from the manhole was clear and no strong odors were noticed.

AIR MONITORING RESULTS

Measurements in Manhole:

No air monitoring results recorded.

Measurements in Breathing Zone:

No air monitoring results recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>									
PRL-WT-OIL-W	W	10-15-96	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP
PRL-SD-OIL-W	SE	10-15-96	<u>X</u>	VOA:	<u>X</u>	BNA:	<u>X</u>	EXP:	<u> </u>	PCB:	<u> </u>	TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 46 and 47.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)

Client: USACE, Baltimore District

Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.

Station: 30+80S

Sheet 1 of 1

FIELD OBSERVATIONS/DESIGN INFORMATION FOR MANHOLE LOCATIONS
MANHOLES WERE SAMPLED AT TWO LIFT STATIONS AND AT STATION 30+80

Location/Physical Setting:

Manhole on south line upstream from TP-8.

Manhole Dimensions:

Diameter unknown ft.

Depth 10.5 ft.

Content of Manhole:

Depth of sediment: 0-12 in.

Depth of water: ~10 ft.

Description: Sediment was black ooze with some degraded organic matter including leaves and twigs.

Manhole Description:

Sketch:

**Condition and Material
Description:**

Brick-lined manhole appears
to be in good condition.

Other Observations:

Manhole was located in a wooded area consisting of small trees and brush. Manhole was visible at surface and had been uncovered prior to this investigation.

AIR MONITORING RESULTS

Measurements in Manhole:

No air monitoring data recorded.

Measurements in Breathing Zone:

No air monitoring data recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>
PRT-SD-3080S	<u>SE</u>	<u>10/16/96</u>	<u>X</u> VOA: <u>X</u> BNA: <u>X</u> EXP: <u> </u> PCB: <u> </u> TCLP
PRT-SD-3080S	<u>SE</u>	<u>10/17/96</u>	<u> </u> VOA: <u> </u> BNA: <u> </u> EXP: <u> </u> PCB: <u>X</u> TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photographs 43 and 44.



**SAMPLING LOG AND
REMEDIAL DESIGN
INFORMATION**

Project: Lake Ontario Ordnance Work (LOOW) -
Preliminary Remedial Design Investigation (PRDI)
Client: USACE, Baltimore District
Sample Coordinates: N _____ E _____ Elev. _____ ft. above msl.
Station: 30+80 N

Sheet 1 of 1

FIELD OBSERVATIONS/DESIGN INFORMATION FOR MANHOLE LOCATIONS
MANHOLES WERE SAMPLED AT TWO LIFT STATIONS AND AT STATION 30+80

Location/Physical Setting:
Manhole on north line upstream of TP-8.

Manhole Dimensions:

Diameter unknown ft.

Depth 10.5 ft.

Content of Manhole:

Depth of sediment: 6 in.

Depth of water: ~10 ft.

Description: Sediment was fine black organic
material (degraded twigs, etc.)

Manhole Description:

Sketch:

Condition and Material
Description:
Brick-lined manhole appeared
to be in good condition.

Other Observations:

Manhole was located in wooded area consisting mostly of small trees and brush. Manhole was visible at surface and had been covered prior to this investigation. Field test for TNT conducted on sediment sample was negative.

AIR MONITORING RESULTS

Measurements in Manhole:

No air monitoring results recorded.

Measurements in Breathing Zone:

No air monitoring results recorded.

SUMMARY OF SAMPLES COLLECTED

<u>Sample ID</u>	<u>Matrix</u>	<u>Date</u>	<u>Analyses</u>
PRT-SD-3080N	SE	10/16/96	X VOA: X BNA: X EXP: X PCB: TCLP
PRT-WT-3080N	SE	10/17/96	VOA: BNA: EXP: PCB: X TCLP

CORRESPONDING PHOTOGRAPH NUMBERS:

Photograph 42.

Table 2-5

**Summary of Analyses of TNT Waste Pipeline Samples
Acres Supplemental Remedial Investigation**

Parameter (mg/kg)	TNT-1-89-W	TNT-1-89-S	TNT-2-89-W	TNT-2-89-S
HMX	80	—	—	—
RDX	6	—	—	—
TNB	17	—	—	—
TNT	18,019	4.96	—	—
2,4-DNT	6,957	1.56	—	—
Total	25,079	6.52	—	—

Explosives analyses of samples performed by Missouri River Division (MRD) Laboratory according to USATHAMA Method SM-02.

No data entry indicates compound not detected.

Explosives compounds are as follows:

MX - Cyclotetramethylenetetranitramine
RDX - Cyclotrimethylenetrinitramine
TNB - Trinitrobenzene
TNT - Trinitrotoluene
2,4-DNT - 2,4-Dinitrotoluene

W - indicates waste residue sample.

S - indicates adjacent soil sample.

In 1982, SCA also detected up to 35% by weight TNT; analytical data not available.

Table 2-6

**Analytical Results—TNT Sewer Line
by CWM, 1990**

Parameter	South Line		North Line		Roll-off
	Solid	Aqueous	Solid	Aqueous	Solid
Volatiles	($\mu\text{g/Kg}$)	($\mu\text{g/L}$)	($\mu\text{g/Kg}$)	($\mu\text{g/L}$)	($\mu\text{g/Kg}$)
Acetone	5800E	32000D*			
Benzene	260	790			
2-Butanone	630*	5800DJ			
Chlorobenzene	150	640			
1,1-Dichloroethane		12000D			
1,2-Dichloroethane	37	540			
1,1-Dichloroethene	950*	64*			
trans-1,2-Dichloroethene	6.4J	130			
1,2-Dichloropropane		31*			
Ethyl Benzene	130	400			
2-Hexanone	35J	210J			
4-Methyl 2-Pentanone	1000E*	8600D*			
Methylene Chloride	270	8500D*			
Tetrachloroethane		360			
Toluene	940	5800D			6.2*
1,1,1-Trichloroethane			5.1		
Trichloroethene	130	7700D			
Vinyl Chloride	160*	720			
Xylenes	270	1300			
TOTAL	10,768.4	85,585	5.1	—	6.2

Table 2-6

**Analytical Results—TNT Sewer Line
by CWM, 1990
(Continued)**

Parameter	South Line		North Line		Roll-off
	Solid	Aqueous	Solid	Aqueous	Solid
Semivolatiles	(µg/Kg)	(µg/L)	(µg/Kg)	(µg/L)	(µg/Kg)
Acenaphthalene	690*				
Benzoic Acid	9400	99000D			
2,4-Dimethylphenol	1800*	9700D*			830*
4-Methylphenol	3900	20000D*			
Phenol	4700	77000D*			1900*
TOTAL	20,490	205,700	—	—	2,730
Pesticides/PCBs	(µg/Kg)	(µg/L)	(µg/Kg)	(µg/L)	(µg/Kg)
Aldrin	5.4				
Endosulfan I			37		
Inorganics	(mg/Kg)	(mg/L)	(mg/Kg)	(mg/L)	(mg/Kg)
Antimony	ND	ND	ND	ND	ND
Arsenic	10.7	0.542	10.1	0.052	12.6
Beryllium	ND	0.0030	ND	0.003	ND
Boron	ND	ND	ND	ND	ND
Cadmium	ND	ND	ND	ND	ND
Chromium	6.7	0.25	8.8	0.028	14
Copper	12	0.36	17	0.12	25
Lead	27.2	0.656	9.36	0.145	5.92
Lithium	ND	4.1	ND	3.9	ND
Mercury	ND	ND	ND	ND	ND
Nickel	10	0.82	12	0.92	17
Selenium	ND	ND	ND	ND	ND

Table 2-6

**Analytical Results—TNT Sewer Line
by CWM, 1990
(Continued)**

Parameter	South Line		North Line		Roll-off
	Solid	Aqueous	Solid	Aqueous	Solid
Inorganics (cont.'d)	(mg/Kg)	(mg/L)	(mg/Kg)	(mg/L)	(mg/Kg)
Silver	ND	ND	ND	ND	ND
Zinc	24	0.79	32	0.44	39
Cyanide	0.044		0.046		0.43
Cyanide, amenable	0.037		0.019		
Nitrate	15.5(mg/L)	10.9	8.63	3.95	
Sulfate	500	378	912	832	194
Sulfide	5.1		2.1		70
% Moisture	33.0		24.3		14.8
Nitroaromatics	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
Tetryl	—	6820Y	294Y	42.0	650Y
2,4,6-Trinitrotoluene	—	3000Y	213Y	161Y	467Y
TOTAL	—	9,820	507	203	1,117

No data entry indicates parameter not detected.

* - Indicates estimated result less than five times the detection limit.

E - Indicates estimated result.

D - Indicates sample diluted for the analyte.

J - Indicates concentration detected less than detection limit.

Y - Indicated result exceeds validation range for this compound.

SECTION 02229

EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

1.1.1 General

The work to be completed under this section includes the excavation, removal, and disposal of designated segments of TNT pipelines, including manholes and laterals, and associated materials. Treatment/disposal of all pipeline materials, soils, sediments, liquids exceeding cleanup criteria, and all wastes generated during the work shall be performed by the Contractor, using a professional Explosives Expert as necessary for potentially detonable materials. The Contractor shall furnish all labor, materials, equipment, and services necessary to complete the work required in the Specifications and as shown in the Drawings.

1.1.2 Health and Safety

All work shall be conducted in accordance with the Contractor's Site Specific Health and Safety Plan.

1.1.3 Surface Preparation

Surface preparation and construction of erosion, runoff, and runoff controls to minimize surface water entering the excavation shall be performed prior to excavation work in each area in accordance with those subsections within Section 01561: ENVIRONMENTAL PROTECTION.

1.1.4 Clearing and Grubbing

Clearing and grubbing shall be performed prior to excavation work in accordance with Section 02110: CLEARING AND GRUBBING.

1.1.5 Excavation Shoring and Bracing

For all excavations, the Contractor shall provide all necessary bracing and shoring in accordance with OSHA requirements 29 CFR Part 1926. The Contractor shall submit, for approval, an Excavation Plan detailing the method(s) to be employed to guard against collapse of the excavation sidewalls as part of the **Site Operations Plan**. At his option, and where conditions permit, the Contractor may slope and bench the sidewalls of the excavations or use a method of shoring such as sheet pile, timber lagging or other excavation support methods. The Contractor shall describe in detail in the Excavation Plan the methodology to be used for stabilizing/supporting the excavation during operations within the excavation. When selecting a method, the Contractor should give consideration not only to slope stability, site access but also to dewatering requirements. The Contractor shall remove, decontaminate, and dispose of all shoring materials off-site in accordance with Section 02143: DECONTAMINATION OF CONSTRUCTION OF CONSTRUCTION EQUIPMENT. Remote sampling is the preferred method to obtain verification samples in the excavations. However, if sampling personnel must enter the excavation, the Contractor shall provide excavation support methods that will ensure safe conditions for sampling personnel working in the excavation.

1.1.6 Liquids Management

Groundwater, surface water or other liquids encountered during excavation activity shall be handled in accordance with Section 02141: LIQUIDS HANDLING AND DISPOSAL. Dewatering shall be considered incidental to excavation work and the Contractor will be responsible for controlling storm water in-flow so as to minimize the volume of water within the excavation. Storm water diversions such as berms and channels shall be used to divert run-off away from remediation areas and, in particular, away from excavations.

1.1.7 Dust Control

Dust control, as described in Section 01561: ENVIRONMENTAL PROTECTION, will be required to control particulate movement. Strict dust controls and air quality monitoring of the work area shall be performed by the Contractor during excavation activities.

1.1.8 Utilities

The Contractor shall locate all utilities within the excavation or staging areas prior to any excavation activities. If necessary, the Contractor shall relocate, either temporarily or permanently, as determined by the Contracting Officer, any utilities which cannot be adequately protected during excavation and staging activities or which prevent excavation activities from proceeding. The Contractor shall repair any damage caused to utilities by his activities at no additional cost to the Government.

1.1.9 Performance of Work

The Contractor shall perform all work in accordance with all federal, state, and local laws and/or requirements.

1.1.10 Excavation

During excavation in each remediation area, excavated soils shall be transferred to the lined staging area(s) using inter-model boxes, loaders, dumptrucks, or equal. During loading of excavated soil, the trucks will be staged and loaded outside of the exclusion zone in a manner that controls and contains spillage. Soils containing explosive compounds that exceed the soil clean-up criteria and cannot be used as backfill, shall be stockpiled separately from other stockpiled soils. The Contractor is responsible for the containerization, transport, and treatment/disposal of soils and sediments containing explosive compounds in exceedance of the criteria unless otherwise directed by the USACE and CO. Any crystalline material encountered in the TNT pipeline will be removed under the supervision of the Contractor's Explosives Expert. The Contractor's Explosives Expert shall place the crystalline material in a nonsparking container and transport these materials to the adjacent New York Army National Guard property to a secure site pre-determined by USACE, and shall be treated/destroyed and/or disposed by the Contractor's Explosives Expert.

1.1.11 Equipment Decontamination

Excavation and miscellaneous equipment working inside an exclusion zone that comes in contact with soil shall be decontaminated prior to moving outside of the exclusion zone and into another work area. If only the bucket of the excavation equipment comes in contact with contaminated soils or enters the exclusion zone, the bucket may be cleaned of gross contamination and the excavation equipment moved to another work area. In addition, heavy mill plastic or other impenetrable barrier material may be placed under the trucks/wheels of equipment entering the exclusion zone to allow the equipment to work "clean". Equipment kept clean may not have to be decontaminated before moving out of the exclusion zone. Truck access roads within the exclusion zone shall be kept clean by restricting traffic on the roads to clean trucks/equipment only or by provided temporary liners for "dirty" work that can

be removed for access of clean vehicles. The coordination of staging, storing and transport of contaminated materials shall be outlined in the Contractor's Excavation Plan.

The Contractor and the Contracting Officer must inspect the equipment to determine if it remained clean and if they agree that the equipment remained clean, it may be moved without decontamination. If determined that the equipment is not clean, it must be decontaminated prior to removal from the exclusion zone.

1.1.12 Equipment and Personnel

The Contractor shall provide equipment and personnel to excavate, stage, handle, and load soil contaminated and associated liquids using methods that will prevent adverse effects to the surrounding environment (soil, water, and air).

1.2 SUBMITTALS

1.2.1 Excavation Staging and Handling Plan - TNT Pipeline

Thirty calendar days following the Notice to Proceed and prior to the Preconstruction Plan Review Conference, the Contractor shall submit for the Contracting Officer's review a Preliminary Excavation Staging and Handling Plan (Excavation Plan) as part of the **Site Operations Plan** for earthwork to be accomplished. The Excavation Plans shall include the proposed sequence of operations; method for excavating below 4 ft in depth; method for excavating, storing, and disposing of contaminated soil, clean and backfill soil; method for excavating, decontaminating, storing, crushing, and disposing of pipeline materials including concrete encasement; the type, rated capacity, and quantity of equipment to be used in the excavation phase or sequence; plans showing locations and configuration of proposed temporary stockpiles and equipment decontamination areas; method to main access roads leading out of the exclusion zone clean; maintaining clean vehicles during loading operations and exiting from site; and the drainage and dewatering methods to control and remove surface water and groundwater flowing toward and tending to collect in excavations. If onsite stabilization will be used for soils/sludges/sediment prior to offsite disposal, the Plan shall provide the stabilization method, including reagent/ad mixture/recipe, mixing method and equipment, environmental controls, and performance testing. The Contractor shall incorporate all comments received from the Contracting Officer at the Preconstruction Plan Review Conference and submit a Final Excavation Plan within 30 days after the conference. Excavations shall be made and maintained in accordance with the approved Excavation Plan and, if the required results are not obtained, the Contractor shall revise his plans in writing before changing the work procedures.

1.2.2 Explosive Operations Plan

The Contractor shall provide an Explosives Operations Plan as part of the SSHP. If potentially explosive crystalline material is discovered at any time during operations, the Contractor shall immediately stop operations in the affected area, mark the location, notify onsite personnel of the potential explosive hazard and the area's restrictions, and notify the Contracting Officer. The Contractor's subcontracted Explosives Expert will make appropriate arrangements for evaluation and proper disposal of the crystalline material. The Contractor's Explosives Expert shall be responsible for the handling and transport of any crystalline detonable material in a safe manner to the adjacent New York Army National Guard property as prearranged by USACE. The Contractor's Explosives Expert shall then be responsible for the treatment and disposal of the crystalline material. The Explosives Operations Plan as part of the SSHP shall specifically address procedures to be followed, if known or potential explosive material or other such items are encountered during any phase of field work. The Explosives Operations Plan shall be prepared by the Explosives Expert and include procedures for excavation of the TNT pipeline and the handling, storage, transportation, treatment, and disposal of crystalline/detonable materials.

PART 2 PRODUCT

2.1 STAGING AREAS

2.1.1 Impermeable Barrier

The impermeable barrier shall consist of a 40-mil, high-density polyethylene (HDPE) geomembrane.

PART 3 EXECUTION

3.1 EXCAVATION AND REMOVAL

3.1.1 Equipment and Personnel

The Contractor shall provide all labor, materials, equipment, and services for the following:

3.1.1.1 Identification and Delineation

Field identification, delineation, and marking of TNT Pipeline Segments to be removed, as shown on the Drawings. The Contractor shall perform all surveying as necessary for the performance of the work. Surveying to determine quantities shall be performed by an independent surveyor registered in the State of New York. The Contractor shall be responsible for laying out the centerline of the north and south TNT pipelines; providing a survey of the existing surface elevations (topographical survey of area, approximately 25 feet from pipeline centerline, to be excavated for pipeline access); performing any intermediate surveying as needed; performing final survey of excavated depths and dimensions; and providing a final grade survey of backfilled areas.

The Contractor shall coordinate all survey work with the CO prior to and during work activities at the site. The Contractor shall notify the CO when the excavation of each pipeline has been completed and the bedding soil have been exposed. The Contractor's Surveyor will then survey the area to verify the depths excavated. Additional excavation based on confirmation sampling will be maintained by intermediate surveys until the CO notifies the Contractor that excavation is complete. The Contractor will then survey the areas for final excavated dimensions and depths prior to backfilling. All coordinate and elevation data shall be determined to the nearest 0.01 ft. Horizontal measurements shall be tied into the CWM facility coordinate system. All elevations will be referenced to the National Geodetic Vertical Datum of 1929.

3.1.1.2 Soil Stockpiling

Establishment and Maintenance of segregated stockpiling and staging areas for clean soils, contaminated soils and sediments, and pipeline materials, in accordance with this section.

3.1.1.3 Erosion and Sedimentation Controls

Establishment of required erosion and sedimentation controls and stormwater controls for excavation and stockpiling areas in accordance with the approved Erosion and Sedimentation Control Plan.

3.1.1.4 Temporary Stockpiling

Excavation and temporary stockpiling of soils overlying and surrounding the TNT Pipeline. Excavation shall be conducted in intervals and using methods determined by the Contractor to reduce or minimize stormwater management and to facilitate safe removal of the TNT Pipeline. The depth and lateral extent of excavation shall be sufficient to safely expose the TNT Pipeline for removal. All excavation shall be planned and executed to minimize unnecessary disturbance to surrounding areas, structures, and

pavements. Provisions for ensuring stability of the excavation and nearby structures, including but not limited to, side slopes, sheeting, shoring, and bracing, are the responsibility of the Contractor, shall be designed by a qualified civil engineer, and meet OSHA requirements as applicable to ensure worker safety.

3.1.1.5 Backfill

Acceptable backfill material must not contain soils with concentrations greater than the cleanup criteria. Based on the results of the PRDI, it is anticipated that most of the soils excavated above the pipeline and over-excavated for the purpose of sloping or benching will be suitable backfill according to this criteria. The Contractor shall minimize the volumes of soil excavated to minimize the quantity of soils handled, staged and stockpiled. The Contractor shall establish a methodology to be used for stabilizing/supporting the excavation. The methodology must be cost effective, minimize the amount of over excavation, and allow for confirmation and verification soil sampling. The cost for any stabilizing/supporting method shall be borne by the Contractor.

3.1.1.6 Excavation Shoring and Bracing

The Contractor is required to provide proper support for all excavations to meet OSHA requirement for access of the Contractor's sampling personnel, if sampling personnel must enter the excavation area. This may include sloping, benching, or other excavation support methods to stabilize the sides of the excavation. **The Contractor will perform this work in a manner that will minimize the amount of extraneous soil excavated or shoring materials used that may have to be disposed of as hazardous material.** The contractor is responsible for the removal of all water entering the excavation resulting from direct precipitation, site runoff, groundwater seepage, runoff, etc. The Contractor shall handle this water according to procedures described in Section 02141, LIQUIDS HANDLING AND DISPOSAL.

3.1.1.7 Obstructions

The Contractor shall remove all obstructions from the surface of the excavations as necessary to perform the work. In the case of roadways, bituminous pavement (asphalt) and gravel subbase, if these are determined clean, by the Contracting Officer, they may be removed and handled as construction debris.

Sections of the TNT pipeline are located adjacent to underneath active access roads used by CWM as part of their RCRA TSDF facility operations. Partial closures of roadways during excavation operations shall be limited to a time period coordinated with CWM through the Contracting Officer. If complete closure of a roadway is required, the Contractor is restricted to a Friday to Monday time period for full closure, with partial or full access available to CWM by Tuesday morning. Temporary sheeting and shoring may be required to maintain the roadway open during required active periods. Closures shall be limited and coordinated with CWM through the Contracting Officer. Any pavement requiring removal shall be saw-cut to minimize the extent of removal and disturbance to adjacent pavement. The Contractor shall replace all roadways disturbed as a result of excavations in accordance with the specifications and drawings.

3.1.1.8 Overlying Uncontaminated Soils

Overlying uncontaminated soils shall be stockpiled for use as trench backfill. If overlying or surrounding soils are suspected of being contaminated, the Contractor shall sample and analyze the soils in accordance with Section 02010: CONFIRMATION, VERIFICATION, AND POST IRA SAMPLING. Contaminated soils shall be managed in accordance with this section. Other overlying materials, such as but not necessarily limited to, asphalt and road construction materials removed to access the pipeline shall be considered construction/demolition debris and managed in accordance with this section.

3.1.1.9 Removal of TNT Pipeline Liquids

Removal, containment and management of accumulated pipeline liquids, if encountered, in accordance with Section 02228: FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE and Section 2141: DEWATERING LIQUIDS AND HANDLING.

3.1.1.10 TNT Pipeline Removal

Removal of the TNT pipeline, laterals, and manholes, including the surrounding concrete as designated on the Drawings.

3.1.1.11 Removal of TNT Pipeline Sediments

Manual segregation of sediments from TNT Pipeline materials for separate staging and disposal. The Contractor may propose alternate methods to be used, which may include power washing of pipeline materials in a lined staging/decontamination area. The sediments shall be removed from the pipeline to allow for disposal of the pipeline and concrete encasement as nonhazardous construction/demolition waste. The Contractor's Explosives Expert shall determine whether crystalline explosives or potentially detonable materials are present. Such materials shall be segregated for treatment/disposal by the Explosives Expert as provided in this Section. Decontaminated concrete/pipeline materials and contaminated sediments shall be staged separate as provided in this section.

3.1.1.12 Confirmation, Verification, and Post-Interim Removal Action Sampling

Confirmation, verification, and Post-Interim Removal Action sampling and analysis of soils underlying/surrounding the pipeline to determine that cleanup criteria have been achieved in accordance with Section 2010: CONFIRMATION, VERIFICATION, AND POST-INTERIM REMOVAL ACTION SAMPLING.

3.1.1.13 Exceedance of Cleanup Criteria

For any areas where confirmation sampling and analysis demonstrates exceedance of cleanup criteria, the Contractor shall conduct additional soil excavation/stockpiling, after obtaining approval by the Contracting Officer, followed by confirmation sampling and analysis. This procedure shall be repeated until sampling and analysis demonstrates that soil cleanup criteria have been achieved.

3.1.1.14 Disposal of Excavated Materials

Disposal of excavated materials including but not limited to pipeline liquids and pipeline materials, according to their waste characterization. The Contractor is responsible for the containerization and transport to a competitively bid disposal facility of pipeline materials, pipeline sediments, and soils that exceed the NYSDEC cleanup criteria. The Contractor shall remove the sediment from the pipeline and decontaminate the pipeline to allow for disposal as nonhazardous construction demolition waste. The Contractor shall dewater and provide for stabilization of the sediments according to the treatment/disposal facility requirements. Stabilization may be conducted by the receiving Facility or onsite by the Contractor. The Contractor is responsible for any additional characterization testing of wastes required by the disposal facility.

3.1.1.15 Transportation of Materials

The Contractor will arrange for transportation and disposal of contaminated soils, pipeline materials, and liquids from the remediation site to the treatment/disposal facilities. The Contractor shall coordinate disposal truck traffic to and from the excavation areas to ensure easy flow of traffic through the site that will not interfere with site activities and CWM's RCRA TSDF facility operation. The

Contractor is responsible for the construction, maintenance, and ultimate removal of temporary construction access roads. The Contractor is responsible for maintaining access road, within the exclusion zone to be used by off-site transport vehicles, clean of known or potentially contaminated materials. Restricted traffic and temporary liners shall be used to maintain these access road clean. The construction exits shall be maintained to keep the site access roads free of soil and sediment.

3.1.1.16 Backfilling

Backfill of all excavations with clean soil as provided in Section 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS of the Specifications.

3.1.1.17 Restoration

Restoration of all disturbed areas to preexisting conditions including as appropriate rough and final grading, topsoil/seeding/mulching and/or repair/replacement of paved areas in accordance with the specifications.

3.2 DRAINAGE AND DEWATERING

3.2.1 Control

The Contractor shall control all surface water and groundwater, regardless of origin, nature, or quantity, flowing toward and collecting within excavations. All activities, including but not limited to excavation, stockpiled materials, access construction, site grading and fill placement shall be performed in such manner that the excavation areas of the site and the area immediately surrounding the excavation areas will be continually and effectively drained by temporary swales, ditches, diversion berms, pumps, or other suitable means as determined and employed by the Contractor.

3.2.2 Excavation Bottoms

Excavation bottoms and fill subgrades shall be drained and kept dry by methods that will prevent wetting or softening of the exposed soil surfaces so as to provide for a relatively stable working surface and unyielding subgrade for subsequent backfilling operations.

3.2.3 Drainage and Dewatering Methods

Methods of providing adequate drainage and dewatering shall be at the Contractor's discretion. The Contractor shall continuously monitor the dewatering methods and equipment employed to ensure they are functioning properly and are not causing damage or settlement to adjacent surfaces or structures. The Contractor shall repair and/or restore any damaged areas at no additional cost to the Government.

3.2.4 Potentially Contaminated Water

Surface water and groundwater entering the excavation or in contact with potentially contaminated materials shall be stored and disposed in accordance with Section 02141 LIQUIDS HANDLING AND DISPOSAL. The Contractor shall minimize the quantity of surface water entering the excavation by constructing stormwater diversion berms or other effective means to divert surface water away from the open excavation.

3.2.5 Removal and Transport of Water

The Contractor is responsible for the removal and transport of all water entering the excavation resulting from direct precipitation, site runoff, groundwater seepage, perched water, etc. The Contractor shall handle this water in accordance with Section 02141: LIQUIDS HANDLING AND DISPOSAL.

3.2.6 CWM Stormwater Management Area/Permitted Discharge Point

The Contractor shall remove the ponded water that is backed up behind CWM's permitted stormwater discharge point at approximately Station 28+00 prior to excavation and removal of the pipeline between approximately Stations 28+00 and 32+00. The Contractor shall coordinate this activity with CWM. If the discharge of this water for the purpose of proceeding with the pipeline remediation can be coordinated with CWM's scheduled discharge, the Contractor shall coordinate this with CWM. If this cannot be scheduled to accommodate the Contractor's construction remediation schedule, the Contractor shall test the ponded water to determine if the discharge permit requirements are exceeded. If no parameters exceed the permit requirement, then the Contractor can discharge the water through the permitted discharge point by opening the gate to the culvert. If any parameters are exceeded, the Contractor shall be responsible for treatment and discharge onsite or treatment/disposal at a competitively bid facility in accordance with Section 02141: DEWATERING LIQUIDS AND HANDLING.

The Contractor shall construct temporary berms on both sides of the pipeline excavation in the area of CWM's stormwater management (between approximately Stations 28+00 to 32+00) as shown on the drawings after the ponded water is removed and prior to commencing excavation activities. These berms shall serve to divert stormwater in this area away from the excavation and prevent runoff from the excavation entering into CWM's stormwater management area.

3.3 STAGING AND STOCKPILING OF MATERIALS

3.3.1 Temporary Staging Areas

Temporary on-site staging/stockpiling areas shall be constructed by the Contractor as required to perform the work.

3.3.1.1 Contaminated Material Staging Area

Unless leakage, staining or other visual evidence indicates potentially contaminated soils, it is anticipated that most of the soils above the intact sections of the pipelines and from the excavation sidewalls will be below the clean-up criteria based on the PRDI. Excavated soils are, however, considered potentially contaminated, and must be handled and stockpiled as such until confirmation and verification sampling have indicated that the soils are below the criteria. The Contractor has the option of field testing the soils overlying the pipeline in accordance with the requirements for verification samples, prior to excavation, or, if contained in lined roll-offs, to determine if the soils may be handled as clean backfill. The Contractor shall segregate soils that show evidence of potential contamination including soils below disturbed (broken, removed, etc.) sections of the pipeline from other excavated soils in order to minimize the soil that will require offsite transportation to a treatment/disposal facility. Excavated soil determined to be below the criteria shall be utilized to the extent possible as clean backfill materials.

The Contractor shall provide as part of the Excavation, Staging and Handling Plan (Excavation Plan) the location, size, liner design and means of liquid collection for the contaminated materials staging area. The Contractor shall describe how the potentially and known contaminated soil and sediment will be transported to the staging area, stockpiled and transferred to containers/vehicle for off-site transport and treatment/disposal. The soil stockpile areas shown on the drawings are suggested locations and are of approximate sized to accommodate the estimated volume of soil to be excavated from the designated complete removal areas. The Contractor may construct other stockpile areas depending on his anticipated excavation and handling production. The Contractor may use lined roll-offs to stockpile excavated soil; however, the roll-offs must be placed within a bermed area in order to collect and analyze any stormwater that may come in contact with contaminated soils. The roll-offs will also require impervious covers to minimize generation of contact waters. The contaminated materials, stockpiling/staging area shall be constructed prior to excavation activities.

Staging areas to receive contaminated material shall be constructed with a liner and drainage collection system to contain all liquids in contact with the contaminated materials and to prevent migration of contaminated soil and sediment. The contaminated material staging area shall consist at a minimum of 40 mil HDPE geomembrane underlain by a nonwoven protective geotextile and overlain by a nonwoven geotextile and aggregate paving surface that will protect the geomembrane from vehicle traffic and material staging damage. The Contractor shall determine the type of surface necessary to support equipment and loading and unloading activities without causing damage to the geomembrane. Liquids collected shall be disposed of in accordance with Section 01241: LIQUIDS HANDLING AND DISPOSAL.

Impervious temporary covers shall be provided in order to minimize the volume of contaminated water generated due to precipitation contacting stockpiled contaminated materials. The covers shall be arranged such that the majority of precipitation is directed to the perimeter of the staging area or to a sump where the water may be discharged by pumping. The Contractor is responsible for securing any necessary permits. The covers shall be placed and secured at the end of each day. An adequate anchoring system shall be provided to prevent uplift due to wind.

The Contractor shall ensure that dissimilar materials do not contact during storage, i.e., contaminated materials which will may be handled and disposed of in different manners. If contaminated materials should contact clean material, the Contractor shall immediately remediate the area.

3.3.1.2 Backfill Material Staging Area

The Contractor shall provide a staging area for stockpiling clean backfill materials. Soils excavated from the pipeline remediation shall be considered potentially contaminated and shall be handled and stockpiled as contaminated material until confirmation sampling indicates these soils are below the clean-up criteria. Confirmation sampling, as specified in Section 02010: CONFIRMATION, VERIFICATION AND POST-INTERIM REMOVAL ACTION SAMPLING, shall be performed at a minimum of every 1,000 cu yd of excavated soil to be used as backfill. The Contractor has the option of conducting the verification and confirmation sampling on soils, from above the pipeline only, prior to excavation or that are contained in lined roll-offs or other suitable containers prior to their transport to the staging areas in order to pre-determine if the soils can be handled as clean backfill or as contaminated soils based on the clean-up criteria. The area shall be constructed so as to prevent the migration of any material. The floor of the staging area shall be constructed of material which will allow loading and unloading operations to continue uninterrupted at all times. Erosion, runoff, and runoff control shall be in all stockpiling areas in accordance with the drawings and Section 01561: ENVIRONMENTAL PROTECTION.

3.3.2 Dust Control

The Contractor shall ensure adequate moisture on all stockpile materials so as to prevent nuisance dust in accordance with Section 01561: ENVIRONMENTAL PROTECTION.

3.3.3 Decommissioning of Staging Areas

Upon completion of excavation and/or backfilling activities the staging areas shall be removed. Staging areas used to stockpile contaminated materials will be dismantled and all components of the area from the bedding geotextile for the impermeable barrier upward shall be disposed of in accordance with Section 02120: TRANSPORTATION AND DISPOSAL OF HAZARDOUS AND NON HAZARDOUS MATERIALS. The subgrade soil below the impermeable barrier and the bedding geotextile shall be sampled (two per stockpile area) and analyzed by the Contractor for explosives, semi-VOCs and PCB in accordance with the method for verification samples (see Tables 02010-1 and 02010-2) as directed by the Contracting Officer. If the results are below the clean-up criteria, the material shall be graded in accordance with the Drawings and covered with 6 inches of topsoil. If any contamination is detected above the clean-up criteria, the upper 6 inches of material shall be removed

and disposed off and re-sampled, as directed by the Contracting Officer, at no additional cost to the Government. The Contractor shall collect soil samples for analysis from the stockpile areas prior to their construction to document existing conditions. If any components can be salvaged, they shall be decontaminated in accordance with Section 02143: DECONTAMINATION OF CONSTRUCTION EQUIPMENT.

Staging areas used to stockpile backfill materials shall be graded in accordance with the drawings and covered with 6 inches of topsoil. All disturbed areas shall be seeded in accordance with Section 02935 TURF.

-- End of Section --

SECTION 02230

REMEDIATION OF PCB-CONTAMINATED PIPELINE LIQUIDS AND SOILS

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Scope of Work

The work to be completed under this section includes removal of accumulated pipeline liquids, sediments, and surrounding soils potentially contaminated with polychlorinated biphenyls (PCBs) from the south TNT pipeline; containment, collection, and temporary storage of liquid and solid (sediment and/or surrounding soils) wastes removed from the pipelines; disposal of removed materials and all wastes generated during the work; and closure of the excavation. The Contractor shall furnish all labor, materials, equipment, and services necessary to complete the work required in the Specifications and as shown on the drawings.

1.2.1 Liquids Release

A release of liquids with an initial oily phase was encountered during investigation of the South TNT pipeline in the Preliminary Remedial Design Investigation (PRDI). A test pit was being excavated at location MH-TP (Sta. 15+89) to investigate the expected tie-in of the AFP-68 chemical waste sewer system to the TNT pipeline at a manhole located just west of Area 22.

Test pit excavation began along the north side of the visible manhole. The test pit was excavated to a depth of approximately 8 ft, where the concrete-encased pipeline entering into the manhole was found. Materials removed from this portion of the test pit included tan fine sandy silt with some bricks, wood, and pieces of broken vitreous clay tile with rubber gaskets. Excavation then proceeded to the southern side of the manhole where the concrete encased pipeline was found intact exiting the manhole. The concrete casing measured 2 ft wide by 3 ft deep, indicating that this was the North TNT line.

Excavation then proceeded to the southeast in order to expose the South line. Materials removed from this portion of the excavation were primarily red-brown silty clay with abundant bricks, wood, and broken clay tiles. The excavation had proceeded approximately 6 ft to the southeast of the North line when, at a depth of approximately 10 ft below ground surface (bgs), a release of oily liquid began rushing into the pit. After unsuccessful initial attempts to plug the flow with excavated soils, a berm was constructed around the pit in order to contain the release. The initial slug of liquid appeared to be oil followed by clearer aqueous liquid. The liquid reached a static level of approximately 1 ft above ground surface within 1 hour.

Subsequent efforts to determine the source of the liquid by pumping and observing possible nearby sources indicated that the probable source of the liquid was the inactive AFP 68 oil/water separator located approximately 250 ft to the southeast across Spruce Street in Area 24 North. The oil/water separator had been previously cleaned by SCA Chemical Services, Inc. (SCA) and presently contained only rainwater. After determining the probable source, the liquid level in the test pit was pumped down

and the test pit backfilled with bentonite and excavated soils. The collected liquid was tested and transported to the Chemical Waste Management (CWM) aqueous treatment facility for treatment.

Subsequent sampling of pipeline liquids downgradient of this point, from an existing manhole at approximately Sta 9+51 (Sta 30+80 in PRDI), demonstrated that the liquid in the North line was clear, but that liquid in the South line contained an oily phase. Analyses for PCBs in these samples showed the presence of Aroclor-1242 in the South pipeline sample at 560 milligrams per kilogram (mg/kg) and 140 mg/kg. No PCBs were detected in the sample from the North pipeline.

All of the outlet lines from the oil/water separator were scheduled to be sealed with cement grout by CWM. The oil/water separator and related discharge lines are not part of this interim removal action. It is possible, however, that a conduit may remain to channel liquids from the area of the oil/water separator to the area of the south TNT line. Residual soil contamination at approximately Sta. 15+80 (PRDI Sta 25+00) from the oil discharge and pipeline liquids in the downgradient section of the pipeline will be remediated in accordance with New York State Department of Environmental Conservation (NYSDEC) soil cleanup criteria as part of this interim removal action. Based upon the data and observations during the PRDI, these materials are suspected of contamination with PCBs.

1.1.3 Work Practices

All work shall be conducted in accordance with the Contractor's Site-Specific Health and Safety Plan.

1.1.4 Surface Preparation

Surface preparation and construction of erosion run-on and runoff controls, to minimize surface water entering the excavation, shall be performed prior to excavation work in each area in accordance with those subsections within Section 01561: ENVIRONMENTAL PROTECTION.

1.1.5 Excavation

Excavation of sumps to access the pipeline, liquids handling in excavations, dust control, soil stockpiling, and backfilling of excavations shall be performed in accordance with Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES.

1.1.6 Decontamination

Decontamination of the pipeline following waste removal and grouting of the pipeline shall be performed in accordance with Section 02228: FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE.

1.2 SUBMITTALS

1.2.1 PCB Remediation Plan

Thirty calendar days following the Notice to Proceed and prior to the Preconstruction Plan Review Conference, the Contractor shall submit for the Contracting Officer's (CO) review a Preliminary PCB Remediation Plan as part of the **Site Operations Plan** for the work in this section to be accomplished. The plan shall include the proposed sequence of operations; method for exposing the contaminated areas and excavating sumps; method for accessing and opening the pipeline; method of removing and temporarily staging pipeline liquids; method for excavating and storing contaminated soil, clean soil, and backfill soil; methods for characterization and disposal of contaminated liquids, sediments, soils, and waste generated during remediation; and methods for flushing and in-place closure of the pipeline

following waste removal, in accordance with Section 02228: FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE. The Contractor shall incorporate all comments received from the CO at the Preconstruction Plan Review Conference and submit a final plan within 30 days after the conference. Remediation shall be performed in accordance with the approved plan and if the required results are not obtained, the Contractor shall revise his plans in writing before changing the work procedures.

PART 2 PRODUCT

RESERVED

PART 3 EXECUTION

3.1 TEST PIT EXCAVATION

The work to be completed under this section includes locating and delineating the former excavation at approximately Sta. 15+80; reopening the previous test pit to access the area of PCB-contaminated soils; containment and collection of liquid that may continue to drain into the pit from the suspected conduit; limited investigation to locate, identify, and plug the conduit, if existing; removal of PCB-contaminated soil/sediment and sludge from the excavation; confirmation sampling and analysis to confirm that cleanup criteria are achieved; disposal of PCB-contaminated soils, sediments, sludges, and liquids; backfill of the excavation; and site restoration. Sections of the TNT pipeline downgradient from Sta. 15+80 will be remediated by flushing and closure in-place in accordance with Section 02228: FLUSHING AND CLOSURE IN-PLACE OF TNT PIPELINE. It may be possible to use the excavation at Sta. 15+80 as an upgradient temporary lined containment sump as specified in Section 02228 following removal of PCB-contaminated media, with backfill and site restoration following pipeline remediation.

3.1.1 Materials, Equipment, and Services

The Contractor shall provide all labor, materials, equipment, and services for the following activities.

3.1.1.1 Test Pit Location

Field location of the approximate limits of the previous test pit at approximately Sta. 15+80. The location and delineation shall be based upon information presented in previous site investigations (PRDI Report and DAR), and as shown in the drawings, as well as field observations of disturbed soil areas and discussions with the CO as appropriate. For planning purpose, the Contractor shall assure a rectangular area 15 ft by 10 ft to be marked.

3.1.1.2 Test Pit Delineation

Delineation of the area to be excavated to remove test pit backfill and access soils contaminated during the previous work. The Contractor shall perform all surveying as necessary for the performance of the work. Surveying to determine quantities shall be performed by an independent surveyor registered in the State of New York. The Contractor shall be responsible for laying out the area to be excavated; providing a survey of the existing surface elevations (topographical survey of area, approximately 25 feet from pipeline centerline, to be excavated for pipeline access); performing any intermediate surveying as needed; performing final survey of excavated depths and dimensions; and providing a final grade survey of backfilled areas.

The Contractor shall coordinate all survey work with the CO prior to and during work activities at the site. The Contractor shall notify the CO when the excavation has been completed and the soils have

been exposed. The Contractor's Surveyor will then survey the area to verify the depths excavated. Additional excavation based on confirmation sampling will be maintained by intermediate surveys until the CO notifies the Contractor that excavation is complete. The Contractor will then survey the areas for final excavated dimensions and depths prior to backfilling. All coordinate and elevation data shall be determined to the nearest 0.01 ft. Horizontal measurements shall be tied into the CWM facility coordinate system. All elevations will be referenced to the National Geodetic Vertical Datum of 1929.

3.1.1.3 Erosion and Sedimentation Controls

Establishment and maintenance of erosion and sedimentation controls and stormwater management controls for all areas to be disturbed.

3.1.1.4 Clearing and Grubbing

Clearing and grubbing, as necessary, of areas requiring excavation. Vegetation/debris shall be disposed of by the Contractor, in accordance with Section 02110: CLEARING AND GRUBBING.

3.1.1.5 Containment

Construction of a temporary soil containment berm around the approximate limits of the previous test pit. The containment berm is intended to capture any liquids that may remain in the suspected conduit and that may drain into the pit upon excavation. The Contractor shall assume the volume of liquids which may drain into the pit to be approximately 900 gallons. Although this volume is not expected to fill the expected excavation, the temporary berm is intended to provide a safety factor against larger quantities of drainage. Soil for construction of the temporary berm may be taken from the initial portions of previously backfilled soils excavated from the pit. If the soils are visibly stained, the berm may be constructed on a temporary liner material to prevent contamination of the underlying clean soils.

3.1.1.6 Excavation

Excavation of backfilled soils from previous test pit. The anticipated excavation limits are approximately 10 ft by 15 ft in surface area and 10 ft in depth. Excavated soils shall be handled and stockpiled in accordance with the procedures in Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINE. Soils suspected of PCB contamination shall be segregated from other contaminated soils for separate disposal.

3.1.1.7 Liquids

a. Containment, removal, and containerization of all liquid that enters the excavation. The Contractor shall mobilize to the site and have ready portable pumps and temporary storage equipment sufficient to ensure capture and containment of liquids that may be released from suspected subsurface conduits within the excavation. Upon observing any such release during the excavation, the Contractor shall initiate removal and continue until all liquids are removed. The rate of removal shall be maintained to ensure that the liquid does not overflow the excavation/bermed area and contaminate surrounding areas. The liquids shall be sampled and analyzed to determine specific treatment/disposal requirements. The liquids shall be stored temporarily until the results of analyses are available. All pipeline liquids shall be managed in accordance with Section 02141: DEWATERING LIQUIDS AND HANDLING.

b. Based upon observations during the PRDI, the liquids entering the excavation may exhibit separate oily and aqueous phases. The Contractor shall have available oil/water separation equipment, and if directed by the CO, shall separate the oily and aqueous phases for separate disposal.

3.1.1.8 Pipe Conduit Investigation

Once the liquids have been removed from the excavation, the Contractor shall attempt to locate, expose, and seal the downgradient end of the suspected conduit or pipe from the existing oil/water separator. The upgradient end has previously been sealed by the current owner. The Contractor shall perform a limited investigation by excavation in the direction of the oil/water separator to attempt to locate the pipeline. The Contractor shall assume that this excavation will proceed no more than 15 ft from the excavation in the direction of the oil/water separator, as shown on the drawings. Any pipe(s) encountered in this investigation shall be exposed and sealed by grouting. Soils from this excavation shall be staged and managed with other soils from this effort. The Contractor shall document the observations from this investigation, including sketches, notes, and photographs as necessary to document the presence of any conduits encountered.

3.1.1.9 Removal of Potentially Contaminated Soils from the Excavation

Soils may exhibit contamination from contact with liquids released during the PRDI test pit excavation or during this remedial effort. The initial excavation shall comprise a 12-inch lift of soils from the walls and floor of the excavation, or to the depth of visible staining. Confirmation and verification sampling, and additional soil removal as necessary, shall then proceed in accordance with Subsection 3.1.1.1.5 of Section 2010: CONFIRMATION AND VERIFICATION SAMPLING. This procedure shall be repeated until sampling and analysis demonstrates that cleanup criteria have been achieved.

3.1.1.10 Temporary Sump Construction

If the excavation at approximately Sta. 15+80 is determined to be suitable as an upgradient sump location for flushing and closure of the TNT pipeline, the Contractor shall, following removal of contaminated soils, proceed to construct a temporary sump and remediate the TNT pipeline in accordance with Section 02228: FLUSHING AND CLOSURE IN PLACE OF TNT PIPELINE. Pipeline liquids downgradient of Sta. 15+80 may be under pressure from gravity level and may contain PCBs and should be handled accordingly.

3.1.1.11 Backfilling and Grading

Following verification that cleanup criteria have been achieved, other remediation activities as necessary for the remaining TNT pipeline, backfilling and restoration of the excavation, shall be completed in accordance with Section 02210: BACKFILLING AND GRADING FOR REMEDIATION AREAS.

3.1.1.12 Disposal of Excavated Materials

The Contractor is responsible for the containerization and transport to a designated treatment/disposal facility of excavated materials, including but not limited to soils, sediments, sludges, liquids, and pipeline materials, that contain contaminants that exceed the cleanup criteria. PCB-contaminated materials shall be managed and disposed in accordance with requirements of the Toxic Substance Control Act (TSCA) and all other applicable laws and regulations. The Contractor shall dewater and stabilize the sediments and sludges according to the treatment/disposal facility requirements.

3.1.1.13 Excavated Materials Transportation

The Contractor will arrange for transportation of contaminated soils, sediments, sludge, and liquids from the remediation site to the treatment/disposal facilities. The Contractor shall coordinate disposal truck traffic to and from the excavation areas to ensure easy flow of traffic through the site that will not interfere with site activities and CWM's RCRA TSDF facility operation. The Contractor is responsible

for the construction, maintenance, and ultimate removal of temporary construction access roads. The Contractor is responsible for maintaining access roads, within the exclusion zone to be used by off-site transport vehicles, clean of known or potentially contaminated materials. Restricted traffic and temporary liners shall be used to maintain these access road clean. The construction exits shall be maintained to keep the site access roads free of soil and sediment.

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

~~DEPARTMENT OF THE ARMY~~
~~U.S. ARMY CORPS OF ENGINEERS~~

CEGS-02241 (April 1992)

Superseding
CEGS-02241 (February 1989)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~

~~Includes changes through Notice 4 (December 1995)~~

~~Latest Notice change indicated by \&\ tokens~~

SECTION 02241 AGGREGATE BASE COURSE 04/92

~~NOTE: This guide specification covers the requirements for base course for roads and streets and for airfield pavements designed for light loads, Type B and C traffic areas for medium loads, overruns, and Type D traffic area. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.~~

PART 1 GENERAL

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 29	(1991a) Unit Weight and Voids in Aggregate
ASTM C 127	(1988; R 1993) Specific Gravity and Absorption of Course Aggregate
ASTM C 128	(1993) Specific Gravity and Absorption of Fine Aggregate

ASTM C 131	(1989) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	\\(1995a)& Sieve Analysis of Fine and Coarse Aggregates
ASTM D 75	(1987; R 1992) Sampling Aggregates
ASTM D 422	(1963; R 1990) Particle-Size Analysis of Soils
ASTM D 1556	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2922	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1993) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM E 11	\\(1995)& Wire-Cloth Sieves for Testing Purposes

1.2 UNIT PRICE

~~NOTE: Paragraphs Measurement for Payment and Basis for Payment will be deleted when lump-sum payment is desired.~~

1.2.1 Measurement for Payment

~~NOTE: Method of measurement not applicable to job conditions will be deleted.~~

[The quantity of aggregate base course completed and accepted as determined by the Contracting Officer will be measured in ~~{square meters. (yards.)}~~ [cubic meters. (yards.)] ~~{metric tons (2000 pound tons)}~~ of aggregate

used in the accepted work.]] [The volume of aggregate base course in-place and accepted will be determined by the average job thickness specified and the dimensions indicated.]

1.2.2 Basis for Payment

Payment for aggregate base course on the tonnage basis will be allowed if more economical than the square meter (yard) or cubic meter (yard) basis. Payment for aggregate base course, constructed and accepted, will be made at the respective contract unit price in the unit price schedule. No payment will be made for any material wasted, used for the convenience of the Contractor, unused or rejected, or for water used.

1.3 DEFINITIONS

1.3.1 Aggregate Base

Aggregate base as used herein is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.

1.3.2 Degree of Compaction

Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated hereinafter as percent laboratory maximum density.

1.4 GENERAL

The work specified herein consists of the construction of an aggregate base course. The work shall be performed in accordance with this specification and shall conform to the lines, grades, notes and typical sections shown in the plans. Sources of all materials shall be selected well in advance of the time that materials will be required in the work.

1.5 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

1.5.1 SD-01 Data

Plant, Equipment, Machines, and Tools; [FIO].

List of proposed equipment to be used in performance of construction work including descriptive data.

1.5.2 SD-09 Reports

Sampling and Testing; [GA]. Field Density; [GA].

Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within {24} [] hours after the tests are performed. Certified copies of test results for approval not less than {30} [] days before material is required for the work.

1.5.3 SD-18 Records

Waybills and Delivery Tickets; [FIO]. Coarse Aggregate; [FIO].

Copies of waybills and delivery tickets during the progress of the work. Certified waybills and delivery tickets for all materials actually used. A notification stating which type of coarse aggregate is to be used.

1.6 WAYBILLS AND DELIVERY TICKETS

~~NOTE: This paragraph will be deleted when lump sum payment is desired.~~

Copies of waybills or delivery tickets shall be submitted during the progress of the work. Before the final payment is allowed, waybills and certified delivery tickets shall be furnished for all aggregates actually used in the construction.

1.7 WEATHER LIMITATIONS

Base shall not be constructed when the atmospheric temperature is less than 2 degrees C. (35 degrees F.) Base shall not be constructed on subgrades that are frozen or contain frost. If the temperature falls below 2 degrees C, (35 degrees F,) completed areas shall be protected against any detrimental effects of freezing.

1.8 PLANT, EQUIPMENT, MACHINES, AND TOOLS

1.8.1 General Requirements

Plant, equipment, machines, and tools used in the work shall be subject to approval and shall be maintained in satisfactory working condition at all times. Other compacting equipment may be used in lieu of that specified, where it can be demonstrated that the results are equivalent. The equipment shall be adequate and have the capability of producing the results specified.

1.8.2 Steel-Wheeled Rollers

Steel-wheeled rollers shall be the self-propelled type weighing not less than ~~9 metric tons, (10 tons,)~~ with a minimum weight of ~~135 kilograms per millimeter (300 pounds per inch)~~ width of rear wheel. Wheels of the rollers shall be equipped with adjustable scrapers. The use of vibratory rollers is optional.

1.8.3 Pneumatic-Tired Rollers

NOTE: Types of equipment specified but not required in this type of base course will be deleted, and other items of equipment not listed will be added as appropriate.

Pneumatic-tired rollers shall have four or more tires, each loaded to a minimum of ~~13,600 kilograms~~ (30,000 pounds) and inflated to a minimum pressure of ~~1035 kPa~~ (150 psi.) The loading shall be equally distributed to all wheels, and the tires shall be uniformly inflated. Towing equipment shall also be pneumatic-tired.

1.8.4 Mechanical Spreader

Mechanical spreader shall be self-propelled or attached to a propelling unit capable of moving the spreader and material truck. The device shall be steerable and shall have variable speeds forward and reverse. The spreader and propelling unit shall be carried on tracks, rubber tires, or drum-type steel rollers that will not disturb the underlying material. The spreader shall contain a hopper, an adjustable screen, and outboard bumper rolls and be designed to have a uniform, steady flow of material from the hopper. The spreader shall be capable of laying material without segregation across the full width of the lane to a uniform thickness and to a uniform loose density so that when compacted, the layer or layers shall conform to thickness and grade requirements indicated. The Contracting Officer may require a demonstration of the spreader prior to approving use in performance of the work.

1.8.5 Sprinkling Equipment

Sprinkling equipment shall consist of tank trucks, pressure distributors, or other approved equipment designed to apply controlled quantities of water uniformly over variable widths of surface.

1.8.6 Tampers

Tampers shall be of an approved mechanical type, operated by either pneumatic pressure or internal combustion, and shall have sufficient weight and striking power to produce the compaction required.

1.8.7 Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one ~~[3.05] [3.66] meter~~ (~~[10] [12] foot~~) (~~[10] [12] foot~~) straightedge for each bituminous paver, for use in the testing of the finished surface. Straightedges shall be made available for Government use. Straightedges shall be constructed of aluminum or other lightweight metal and shall have blades of box or box-girder cross section with flat bottom reinforced to ensure rigidity and accuracy. Straightedges shall have handles to facilitate movement on pavement.

1.9 STOCKPILING MATERIALS

~~Materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at locations designated. Before stockpiling of material, storage sites shall be cleared, and sloped to drain. Materials obtained from different sources shall be stockpiled separately. Materials shall be stockpiled in accordance with Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES 02226 EXCAVATION, STAGING AND CONTAINERIZATION OF CONTAMINATED SOILS AND DRUMS Areas A and B.~~

1.10 SAMPLING AND TESTING

1.10.1 General Requirements

~~NOTE: Guidance for preparation of criteria to be used in evaluating laboratory facilities is contained in ASTM E 548.~~

Sampling and testing shall be performed by an approved commercial testing laboratory or by facilities furnished by the Contractor. No work requiring testing shall be permitted until the facilities have been inspected and approved. The first inspection shall be at the expense of the Government. Cost incurred for any subsequent inspection required because of failure of the facilities to pass the first inspection will be charged to the Contractor. Tests shall be performed in sufficient numbers and at the locations and times directed to insure that materials and compaction meet specified requirements. Copies of test results shall be furnished to the Contracting Officer within 24 hours of completion of tests.

1.10.2 Test Results

Results shall verify that materials comply with this specification. When a material source is changed, the new material will be tested for compliance. When deficiencies are found, the initial analysis shall be repeated and the material already placed shall be retested to determine the extent of unacceptable material. All in-place unacceptable material shall be replaced or modified as directed by the Contracting Officer.

1.10.3 Sampling

Aggregate samples for laboratory tests shall be taken in accordance with ASTM D 75.

1.10.4 Sieve Analysis

Before starting work, at least one sample of material shall be tested in accordance with ASTM C 136 and ASTM D 422 on sieves conforming to ASTM E 11. After the initial test, a minimum of one analysis shall be performed for each ~~1000 metric tons~~ (1000 tons) of material placed, with a minimum of ~~one~~ three analyses for each day's run until the course is completed.

1.10.5 Liquid Limit and Plasticity Index

One liquid limit and plasticity index shall be performed for each sieve analysis. Liquid limit and plasticity index shall be in accordance with ASTM D 4318.

1.10.6 Laboratory Density

Tests shall provide a moisture-density relationship for the aggregate. Tests shall be conducted in accordance with ASTM D 1557.

1.10.7 Weight Per Cubic Meter (Foot) of Slag

Weight per cubic ~~meter~~ (foot) of slag shall be determined in accordance with ASTM C 29.

1.10.8 Wear Tests

Wear tests shall be performed in accordance with ASTM C 131. ~~One test shall be run per [] square meter (yards) of completed base course.~~ A minimum of one test per aggregate source shall be run.

PART 2 PRODUCTS

2.1 MATERIALS

~~NOTE: Materials requirement from State or other local highway agency specifications may be incorporated in contract documents for constructing aggregate base course for roads, streets, or similar use pavements if the following conditions are met:~~

- ~~a. Percentage of material by weight passing the 0.075 mm (No. 200) sieve shall not exceed 10.~~
- ~~b. Where local conditions dictate a non frost susceptible material, particles having a diameter of less than 0.02 millimeter shall not exceed 3 percent.~~
- ~~c. Portion of the material passing the 0.425 mm (No. 40) sieve shall have a liquid limit not greater than 25 and a plasticity index not greater than 5.~~
- ~~d. State or other local highway specifications selected for projects requiring not more than 600 cubic meters (750 cubic yards) of material must be approved by the Division Engineer.~~
- ~~e. State or other local highway specifications selected for projects requiring more than 600 cubic meters (750 cubic yards) must be approved by the Chief of Engineers prior to incorporation in the contract documents. A copy of the specifications or proper reference thereto and information regarding traffic conditions and facilities to be paved will be submitted to the HQDA (CEMP ET), with the request for approval.~~
- ~~f. Rounded aggregates (such as river run gravel) generally will not be allowed since they do not provide sufficient interlocking action to produce the desired compaction.~~

2.1.1 Aggregates

Aggregates shall consist of crushed stone or slag, crushed gravel, angular sand, or other approved material. Aggregates shall be durable and sound, free from lumps of clay, organic matter, objectionable coatings, and other foreign material. Material retained on a 4.75 mm (No. 4) sieve shall be known as coarse aggregate and that passing the 4.75 mm (No. 4) sieve shall be known as binder material.

2.1.1.1 Coarse Aggregate

~~NOTE: Selection of the type of coarse aggregate will be the Contractor's option.~~

~~Only one~~ The types of coarse aggregate shall be used on the project shall meet the requirements specified in Part 2.1.3. Coarse aggregates, consisting of angular fragments of uniform density and quality, shall have a percentage of wear not to exceed 50 percent after 500 revolutions when tested in accordance with ASTM C 131. The amount of flat and elongated particles shall not exceed 30 percent. A flat particle is one having a ratio of width to thickness greater than 3, and an elongated particle is one having a ratio of length to width greater than 3.

a. ~~Crushed Gravel:~~ Crushed gravel shall be manufactured from gravel particles 50 percent of which by weight are retained on the maximum size gradation sieve specified.

b. ~~Crushed Stone:~~ Crushed stone retained on each sieve specified shall contain at least 50 percent by weight of crushed pieces having two or more freshly fractured faces with the area of each face being at least equal to 75 percent of the smallest midsectional area of the piece. When two fractures are adjacent, the angle between the planes of the fractures must be at least 30 degrees to count as two fractured faces.

2.1.1.2 Slag

Slag shall be an air-cooled blast-furnace product having a dry unit weight of not less than 1045 kg/cubic meter. (65 pcf.)

2.1.2 Binder Material

NOTE: Aggregate should be nonplastic or as nearly so as possible. Values shown are the absolute maximum allowable values for liquid limit and plasticity index.

Binder material shall consist of screenings, angular sand, or other finely divided mineral matter processed or naturally combined with the coarse aggregate. Liquid-limit and plasticity-index requirements shall apply to any component that is blended to meet the required gradation and shall also apply to the completed course. The portion of any component or of the completed course passing the 0.425 mm (No. 40) sieve shall be either nonplastic or have a liquid limit not greater than 25 and a plasticity index not greater than 5.

2.1.3 Gradation

NOTE: Desired gradation size and maximum aggregate size will be selected. On the basis of local conditions, the percentage passing the 0.075 mm (No. 200) sieve may be further restricted to help control the amount of particles having diameters less than 0.02 millimeter. The frost susceptibility requirement will be deleted in areas where the material is not subject to frost action.

Requirements for gradation specified shall apply to the completed base course. The aggregates shall have a [50][37.5][25] millimeter ([2][1 1/2][1] inch) maximum size and shall be continuously graded within the following limits: meet the requirements of NYSDOT Type 2 Subbase Course, NYSDOT Type 3 for stabilized construction entrance, and AASHTO No. 57 for trench stabilization and other uses as shown on the drawings.

Sieve _____ Percentage by Weight Passing Designation _____ Square mesh Sieve
(a) (b) _____

	No. 1	No. 2	No. 3
50 mm	100		
37.5 mm	70 100	100	
25 mm	45 80	60 100	100
12.5 mm	30 60	30 65	40 70
4.75 mm	20 50	20 50	20 50
2 mm	15 40	15 40	15 40
0.425 mm	5 25	5 25	5 25
0.075 mm	0 10	0 10	0 10

(Sieve _____ Percentage by Weight Passing
Designation _____ Square mesh Sieve (a) (b) _____

	No. 1	No. 2	No. 3
2 inch	100		
1 1/2 inch	70 100	100	
1 inch	45 80	60 100	100
1/2 inch	30 60	30 65	40 70
No. 4	20 50	20 50	20 50
No. 10	15 40	15 40	15 40
No. 40	5 25	5 25	5 25
No. 200	0 10	0 10	0 10

(a) Particles having diameters less than 0.02 millimeter shall not be in excess of 3 percent by weight of the total sample tested.

(b) The values are based on aggregates of uniform specific gravity, and the percentages passing the various sieves are subject to appropriate correction in accordance with ASTM C 127 and ASTM C 128 when aggregates of varying specific gravities are used.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

When the base is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the working area. Line and grade stakes shall be provided as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining.

3.2 OPERATION OF AGGREGATE SOURCES

NOTE: Investigate the availability of Government-owned aggregate source that meets the specification requirement. If none is available, delete material in the first set of brackets.

[Aggregate sources shall be cleared, stripped and excavated to working depths in a manner that produces excavation faces that are as nearly vertical as practicable for the materials being excavated. Strata of unsuitable materials overlying or occurring in the deposit shall be wasted. Methods of operating aggregate sources and the processing and blending of the materials may be changed or modified if necessary to obtain material conforming to the specified requirements. Upon completion of the work, aggregate sources shall be conditioned to drain readily and be left in a satisfactory condition.] [Aggregates shall be obtained from off-site sources.]

3.3 PREPARATION OF UNDERLYING COURSE

NOTE: Reference to the applicable specification section will be retained. Proper compaction of cohesionless materials may be obtained by other methods based on local experience.

The underlying course (backfill) shall be placed in accordance with Section 02210: 02230 BACKFILL AND ROUGH GRADING FOR REMEDIATION AREAS.

3.3.1 General Requirements

Before constructing aggregate base course, the previously constructed underlying course shall be cleaned of foreign substances. Surface of underlying course shall meet the specified compaction and surface tolerances. Subgrade shall conform to ~~[Section 02225 EARTHWORK FOR ROADWAYS, RAILROADS, AND AIRFIELDS]~~ ~~[Section 02210 GRADING]~~. ~~[Subbase course shall conform to [Section 02234 SUBBASE COURSE]~~ ~~[Section 02232 SELECT MATERIAL SUBBASE COURSE]~~.] Section 02210: 0224 BACKFILL AND ROUGH GRADING FOR REMEDIATION AREAS. Ruts or soft, yielding spots that may appear in the underlying course, areas having inadequate compaction, and deviations of the surface from requirements specified shall be corrected. ~~For cohesionless underlying materials containing sands, sand gravels, or any other cohesionless material in harmful quantities,~~ Where wet or unstable areas of subgrade are encountered and with the approval of the Contracting Officer, the surface shall be undercut as required, backfilled, and mechanically stabilized with NYSDOT Type 1A aggregate ~~AASHTO No. 57~~ prior to placement of the aggregate course. Stabilization may be accomplished by mixing ~~base course~~ aggregate material into the underlying course and compacting by approved methods. Alternatively, upon receipt of approval from the Contracting Officer, the Contractor may utilize geotextile filter fabric in conjunction with or in lieu of the aggregate for stabilization purposes. Properly compacted material will be considered as part of the underlying course and shall meet all requirements for the underlying course. Finished underlying course shall not be disturbed by traffic or other operations and shall be maintained in a satisfactory condition until ~~base~~ subsequent courses ~~is~~ are placed.

3.3.2 Grade Control

Underlying material shall be excavated to sufficient depth for the required base course thickness so that the finished base course with the subsequent surface course will meet the fixed grade. Finished and completed area shall conform to the lines, grades, cross section, and dimensions indicated.

3.4 INSTALLATION

3.4.1 Mixing and Placing

~~NOTE: More details of mixing methods will be included if applicable.~~

Materials shall be mixed by the stationary plant, traveling plant, or road mix method and placed in such a manner as to obtain uniformity of the aggregate base course material and at a uniform optimum water content for compaction. The Contractor shall make such adjustments in mixing or placing procedures or in equipment to obtain the true grades, to minimize segregation and degradation, to reduce or accelerate loss or increase of water, and to ensure a satisfactory base course.

3.4.2 Edges of Base Course

Approved material shall be placed along edges of aggregate base course in such quantities as will compact to thickness of the course being constructed, or to the thickness of each layer in a multiple layer course, allowing in each operation at least a ~~300 mm~~ (1 foot) width of the shoulder to be rolled and compacted simultaneously with rolling and compacting of each layer of base course.

3.4.3 Compaction

~~NOTE: Appropriate percentage will be inserted.~~

Each layer of aggregate base course ~~including shoulders~~ shall be compacted. Water content shall be maintained at optimum or at a water content for which the required degree of compaction is achievable. Density of compacted mixture shall be at least ~~95~~ ~~100~~ ~~percent~~ ~~of laboratory maximum density~~. Rolling shall begin at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. Speed of the roller shall be such that displacement of the aggregate does not occur. Areas inaccessible to the rollers shall be compacted with mechanical tampers, and shall be shaped and finished by hand methods.

3.4.4 Layer Thickness

Compacted thickness of the aggregate course shall be {as indicated} ~~[[] millimeter. (inches.)]~~ No layer shall be in excess of ~~200 mm~~ (8 inches) nor less than ~~75 mm~~ (3 inches) in compacted thickness.

3.4.5 ~~(Proof Rolling)~~ OMITTED

~~NOTE: Drawings should be checked to ensure that any supplementary information required by the paragraph has been shown and that there is no conflict between the drawings and the specifications.~~

~~When aggregate base course is used in medium load airfield runway pavement construction, this paragraph will be retained; when used otherwise, references to proof rolling will be deleted unless it is specifically required by the design engineer.~~

~~*****~~

~~Proof rolling of the areas indicated shall be in addition to the compaction specified and shall consist of the application of 30 coverages with a heavy pneumatic tired roller having four or more tires, each loaded to a minimum of 13,600 kg (30,000 pounds) and inflated to a minimum of 1035 Kpa. (150 psi.) In areas designated, proof rolling shall be applied to the top lift or layer on which base course is laid and to each layer of base course. Water content of the top lift or layer on which base course is laid shall be maintained at optimum or at percentage directed from start of compaction to completion of proof rolling of that layer. Water content of each layer of the base course shall be maintained at the optimum percentage directed from start of compaction to completion of proof rolling. Materials in base course or underlying materials that produce unsatisfactory results by rolling shall be removed and replaced with satisfactory materials and recompact.~~

3.4.6 Finishing

The surface of the top layer shall be finished to grade and cross section shown. Finished surface shall be of uniform texture. Light blading during compaction may be necessary for the finished surface to conform to the lines, grades, and cross sections. Should the surface for any reason become rough, corrugated, uneven in texture, or traffic marked prior to completion, such unsatisfactory portion shall be scarified, reworked, recompact, or replaced as directed.

3.4.6.1 Smoothness

Surface of each layer shall show no deviations in excess of ~~9.5 mm (3/8 inch)~~ (3/8 inch) when tested with the ~~{3.05} {3.66} meter {10} {12} foot~~ (10-) {12-} foot)-straightedge. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting, as directed.

3.4.6.2 Thickness Control

~~*****~~

~~NOTE: When aggregate base courses are constructed less than 150 mm (6 inches) in total thickness, a deficiency of 10 mm (1/2 inch) in thickness of any area of such paving is considered excessive. Applicable to job conditions, the thickness tolerance provisions may be modified as required, restricting all deficiencies to not over 5 mm (1/4 inch).~~

~~*****~~

Compacted thickness of the base course shall be within ~~12.7 mm (1/2 inch)~~ (1/2 inch) of the thickness indicated. Where the measured thickness is more than ~~12.7 mm (1/2 inch)~~ (1/2 inch) deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, reblading, and recompact as directed. Where the measured thickness is more than ~~12.7 mm (1/2 inch)~~ (1/2 inch) thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within ~~7 mm (1/4 inch)~~ (1/4 inch) of the thickness indicated.

3.5 FIELD QUALITY CONTROL

3.5.1 Field Density

Field in-place density shall be determined in accordance with ~~[ASTM D 1556]~~ ~~[ASTM D 2167]~~ [ASTM D 2922]. When ASTM D 2922 is used, the calibration curves shall be checked, and adjusted if necessary, using the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil, and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 at least once per lift for each ~~5000~~ ~~[]~~ square ~~meter~~ (yard) of base material. Calibration curves and calibration test results shall be furnished within 24 hours of the conclusion of the tests. At least one field density test shall be performed for each ~~[250]~~ ~~[]~~ square ~~meters~~ (yards) of each layer of base material.

3.5.2 Smoothness

Measurements for deviation from grade and cross section shown shall be taken in successive positions parallel to the road centerline with a ~~&[3]~~ ~~[3.5]~~ meter ~~((10)~~ ~~[12]~~ foot)~~&~~ straightedge. Measurements shall also be taken perpendicular to the road centerline at ~~[15]~~ ~~[]~~ meter ~~&((150)~~ ~~[]~~ ~~100~~ foot)~~&~~ intervals.

3.5.3 Thickness

Thickness of the base course shall be measured at intervals in such a manner as to ensure one measurement for each ~~[200]~~ ~~[]~~ square ~~meters~~ (yards) of base course. Measurements shall be made in ~~&75 mm~~ (3 inch) ~~(3 inch)~~ & diameter test holes penetrating the base course.

3.6 TRAFFIC

Completed portions of the area may be opened to traffic, provided there is no marring or distorting of the surface by the traffic. Heavy equipment shall not be permitted except when necessary to construction, and then the area shall be protected against marring or damage to the completed work.

3.7 MAINTENANCE

The aggregate base course shall be maintained in a satisfactory condition until accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact.

3.8 DISPOSAL OF UNSATISFACTORY MATERIALS

Removed in-place materials that are unsuitable for the base course material that is removed for the required correction of defective areas, and waste material and debris shall be disposed of ~~[as directed]~~ ~~[in waste disposal areas indicated]~~.

-- End of Section --

~~DEPARTMENT OF THE ARMY~~
~~U.S. ARMY CORPS OF ENGINEERS~~

~~GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION~~

SECTION 02271
GEOMEMBRANE BARRIER FOR ~~STAGING AREAS~~ LANDFILL COVER
11/93

~~NOTE: This guide specification covers the requirements for \@construction of a geomembrane barrier for a landfill cover@\.. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110 345 720.~~

PART 1 GENERAL

~~NOTE: See Additional Notes A and B~~

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|-------------|---|
| ASTM D 638 | (1989) Test Method for Tensile Properties of Plastics |
| ASTM D 746 | (1987) Test Method for Brittleness Temperature of Plastics and Elastomers by Impact |
| ASTM D 751 | (1989) Standard Methods of Testing Coated Fabrics |
| ASTM D 1004 | (1988) Test Method for Initial Tear Resistance of plastic Film and Sheet |
| ASTM D 1238 | (1982) Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer. |

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ASTM D 1505	(1968) Test Method for Density of Plastics by the Density-Gradient Technique.
ASTM D 1603	(1976) Test Method for Carbon Black in Olefin Plastics.
ASTM D 4354	Sampling of Geosynthetics for Testing.
ASTM D 1593	(1989) Specification for Nonrigid Vinyl Chloride Plastic Sheet
ASTM D 1693	(1988) Test Method for Environmental Stress Cracking of Ethylene Plastics
ASTM D 4437	(1988) Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes
ASTM D 5199	Measuring Normal Thickness of Geotextiles and Geomembranes
ASTM D 3015	(1972) Recommended Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds.
ASTM D 5321	(1993) Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method

NATIONAL SANITATION FOUNDATION (NSF)

NSF Standard 54	(1991) Standard for Flexible Membrane Liners
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GEOSYNTHETIC RESEARCH INSTITUTE (GRI)

GRI GM4	(1991) Three Dimensional Geomembrane Tension Test
GRI GM7	(1991) Accelerated Curing of Geomembrane Test Strip Seams Made by Chemical Fusion Methods

FEDERAL TEST METHOD STANDARDS (FTMS)

FTMS 101 C 2065.1	Puncture Resistance and Elongation Test
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1.2 MEASUREMENT OMITTED

NOTE: Delete paragraphs MEASUREMENT and PAYMENT when lump sum bidding is used.

~~Measurement will be made of the total surface area in square $\sqrt{\text{meters}}$ $\sqrt{\text{feet}}$ covered by geomembrane. Final quantities will be based on as built conditions. Allowance will be made for geomembrane in anchor and drainage trenches; however, no allowance will be made for waste or overlap.~~

1.3 PAYMENT

~~Geomembrane installed and accepted by the Contracting Officer will be paid for at the respective contract unit price in the bidding schedule. Incidental item.~~

1.4 QUALIFICATIONS:**1.4.1 Manufacturer.**

The manufacturer is the corporation hired by the Contractor who is responsible for producing the geomembrane sheets. Manufacturer shall have produced the proposed geomembrane sheets for at least five completed projects having a total minimum area of $\sqrt{[186,000]}$ [] square meters $\sqrt{\text{two}}$ [5] million square feet.

1.4.2 Fabricator Omitted.

~~The fabricator is the corporation hired by the Contractor who is responsible for seaming geomembrane sheets into panels. Fabricator shall have fabricated the proposed geomembrane panels for at least five completed projects having a total minimum area of $\sqrt{[186,000]}$ [] square meters $\sqrt{\text{two}}$ [] million square feet.~~

1.4.3 Installer.

The installer is the person or corporation hired by the Contractor who is responsible for field handling, deploying, seaming, and anchoring, and field quality control testing of the geomembrane. The installer shall have installed the proposed geomembrane material for at least five completed projects having a total minimum area of $\sqrt{[186,000]}$ [] square meters $\sqrt{\text{two}}$ 5 million square feet. At least one seamer shall have experience seaming a minimum of $\sqrt{[46,500]}$ [] square meters $\sqrt{[500,000]}$ [1,000,000] square feet of the proposed geomembrane using the same type of seaming equipment and geomembrane mil thickness specified for this project. Due to the nature of this project, the Contractor shall be permitted to deploy the geomembrane. If seaming is required, the Contractor shall employ a seamer acceptable to the Contracting Officer.

1.4.4 Omitted Inspector.

~~The Inspector is the third-party quality assurance person or corporation hired by the Contractor, independent from the manufacturer, fabricator, and installer, who is responsible for monitoring and documenting activities related to the quality assurance of the geomembrane from manufacturing through installation. Inspector shall have provided quality assurance inspection during installation of the proposed geomembrane material for at least five completed projects having a total minimum area of $\sqrt{[186,000]}$ [] square meters $\sqrt{\text{two}}$ [] million square feet.~~

1.4.5 Omitted Independent Laboratory.

~~The Independent Laboratory is the third-party quality assurance laboratory hired by the Contractor, independent from the manufacturer, fabricator, and installer who is responsible for laboratory quality assurance geomembrane testing. Independent Laboratory shall have provided quality control and/or~~

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quality assurance testing of the proposed geomembrane seams for at least five completed projects having a total minimum area of $\sqrt{186,000}$ [] square meters $\sqrt{\sim}$ [two] [] million square feet.

1.5 SUBMITTALS:

Government approval is required for submittals with a "GA" designation, submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with SECTION 013050, ~~CONTRACTOR SUBMITTAL PROCEDURES~~ SUBMITTAL DESCRIPTIONS:

NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required. Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.

SD-01 Data

1.5.1 Materials. FIO.

Manufacturer's certified raw material and sheet material data sheets along with a copy of quality control certificates.

SD-04 Drawings

Layout and Detail Drawings:

Geomembrane panel layout and penetration detail drawings a minimum of 30 days prior to delivery of geomembrane to the site.

As-built Drawings:

Final as-built drawings of geomembrane installation showing panel/sheet numbers, seam numbers, and location of patches, destructive seam samples, and penetrations.

SD-06 Instructions

1.5.2 Tests, Inspections, and Verifications. FIO

Manufacturer's quality control (QC) manual. Fabricator's quality control manual.

1.5.3 Field Seaming. FIO

Installer's quality control (QC) manual.

SD-08 Statements

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~~Qualifications:~~

~~Manufacturer's, fabricator's, Installer's, Inspector's, and Independent Laboratory's qualification statements including resumes of key personnel involved in the project.~~

1.5.4 Warranty. FIO

~~Warranty for geomembrane material.~~

1.5.5 Surface Preparation Acceptance. FIO

~~Installer's form for completing and signing to accept prepared subgrade for geosynthetics installation.~~

~~SD-09 Reports~~

Tests, Inspections, and Verifications.

~~Certified laboratory interface friction test results including description of equipment and test method. Manufacturer's certified quality control test results. Fabricator's certified quality control test results.~~

Field Seaming:

~~Installer's certified quality control test results.~~

~~Tests, Inspections, and Verifications; [] One $\sim 31\text{ cm} \sim$ $\sim 12\text{ inch} \sim$ by $\sim 31\text{ cm} \sim$ $\sim 12\text{ inch}$ minimum size geomembrane sample.~~

1.6 DELIVERY, STORAGE AND HANDLING:

~~Geomembrane shall not be off loaded unless the Inspector is present. The geomembrane shall be protected from puncture, abrasion, excessive heat or cold, material degradation, adhesion of individual layers or other damaging circumstances. Damaged geomembrane shall be removed from the site.~~

1.7 WEATHER LIMITATIONS:

~~Geomembrane shall be deployed and field-seamed only when the geomembrane is dry and winds are low. In marginal conditions, seaming shall cease unless tests confirm that satisfactory seam strengths are being obtained. Cold weather seaming techniques shall conform to Installer's quality control manual.~~

1.8 WARRANTY

~~Written warranties for geomembrane material and installation workmanship shall be submitted. The manufacturer's warranty shall state that the installed material meets all requirements of the Contract Documents and that under typical local atmospheric conditions, the sheet material is warranted for 20 years. The Installer's warranty shall state that the geomembrane field seams will not fail within 20 years of the installation.~~

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NOTE: Several manufacturers should be contacted to determine what length of warranty is available for geomembrane material and installation.

1.9 EQUIPMENT

All equipment used in performance of the work shall be in accordance with the geomembrane Manufacturer's recommendations and shall be maintained in satisfactory working condition.

PART 2 PRODUCTS:

2.1 MATERIALS:

2.1.1 High-Density Polyethylene Geomembrane

The Contractor shall supply a 40-mil high-density polyethylene geomembrane or approved equivalent.

2.1.2 Geomembrane Stockpile Covers

Geomembrane material used as a stockpile cover shall either be unreinforced polyethylene (min. 10-mil thickness) or reinforced polyethylene (min. 6-mil thickness).

2.1.1 Raw Materials.—

~~Resin used in manufacturing polyethylene geomembranes shall have a broad molecular weight distribution, a density of less than 0.910 g/cc and no more than 6% of a higher density resin added which is a carrier for the required 2 to 3% carbon black. Textured materials shall contain no more than 7% by weight of carbon black and additives. In addition, resins shall not contain fatty acid residues, epoxy, or secondary plasticizers. Materials which have been used previously will not be allowed. The materials used to manufacture geomembrane sheets shall contain no more than 2 percent regrind ingredients that originate from the same formulation and the same production lot and which are clean and free of any foreign contaminants.~~

2.1.2 Sheet Materials.—

~~A sheet is defined as a manufactured seamless geomembrane unit with a width equal to or greater than 1.5 meters (5 feet). Geomembrane sheets shall be non-reinforced and uniform in color, thickness, and surface texture. For slopes greater than or equal to 1 V on 2 H, sheets shall be textured on one face both faces. The textured surface features shall consist of polymers identical to that of the base material. The sheets shall also be free of and resistant to fungal or bacterial attack and they shall be free of cuts, abrasions, holes, blisters, contaminants and other imperfections.~~

2.1.3 Geomembrane Physical Properties.—

~~Sheets and factory seams shall conform to the minimum physical requirements listed in NSF STANDARD 54 and Table 1. Test values shown in Table 1, except when specified as minimum or maximum, are typical test values. If materials are not included in NSF STANDARD 54, manufacturer's~~

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property specifications shall be substituted. Manufacturer's property specifications shall be submitted a minimum of 30 [] days prior to delivery of geomembrane to the site.

NOTE: The recommended minimum nominal geomembrane thickness is 1.02 mm (40 mils) based on constructibility and survivability. The need for a textured versus a non-textured material will be based on cover stability analyses. Specific limits of textured and non-textured geomembranes must be shown on the Contract drawings.

TABLE 1. GEOMEMBRANE PHYSICAL PROPERTIES

PROPERTY	TEST METHOD		TEST VALUE	
	TEXT	NON TEXT	TEXT	NON TEXT
Thickness, mm, (nominal)	[1.02] []	[1.02] []		
Thickness, mm, (minimum)	ASTM D 1593 [1.02] []	[.91] []		
Tensile Strength at Break, kN/m width	ASTM D 638 [7.9] []	[16.1] []		
Elongation at Break, percent	ASTM D 638 [300] []	[350] []		
Multi-axial Tensile Strain at rupture, percent, (minimum)	GRI GM4 [20] []	[20] []		
Tear Resistance, N	ASTM D 1004 [44.5] []	[44.5] []		
Puncture Resistance, N	FTMS 101C [133.4] []	[244.6] []		
Environmental Stress Crack, hours (minimum)	ASTM D 1693 [1500] []	[1500] []		
Low Temperature Brittleness, degrees C	ASTM D 746 [32] []	[32] []		
Seam Shear Strength, kN/m width	ASTM D 4437 [5.3] []	[6.1] []		

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(minimum). Note 1

Seam Peel Adhesion, ASTM D 4437 [3.5] [] [6.1] []
kN/m width,
(minimum). Note 2

Note 1: Test results shall be considered passing if the minimum shear strength value is reached or the geomembrane elongates greater than 30.5 cm without failing regardless of the shear strength value.

Note 2: Seams tested for peel adhesion must fail in the Film Tear Bond mode. This is a failure in the ductile mode of one of the bonded sheets by tearing or breaking prior to complete separation of the bonded area. Where applicable, both tracks of a double hot wedge seam shall be tested for peel adhesion. ^\

TABLE 1. GEOMEMBRANE PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TEST VALUE
Gauge, nominal	ASTM D 5199	40 mils
Thickness, minimum	ASTM D 5199	36 mils
Density, maximum	ASTM D 1505	0.91 g/cc
Melt Index, maximum	ASTM D 1238	1.0 g/10 minutes
Carbon Black Content	ASTM D 1603	2-3%
Carbon Black Dispersion	ASTM D 3915	A-1, A-2, or B-1
Tensile Properties, Minimum	ASTM D 638	
1. Tensile Strength @ Break	Type IV Specimen	75 lb/in. width
2. Elongation @ Break	@ 20 in./minute	300%
Tear Resistance, minimum	ASTM D 1004, Die C	24 lb
Puncture Resistance, minimum	FTMS 101C 2065.4	56 lb
Asi Symmetric Strain, minimum	GRI CM 4	25%
	TEXT.	NON TEXT.
Thickness, mils, (nominal)	[40] [] [40] []	

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Thickness, mils, ~~ASTM D 1593 [40] [] [36] []~~
(minimum)

Tensile Strength at ASTM D 638 [45] [] [92] []
Break, lbs./in. width

Elongation at Break, ~~ASTM D 638 [300] [] [350] []~~
percent

Multi axial Tensile GRI GM4 [20] [] [20] []
Strain at rupture,
percent, (minimum)

Tear Resistance, ~~ASTM D 1004 [10] [] [10] []~~
lbs. ~~Die C~~

Puncture ~~FILM~~ [30] [] [55] []
Resistance, lbs. ~~2065.1~~

Environmental ~~ASTM D 1693 [1500] [] [1500] []~~
Stress Crack,
hours (minimum)

Low Temperature ~~ASTM D 746 [25] [] [25] []~~
Brittleness,
degrees F

Seam Shear Strength, ~~ASTM D 4437 [30] []~~
lbs./in. width
(minimum). Note 1, 2

Seam Peel Adhesion, ~~ASTM D 4437 [20] []~~
lbs./in. width,
(minimum). Note 2, 3

Note 1: Test results shall be considered passing if the minimum shear strength value is reached or the geomembrane elongates greater than 12 inches without failing regardless of the shear strength value.

Note 2: Seams tested for peel adhesion must fail in the Film Tear Bond mode. This is a failure in the ductile mode of one of the bonded sheets by tearing or breaking prior to complete separation of the bonded area. Where applicable, both tracks of a double hot wedge seam shall be tested for peel adhesion.

Note 3: Seam specimens shall be die cut and 1 inch wide with a grip separation of 4 inches plus the width of the seam. The grip separation rate shall be 20 inches/minute.

2.1.4 Factory Seams. ~~Omitted.~~

~~Geomembrane sheets shall be manufactured as wide as possible to minimize factory and field seams. Manufactured non-polyethylene sheets shall be factory seamed into maximum sized panels so as to minimize field seaming. Panels are factory or field fabricated geomembrane units which are composed of several geomembrane sheets seamed together. Factory seaming shall be by methods approved by the geomembrane manufacturer. Seams shall meet the minimum shear and peel strength requirements shown in Table 1. Factory seams shall extend to the end of the sheet so that no unbonded edges greater than $\sqrt{3.2 \text{ mm}}$ $\sqrt{1/8 \text{ inch}}$ wide are present (top side only).~~

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS:**2.2.1 Interface Friction Testing. ~~Omitted.~~**

~~Laboratory interface friction tests shall be conducted on all [cover] [] system interfaces using ASTM D 5321. Normal stresses of $\sqrt{13.8}$ [], $\sqrt{27.6}$ [], and $\sqrt{41.4}$ [] kPa $\sqrt{2.0}$ [], $\sqrt{4.0}$ [], and $\sqrt{6.0}$ [] psi along with a displacement rate of $\sqrt{.10}$ [] cm $\sqrt{.04}$ [] inches per minute shall be used. Cover system soil components shall be compacted to the same moisture density requirements specified for full scale field placement and saturated prior to shear. Geosynthetics shall be oriented such that the shear force is parallel to the downslope orientation of these components in the field. A minimum interface friction angle of [] degrees is required between all cover system components. Results shall be submitted and approved prior to delivery of cover system geosynthetics.~~

NOTE: See Additional Note D

2.2.2 Manufacturing, Sampling, and Testing:**2.2.2.1 Resin Materials.**

~~Resin shall be tested in accordance with the approved geomembrane manufacturer's quality control manual. Any resin which fails to meet the geomembrane manufacturer's specified physical properties shall not be accepted for manufacturing the sheet. Polyethylene seaming rod and pellets shall be manufactured of resin which is essentially identical to that used in the geomembrane sheet. Seaming rods and pellets shall be tested for density, melt index and carbon black content in accordance with the approved geomembrane manufacturer's quality control manual. Seaming rods and pellets which fail to meet the corresponding property values required for the sheet material, shall be rejected.~~

2.2.2.2 Geomembrane Sample.

~~One $\sqrt{31 \text{ cm}}$ $\sqrt{12 \text{ inch}}$ by $\sqrt{31 \text{ cm}}$ $\sqrt{12 \text{ inch}}$ minimum size geomembrane sample, along with appropriate identification, shall be provided for quality assurance testing and permanent record of actual furnished material. Samples not meeting the minimum requirements specified shall result in the rejection of the applicable sheets.~~

2.2.2.3 Multiaxial Tensile Test.

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~~As a minimum, one multi-axial tensile test shall be run per $\sqrt{[9,300]}$ [] square meters $\sqrt{[100,000]}$ [] square feet of geomembrane used. Testing shall be conducted prior to installation in accordance with GRI GM4.~~

~~NOTE: Multi-axial tensile tests simulate voids beneath the cover. If this is not a concern, delete requirements for multi-axial testing here and in Table 1.~~

2.2.3 Fabrication, Sampling, and Testing. ~~Omitted~~

2.2.3.1 General

~~Prior to or during factory seaming, roll goods shall be visually inspected on both sides for defects and impurities. Defects and impurities shall be removed and repaired prior to completion of the fabrication process. Thickness measurements shall be made at the center and each edge of the beginning and end of each roll of material in accordance with ASTM D 1593. Rolls having a thickness less than the value specified herein shall be rejected.~~

2.2.3.2 Non-Destructive Factory Seam Testing

~~Non-destructive seam testing shall be conducted in accordance with the fabricator's approved quality control manual. Continuous visual inspection shall be performed on the seams during fabrication. Defective seams shall be repaired, retested and approved prior to continuation of the seaming process.~~

2.2.3.3 Destructive Factory Seam Testing

~~During fabrication, a minimum of one destructive test sample shall be taken per $\sqrt{[230]}$ [] meters $\sqrt{[750]}$ [] feet of factory seam length. Where possible, these samples shall be taken from extra material at the beginning or end of panel seams such that the panel is not damaged and the panel geometry is not altered. The samples shall be a minimum of $\sqrt{31}$ cm $\sqrt{12}$ inches wide by $\sqrt{62}$ cm $\sqrt{24}$ inches long with the seam centered lengthwise. Each sample shall be cut into two equal pieces with one piece retained by the fabricator and one piece given to the Contracting Officer for quality assurance testing and permanent record. Each sample shall be tagged to identify: (1) manufacturer's roll number; (2) date cut; (3) panel from which cut; (4) location in panel; (5) top sheet; (6) visual inspection comments; and (7) quality control inspector's name. The fabricator's seam samples shall be tested for shear strength and peel adhesion in accordance with ASTM D 4437. To be acceptable, four out of five replicate test specimens must meet specified seam strength requirements. Certified test results on factory seams shall be submitted and approved by the Inspector prior to delivery of any panels to the site.~~

PART 3 EXECUTION:

3.1 PREPARATION:

3.1.1 Surface Preparation.

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Surface preparation shall be performed in accordance with SECTION 02210: BACKFILL AND GRADING FOR REMEDIATION AREAS and shall include clearing, grubbing and proof rolling the exposed surface prior to installation of the bedding geotextile that shall underlie the geomembrane GRADING}. Material larger than $\sqrt{9.5}$ [] mm $\sqrt{3/8}$ 1/2 inch in diameter and any other debris which could damage the geomembrane shall be removed from the surfaces to be covered first by the bedding geotextile and then with the geomembrane. The subgrade surface shall be observed daily by the Inspector and Installer to evaluate the surface condition. Any damage to the subgrade caused by the Contractor's operations shall be repaired at no additional cost to the Government. Immediately prior to geomembrane placement, the Contracting Officer Inspector and Installer shall certify in writing that inspect the surface on which the bedding geotextile and then geomembrane is to be placed is acceptable.

NOTE: See Additional Note E.

3.1.2 Anchor/~~Drainage Trenches.~~

~~Only the amount of trench required for the geomembrane to be anchored in one day shall be excavated. Trench Corners shall be slightly rounded to avoid sharp bends in the geomembrane. The geomembrane shall be anchored as shown on the drawings. Loose soil, rock larger than $\sqrt{9.5}$ [] mm $\sqrt{3/8}$ 2 inches in diameter, and any other debris which could damage the geomembrane shall be removed from the surfaces of the trench. Backfilling and compaction shall be in accordance with SECTION 02210- GRADING } []~~

3.2 Panel/Sheet Deployment.

The geomembrane shall be placed with minimum handling. The procedures and equipment used shall not damage the geomembrane. Geomembrane damaged during installation shall be removed or repaired, at the Contracting Officer's Inspector's discretion and as specified in paragraph Defects and Repairs, at no additional cost to the government. Only those panels/sheets that can be anchored and seamed together the same day shall be deployed. Adequate ballast (e.g., sand bags) shall be placed on the geomembrane to prevent uplift by wind without damaging the geomembrane. No vehicular traffic will be allowed directly on the geomembrane. The method used to unroll the panels/sheets shall not scratch, crimp or excessively elongate the geomembrane and shall not detrimentally rut the subgrade soil as determined by the Inspector. Seams shall be oriented parallel to the line of maximum slope. Where seams can only be oriented across the slope, the upper panel shall be lapped over the lower panel.

3.2.1 Wrinkles.

The method used to place the panels/sheets shall minimize wrinkles; however, the geomembrane manufacturer and installer shall coordinate efforts to provide the proper amount of slack in the deployed geomembrane so as to compensate for contraction due to local temperature extremes.

3.2.2 Thickness Measurement: ~~Omitted.~~

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~~For non-textured material, a minimum of five thickness readings shall be taken along the edge across each panel/sheet width and at least two thickness measurements shall be taken along each panel/sheet length in accordance with ASTM D 751. A minimum of two additional readings shall be taken across the width at any point where the panel/sheet has been cut. For textured material, a minimum of one sample per \[9,300\] \[\] square meters \[\] \[100,000\] \[\] square feet \[\] shall be sent to the Independent Laboratory for thickness measurements in accordance with ASTM D 1593. Panels/sheets whose mil thickness falls below the specified minimum value shall be rejected and replaced at no additional cost to the Government.~~

3.3 FIELD SEAMING:

~~The Contractor shall to the extent possible limit the width of stockpile/staging/decontamination areas to minimize the need for on site seaming of geomembrane panels.~~

3.3.1 Test Seams.

Test seams shall be made on test strips of geomembrane to verify that seaming conditions are adequate. They shall be made in the area to be seamed and in contact with the subgrade. Test seams shall be made each day prior to production seaming, ~~whenever there is a change in seaming personnel or seaming equipment and at least once every four hours, by each seamer and each piece of seaming equipment used that day.~~ One sample shall be obtained from each test seam. ~~This sample shall be at least \^92 cm long by 51 cm wide \^ \^ 36 inches long by 20 inches wide \^ with the seam centered lengthwise. Ten Four random specimens \^2.54 cm \^ \^ 1 inch \^ \^ wide shall be cut from the sample.~~ The Installer shall field test ~~52~~ seam specimens for shear strength and ~~52~~ seam specimens for peel adhesion using an approved quantitative tensiometer. Jaw separation speed shall be ~~\^5.1 cm \^ \^ 20 inches \^ per minute.~~ ~~Where necessary, accelerated curing of test strip seams made by chemical fusion methods, shall be conducted in accordance with GRI GM7.~~ To be acceptable, ~~four 2~~ out of five ~~2~~ replicate test specimens must meet specified seam strength requirements of ~~10 lb/in.~~ If the field tests fail to meet these requirements of 10 lb/in. the entire operation shall be repeated. If the additional test seam fails, the seaming apparatus or seamer shall not be accepted or used for seaming until the deficiencies are corrected, ~~by the Installer and two consecutive successful test seams are achieved.~~

3.3.2 Field Seams:

3.3.2.1 General Requirements.

All panels/sheets shall be overlapped a minimum of ~~\^7.6 cm \^ \^ 3 inches \^~~. In corners and odd-shaped geometric locations, the number of field seams shall be minimized. Seaming shall extend to the outside edge of panels/sheets to be placed in anchor ~~and/or drainage trenches or berms.~~ Seaming shall not be conducted in the presence of standing water and/or soft subgrades as determined by the ~~Contracting Officer Inspector.~~ Wet surfaces shall be thoroughly dried and soft subgrades compacted and approved by the ~~Contracting Officer Installer and Inspector~~ prior to seaming. The seam area shall be cleaned of all dust, dirt, and foreign material prior to and during seaming.

3.3.2.2 Polyethylene Seams.

Polyethylene geomembranes shall be seamed by hot wedge methods. Extrusion welding shall only be allowed for patching and seaming around appurtenances. If seam overlap grinding is required, the

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procedure used shall not damage the geomembrane. Grinding marks shall be oriented perpendicular to the seam direction and no marks shall extend more than ~~3.2 mm~~ 1/8 inch beyond the extrudate after placement. The depth of the grinding marks shall be no greater than 10% of the sheet thickness. Where extrusion fillet welds are temporarily terminated long enough to cool, they shall be ground prior to applying new extrudate over the existing seam.

3.3.2.3 Non-Polyethylene Seams. ~~Omitted.~~

~~Non polyethylene geomembranes shall be seamed by hot wedge or chemical fusion methods as recommended by the geomembrane manufacturer. Seaming adhesives, solvents, or chemical cleaning agents shall be stored away from the panels/sheets and only spill resistant containers shall be used while working on the geomembrane. If low temperatures slow the curing process of chemically fused seams and delay seam testing, a small portable field oven with constant temperature control shall be used in accordance with GRI GM7 to accelerate sample curing.~~

3.3.3 Field Sampling and Testing: ~~Omitted.~~

3.3.3.1 Non-Destructive Field Seam Testing.

~~Field seams shall be non-destructively tested over their full length in accordance with the Installer's approved quality control manual. Seam testing shall be performed as the seaming work progresses, not at the completion of field seaming. Any seams which fail shall be documented and repaired in accordance with paragraph Defects and Repairs.~~

3.3.3.2 Destructive Field Seam Testing.

~~A minimum of one destructive test sample per 152 [] m 500 [] feet of field seam shall be obtained at locations specified by the Inspector. Sample locations shall not be identified prior to seaming. Samples shall be a minimum of 31 cm 12 inches wide by 122 cm 48 inches long with the seam centered lengthwise. Each sample shall be cut into three equal pieces with one piece retained by the Installer, one piece given to the Independent Laboratory, and the remaining piece given to the Contracting Officer for quality assurance testing and permanent record. Each sample shall be numbered and cross referenced to a field log which identifies: (1) panel/sheet number; (2) seam number; (3) top sheet; (4) date and time cut; (5) ambient temperature; (6) seaming unit designation; (7) name of seamer; and (8) seaming apparatus temperature and pressures (where applicable). A minimum of four 1 inch wide replicate specimens shall be cut from the Installer's sample. A minimum of 2 specimens shall be tested for shear strength and 2 for peel adhesion using an approved field quantitative tensiometer. Jaw separation speed shall be 5.1 cm 2 inches per minute. To be acceptable, all replicate test specimens must meet the specified seam strength requirements. If the field tests pass, 5 specimens shall be tested at the Independent Laboratory for shear strength and 5 for peel adhesion in accordance with ASTM D 4437. To be acceptable, 4 out of 5 replicate test specimens must meet specified seam strength requirements. If the field or laboratory tests fail, the seam shall be repaired in accordance with paragraph REPAIR PROCEDURES. In addition, destructive seam sample holes shall be repaired the same day as cut. Certified test results on field seams shall be submitted to and approved by the Contracting Officer prior to acceptance of the seam.~~

3.3.4 Defects and Repairs:**3.3.4.1 Identification.**

Immediately prior to covering the geomembrane, seams and non-seam areas shall be visually inspected by the ~~Inspector and~~ Contracting Officer for defects, holes, or damage due to weather conditions or construction activities. At the Contracting Officer's discretion, the surface of the geomembrane shall be brushed, blown, or washed by the ~~Contractor~~ Installer if the amount of dust, mud, or foreign material inhibits inspection or functioning of the overlying material.

3.3.4.2 Evaluation.

Each suspect location shall be ~~non-destructively tested. Each location that fails non-destructive testing shall be repaired, and re-tested by the Installer until it passes.~~

3.3.4.3 Repair Procedures.

Defective seam areas may be overlaid with a strip of new material and seamed (cap stripped). Alternatively, the seaming path shall be retraced to an intermediate location a minimum of ~~3.1 m~~ 10 feet on each side of the ~~defective failed seam location. At each location a 31 cm~~ 12 inch by ~~31 cm~~ 12 inch minimum size seam sample shall be taken for 2 additional shear strength and 2 additional peel adhesion tests using an approved quantitative field tensiometer. If these tests pass, then the remaining seam sample portion shall be sent to the Independent Laboratory for 2 shear strength and 2 peel adhesion tests in accordance with ASTM D 4437. If these laboratory tests pass, then the seam shall be cap stripped between that location and the original failed location. If field or laboratory tests fail, then the process is repeated. After cap stripping, the entire cap stripped seam shall be non-destructively tested. Certified test results on all repaired seams shall be submitted and approved by the Contracting Officer prior to covering the seamed areas.

3.3.4.4. Patches.

Tears, holes, blisters and areas with undispersed raw materials or foreign material contamination shall be repaired with patches. Patches shall have rounded corners, be made of the same geomembrane, and extend a minimum of ~~15.3 cm~~ 6 inches beyond the edge of defects. Minor localized flaws shall be repaired by spot welding or seaming as determined by the ~~Contracting Officer~~ Inspector. Repairs shall be non-destructively tested. The Inspector may also elect to perform a destructive seam test on a suspect area.

3.4 PENETRATIONS: (OMITTED)

~~Geomembrane penetration details shall be as shown on the Drawings [recommended by the geomembrane manufacturer, fabricator or installer, and as approved by the Contracting Officer]. Factory fabricated boots shall be used wherever possible. All tailored area field seams shall be non-destructively tested.~~

NOTE: Minimize the number of penetrations and show their locations on the drawings. The manufacturers, fabricators or installers typical penetration details should generally be used.

GUIDE SPECIFICATIONS ONLY

3.5 CAP SYSTEM COMPLETION: OMITTED.

~~The geomembrane shall be covered with the required materials within 5 [] days of acceptance. Folding over of geomembrane wrinkles will not be allowed prior to or during placement of cover materials.~~

~~NOTE: Reference all applicable cover system specification sections.~~

ADDITIONAL NOTES

~~Note A: For additional information on the use of all CEGS, see CEGS 01000 CEGS GENERAL NOTES.~~

~~NOTE B: This specification is written to allow any non-reinforced geomembrane material which meets the performance requirements specified. Typical materials include very low density polyethylene (VLDPE) and polyvinyl chloride (PVC), either textured or non-textured. High density polyethylene (HDPE) is not allowed because VLDPE conforms better to irregular surfaces and has better friction, elongation, puncture resistance, and stress crack resistance properties. Exceptions to this will be allowed where chemical resistance is critical.~~

~~NOTE C: This specification is based on the following assumptions: 1) The cover is designed with no tension in the geomembrane from cover loads; therefore, no additional requirements beyond NSF 54 standards for tensile, seam shear and peel strengths are required. If design calculations indicate that long term tension might be induced in the geomembrane, the design requirements for peel and shear strength of factory and field seams should be increased accordingly; 2) Subgrade conditions and placement methods are specified such that puncture and tear resistance requirements from NSF 54 standards are sufficient; 3) The geomembrane will be covered such that UV resistance, dimensional stability, and low temperature brittleness requirements from NSF 54 standards are sufficient; 4) The geomembrane is not in contact with the waste at any time; therefore, chemical resistance is not a problem. If the geomembrane will be in contact with the waste/leachate, alternate geomembrane materials (e.g. HDPE) should be evaluated and additional chemical resistance requirements should be included.~~

~~NOTE D: The rate of displacement and normal stresses used for friction testing are dependent on the materials being tested and anticipated site conditions. Friction testing may not be necessary where slope angles are less than interface friction angles or where reinforcement methods (e.g. geogrids) are used to stabilize the soil cover. Cap stability analyses should be run using an appropriate factor of safety. Typically, the factor of safety should be at least 1.5. If possible, laboratory friction tests should be conducted during design using site specific materials. Where this is not possible, an assumed interface friction angle should be selected for design calculations and specification requirements should be selected from current industry test values which used normal stresses similar to those anticipated in the field.~~

GUIDE SPECIFICATIONS ONLY

~~NOTE E: Determine the maximum allowable particle size based on typical puncture strengths of the thickness of the geomembrane selected. Other factors to consider include whether or not a geotextile or select fill is proposed beneath the geomembrane, cover placement methods, final loads on the geomembrane, economics of removing rocks, etc. Typical 1.0 mm (40 mil) geomembranes will survive puncture stresses from a 9.5 mm (3/8 inch) diameter rock and anticipated field cover loads.~~

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02272 (November 1996)

Superseding
CEGS-02272 (July 1995)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

SECTION 02272

SEPARATION/FILTRATION BEDDING GEOTEXTILE FOR
STAGING/DECONTAMINATION/STOCKPILE AREAS

11/96

NOTE: This guide specification covers the requirements for geotextile separation/filtration layers. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.

PART 1 GENERAL

NOTE: The Geotextile Engineering Manual by the Federal Highway Administration and "Designing with Geosynthetics" by Robert M. Koerner provide information on design criteria and calculations used for design of geotextiles.

1.1 REFERENCES

NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.

The publications listed below form a part of the specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3786 (1987) Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics-Diaphragm Bursting Strength Tester Method

ASTM D 4354 (1989; R 1994) Sampling of Geosynthetics for Testing

ASTM D 4355 (1992) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)

ASTM D 4491 (1992) Water Permeability of Geotextiles by Permittivity

ASTM D 4533 (1991) Trapezoid Tearing Strength of Geotextiles

- ASTM D 4632 (1991) Grab Breaking Load and Elongation of Geotextiles
- ASTM D 4751 (1993) Determining Apparent Opening Size of a Geotextile
- ASTM D 4759 (1988; R 1992) Determining the Specification Conformance of Geosynthetics
- ASTM D 4833 (1988) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
- ASTM D 4873 (1995) Identification, Storage, and Handling of Geotextiles

1.2 MEASUREMENT

~~NOTE: Delete paragraphs MEASUREMENT and PAYMENT when lump sum bidding is used.~~

Measurement will be made of the as-built surface area in square meters (yards) covered by geotextile. Allowance will be made for geotextile in anchor and/or drainage trenches but no allowance will be made for waste, overlaps, damaged materials, repairs, or materials used for the convenience of the Contractor.

1.3 PAYMENT

Geotextile installed and accepted will be paid for at the respective contract unit price in the bidding schedule. This unit price shall include the cost of materials, equipment, installation, testing, and other costs associated with placement of the geotextile.

1.4 ~~(QUALIFICATION) OMITTED~~

~~NOTE: Remove this paragraph if site verification sampling and testing will not be performed. The submittal requirement for the independent laboratory's qualifications should also be removed.~~

~~The Contractor shall hire a testing laboratory which is independent from the Contractor, manufacturer, or installer and is responsible for site verification testing. The laboratory shall have performed quality control and/or quality assurance testing on geotextiles for at least 3 projects of comparable size.~~

1.5 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~
~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation. Submittals having an "FIO"

designation are for information only. The following shall be submitted in accordance with SECTION 01300 SUBMITTAL PROCEDURES:

~~SD-01 Data~~

~~Thread; [FIO].~~

~~A minimum of [7] [] days prior to scheduled use, proposed thread type for sewn seams along with data sheets showing the physical properties of the thread.~~

~~SD-04 Drawings~~

~~Engineered Penetrations; [].~~

~~Geotextile penetration details.~~

1.5.1 SD-06 Instructions

Manufacturing, Sampling, and Testing; [FIO].

A minimum of [7] [] days prior to scheduled use, Manufacturer's quality control manual including instructions for storage, handling, installation, seaming, and repair.

~~SD-08 Statements~~

~~Qualifications; [].~~

~~Independent laboratory's qualification statement including resumes of key personnel involved in testing.~~

~~SD-09 Reports~~

~~Site Verification Sampling and Testing; [].~~

~~Certified site verification test results.~~

~~Seaming; [].~~

~~Certified seam strength test results.~~

1.5.2 SD-13 Certificates

Geotextile; [FIO].

A minimum of [7] [] days prior to scheduled use, Manufacturer's certificate of compliance stating that the geotextile meets the requirements of this section. This submittal shall include copies of manufacturer's quality control test results. For needle punched geotextiles, the manufacturer shall also certify that the geotextile has been continuously inspected using permanent on-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers. The certificate of compliance shall be attested to by a person having legal authority to bind the geotextile manufacturing company.

~~SD-14 Samples~~

~~Geotextile; [FIO].~~

~~A minimum of [7] [] days prior to scheduled use, one sample shall be provided for testing. The sample shall be a minimum 1.5 meters (5 feet) wide the full manufactured width of the geotextile and a minimum of 1.5 meters (5 feet) in length, folded over and the edges stitched with the same thread type, stitch density, and machine that will be used during construction. A smaller sample will be approved when no testing of the samples will be performed by the Government.~~

1.6 DELIVERY, STORAGE AND HANDLING

1.6.1 General

Geotextiles shall be labeled, handled, and stored in accordance with ASTM D 4873 and as specified herein. Each roll shall be wrapped in an opaque and waterproof layer of plastic during shipment and storage. The plastic wrapping shall not be removed until deployment. Each roll shall be labeled with the manufacturers name, geotextile type, lot number, roll number, and roll dimensions (length, width, gross weight). Geotextile or plastic wrapping damaged as a result of storage or handling shall be repaired or replaced, as directed. Geotextile shall not be exposed to temperatures in excess of 60 degrees C (140 degrees F) or less if recommended by the manufacturer.

1.6.2 Handling

No hooks, tongs or other sharp instruments shall be used for handling geotextile. Geotextile shall not be dragged along the ground.

PART 2 PRODUCTS

2.1 RAW MATERIALS

2.1.1 Geotextile

***** NOTE: ~~The Contractor should be required to perform interface friction testing in accordance with ASTM D 5321 if slope angles approach interface friction angles. The testing should model site specific conditions.~~

~~Compatibility testing should be considered in situations where the geotextile will be exposed to chemicals which could degrade its physical properties. The following information pertains to Table 1:~~

~~A. Site specific design calculations are required to determine appropriate AOS and permittivity values.~~

~~B. Puncture, grab tensile, and trapezoidal tear strengths are based on AASHTO specification M 288 minimum recommendations for a separation geotextile with a "high" degree of survivability and greater than 50 percent elongation at break. The most recent version of M 288 should be used as a reference. Installation stresses often exceed post construction stresses; therefore, designers should consider worst case placement conditions when specifying strength requirements. The wide width strip method (ASTM D 4595) may be more appropriate for specifying tensile strength than ASTM D 4632 if the geotextile will be placed in tension.~~

~~C. Elongation is another property which can be used to specify geotextiles. Geotextiles that have a high elongation at break can conform to irregular terrain and differential settlement with less damage than geotextiles with equivalent strength but lower elongation. Therefore, AASHTO specification M 288 requires separation geotextiles with an elongation of less than 50 percent at break have greater strength properties than geotextiles with an elongation at break greater than 50 percent.~~

~~D. Seam strength testing is often not required for separation/filtration geotextiles not placed in tension. Omit seam strength requirements from this table if seam testing will not be required. If the geotextile will be in tension, strength testing is required and ASTM D 4884 should be used to determine seam strength. Seam strength can be specified based on ASTM D 4632 for applications where the geotextile will not be placed in tension. In this case, seam strength requirements from AASHTO specification M 288 should be referenced.~~

EPA/600/R-93/182 "Quality Assurance and Quality Control of Waste Containment Facilities" indicates that "the gas collection layer above the waste and the geotextile protection layer between the drainage stone and a geomembrane are likely locations" for the use of geotextiles which contain post-consumer recycled materials.

The geotextile shall be a {woven} {or} {nonwoven} pervious sheet of polymeric material and shall consist of long-chain synthetic polymers composed of at least 85 percent by weight polyolefins, polyesters, or polyamides. Stabilizers and/or inhibitors shall be added to the base polymer if necessary to make the filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure. Regrind material which consists of edge trimming and other scraps that have never reached the consumer may be used to produce the geotextile. Post-consumer recycled material {may also} {shall not} be used. Geotextile shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including the selvages. The geotextile physical properties shall equal or exceed the minimum average roll values listed in Table 1. Acceptance of geotextile shall be in accordance with ASTM D 4759. Strength values shown are for the weaker principal direction.

TABLE 1. GEOTEXTILE PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TEST VALUE
Apparent Opening Size (U.S. Sieve)	ASTM D 4751	[]
Permittivity, sec 1	ASTM D 4491	[]
Puncture, N	ASTM D 4833	[330] []
Grab Tensile, N	ASTM D 4632	[800] []
Trapezoidal Tear, N	ASTM D 4533	[330] []
Burst Strength, psi	ASTM D 3786	[]
Ultraviolet Degradation (percent strength retained at 500 hours)	ASTM D 4355	[70] []
Seam Strength, N	ASTM D 4632	[]

TABLE 1. GEOTEXTILE PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TEST VALUE
Unit Weight oz/yd	ASTM D 3776	Separation Geotextile []
Apparent Opening Size (U.S. Sieve)	ASTM D 4751	Bedding Geotextile []
Permittivity, sec 1	ASTM D 4491	[]
Puncture, lbs.	ASTM D 4833	[75] []
Grab Tensile, lbs.	ASTM D 4632	[180] []
Trapezoidal Tear, lbs.	ASTM D 4533	[75] []
Burst Strength, psi	ASTM D 3786	[]
Ultraviolet Degradation (percent strength retained at 500 hours)	ASTM D 4355	[70] []
Seam Strength, lbs.	ASTM D 4632	[]

Table 1 Geotextile Physical Properties

PROPERTY	TEST METHOD	TEST VALUE	
		Separation Geotextile	Bedding Geotextile
Unit Weight oz/yd ²	ASTM D 3776	10	16
Puncture, lbs.	ASTM D 4833	75	200
Grab Tensile, lbs.	ASTM D 4632	180	350
Trapezoidal Tear, lbs.	ASTM D 4533	75	130
Ultraviolet Degradation (percent strength retained at 500 hours)	ASTM D 4355	70	70

2.1.2 Thread OMITTED

~~Sewn seams shall be constructed with high strength polyester, nylon, or other approved thread type. Thread shall have equivalent ultraviolet light stability as the geotextile and the color shall contrast with the geotextile.~~

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS

2.2.1 Manufacturing, Sampling, and Testing

~~Geotextiles and factory seams shall meet the requirements specified in Table 1. Manufacturing quality control testing shall be performed in accordance with the manufacturer's approved quality control manual. As a minimum, geotextiles shall be randomly sampled for testing in accordance with ASTM D 4354 (Procedure A).~~

2.2.2 Site Verification Sampling and Testing

~~NOTE: The need for and amount of site verification testing should be based on site conditions and the amount of geotextile being placed. EPA/600/R-93/182 indicates that a frequency of testing of once per 10,000 square meters (100,000 square feet) has been used in the past for some hazardous waste containment facilities.~~

~~Samples shall be collected upon delivery to the site [at the request of the Contracting Officer] [in accordance with ASTM D 4354 (Procedure B)] [at a frequency of one per 10,000 square meters (100,000 square feet).]~~

~~Samples shall be tested to verify the geotextile meets the requirements specified in Table 1. ASTM D 4355 does not need to be performed on the collected samples. Samples shall be identified by manufacturer's name, type of geotextile, lot number, roll number, and machine direction. Testing shall be performed at an approved laboratory. Test results from the lot under review shall be submitted and approved prior to deployment of that lot of geotextile. Rolls which are sampled shall be immediately rewrapped in their protective covering.~~

PART 3 EXECUTION

3.1 SURFACE PREPARATION

~~NOTE: Reference the appropriate sections for compaction requirements if the geotextile will be placed on a soil subgrade.~~

The surface underlying the geotextile shall be smooth and free of ruts or protrusions which could damage the geotextile. Subgrade materials ~~and compaction requirements~~ shall be in accordance with Section ~~[]~~ **02110 CLEARING AND GRUBBING**.

3.2 INSTALLATION

~~The Contracting Officer shall be present during handling and installation.~~

Geotextile rolls which are damaged or contain imperfections shall be repaired or replaced as directed. The geotextile shall be laid smooth so as to be free of tensile stresses, folds, and wrinkles. On slopes greater than 5 horizontal on 1 vertical, the geotextile shall be laid with the machine direction of the fabric parallel to the slope direction.

3.3 PROTECTION

~~NOTE: The use of staples or pins to hold geotextiles in place should not be allowed in applications where the geotextile will be located adjacent to other geosynthetic layers which could be damaged.~~

The geotextile shall be protected during installation from clogging, tears, and other damage. Damaged geotextile shall be repaired or replaced as directed. Adequate ballast (e.g. sand bags) shall be used to prevent uplift by wind. Staples or pins shall not be used to hold the geotextile in place. The geotextile shall not be left uncovered for more than [14] ~~[]~~ days during installation. The initial loose soil lift height over the geotextile shall be between 200 mm (8 inches) and 300 mm (12 inches). Equipment with ground pressures less than 35 kPa (5.0 psi) shall be used to place the first lift over the geotextile. Overlying materials shall be deployed such that the geotextile is not shifted, damaged, or placed in tension. Cover soil shall be placed from the bottom of the slope upward. Cover soil placed from a bucket shall be dropped from a height no greater than [900] ~~[]~~ mm. ~~([3] [] feet.)~~

3.4 SEAMING

~~NOTE: A sewn flat seam using a two thread chain stitch is often specified for geotextiles which are not placed in tension. Overlapped seams are also commonly used for geotextiles not placed in tension.~~

~~For geotextiles placed in tension, stronger and more complex seams are used. The appropriate seam type should be based on manufacturer's recommendations. A minimum seam strength per ASTM D 4884 should also be specified. The contract documents should indicate which seams must be sewn.~~

~~For overlapped seams, the 300 mm (12 inch) overlap specified in this paragraph should be the minimum in all cases. Table 3 of AASHTO specification M 288 provides additional guidance on overlap requirements.~~

3.4.1 Overlap Seams

Geotextile panels shall be continuously overlapped a minimum of [300] [] mm. ([12] [] inches.) Where it is required that seams be oriented across the slope of a berm or barrier, the upper sheet shall be lapped over the lower sheet. The Contractor has the option of field sewing instead of overlapping.

3.4.2 Sewn Seams

Seams shall be sewn at the locations shown on the drawings. [Seams shall be continuously sewn using a flat seam with one row of a two-thread chain stitch unless otherwise recommended by the manufacturer. The minimum distance from the geotextile edge to the stitch line nearest to that edge shall be 75 mm (3 inches) unless otherwise recommended by the manufacturer.] [Seams shall be tested at a frequency of once per 1000 m. (1100 yards.) Seam strength shall meet the minimum requirements specified in Table 1.] The thread at the end of each seam run shall be tied off to prevent unraveling. Seams shall be on the top side of the geotextile to allow inspection. Skipped stitches or discontinuities shall be sewn with an extra line of stitching with 450 mm (18 inches) of overlap.

3.5 REPAIRS

Geotextile damaged during installation shall be repaired by placing a patch of the same type of geotextile which extends a minimum of 300 mm (12 inches) beyond the edge of the damage or defect. Patches shall be continuously fastened using a sewn seam or other approved method. The machine direction of the patch shall be aligned with the machine direction of the geotextile being repaired. Geotextile which cannot be repaired shall be replaced.

3.6 ENGINEERED PENETRATIONS OMITTED

~~Engineered penetrations of the geotextile shall be constructed [as shown on the drawings] [or] [by approved methods recommended by the geotextile manufacturer].~~

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02546 (April 1989)

GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~

~~Includes changes through Notice 6 (April 1996)~~

~~Latest Notice change indicated by \&\ tokens~~

SECTION 02546
AGGREGATE SURFACE COURSE
04/89

NOTE: ~~This guide specification covers the requirements for aggregate surfacing for roads, streets, and parking areas. This guide specification is to be used in the preparation of project specifications in accordance with ER 1410-345-720.~~

PART 1 GENERAL

1.1 REFERENCES

NOTE: ~~Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 117	\&(1995)&\ Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	(1989)Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	\&(1995a)&\ Sieve Analysis of Fine and Coarse Aggregates
ASTM D 75	(1987; R 1992) Sampling Aggregates
ASTM D 422	(1963; R 1990) Particle-Size Analysis of Soils
ASTM D 1556	(1990) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1991)Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))

ASTM D 2167	\\&(1994)&\\ Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2922	(1991) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1988; R 1993) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 3740	\\&(1994a)&\\ Minimum Requirements for &\\ Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM D 4318	\\&(1993)&\\ Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM E 11	\\&(1995)&\\ Wire-Cloth Sieves for Testing Purposes

1.2 UNIT PRICES

~~NOTE: Delete this paragraph for lump-sum construction projects.~~

1.2.1 Measurement

The quantity of aggregate surface course completed and accepted as determined by the Contracting Officer will be measured in [square] [cubic] meters. (yards.) [The volume of aggregate surface course in place and accepted by the Contracting Officer will be determined by the average job thickness obtained in accordance with paragraph THICKNESS CONTROL and the dimensions shown on approval plans and drawings.]

1.2.2 Payment

Quantities of aggregate surface course for roads and airfields, as specified in paragraph Measurement, will be paid for at the respective contract unit prices. Payment will constitute full compensation for the construction and completion of the aggregate surface course, including furnishing all labor and incidentals necessary to complete the work required by this section.

1.3 DEGREE OF COMPACTION

Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated herein as present laboratory maximum density.

1.4 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

1.4.1 SD-01 Data

Equipment; ☐ FIO.

List of proposed equipment to be used in performance of construction work including descriptive data.

1.4.2 SD-09 Reports

Sampling and Testing; ☐ GA. Density Test; ☐ GA.

Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within [24] ☐ hours after the tests are performed. Test results from samples, not less than [30] ☐ days before material is required for the work. Results of laboratory tests for quality control purposes, for approval, prior to using the material.

1.5 EQUIPMENT

~~NOTE: If desirable, requirements for types of equipment applicable to methods of construction based on local conditions will be included.~~

All plant, equipment, and tools used in the performance of the work covered by this section will be subject to approval by the Contracting Officer before the work is started and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, and meeting the grade controls, thickness controls, and smoothness requirements set forth herein.

1.6 SAMPLING AND TESTING

~~NOTE: Field density tests and laboratory tests are generally performed at a frequency of one set of tests for every 1,000 square meters (yards) of completed area. Other frequency intervals may be specified when conditions warrant. It is important that both field density tests and laboratory tests be conducted on the same materials.~~

Sampling and testing shall be the responsibility of the Contractor. Sampling and testing shall be performed by an approved commercial testing laboratory or by the Contractor, subject to approval. If the Contractor elects to establish testing facilities of his own, approval of such facilities shall be based on compliance with ASTM D 3740, and no work requiring testing will be permitted until the Contractor's facilities have been inspected and approved.

1.6.1 Sampling

Sampling for material gradation, liquid limit, and plastic limit tests shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the Contracting Officer.

1.6.2 Testing

1.6.2.1 Gradation

Aggregate gradation shall be made in conformance with ASTM C 117, ASTM C 136, and ASTM D 422. Sieves shall conform to ASTM E 11.

1.6.2.2 Liquid Limit and Plasticity Index

Liquid limit and plasticity index shall be determined in accordance with ASTM D 4318.

1.6.3 Approval of Materials

The source of the material to be used for producing aggregates shall be selected ~~[]~~ 30 days prior to the time the material will be required in the work. Approval of sources not already approved by the Corps of Engineers will be based on an inspection by the Contracting Officer. Tentative approval of materials will be based on appropriate test results on the aggregate source. Final approval of the materials will be based on tests for gradation, liquid limit, and plasticity index performed on samples taken from the completed and compacted surface course.

1.7 WEATHER LIMITATIONS

~~NOTE: The first sentence of this paragraph may be deleted in localities where freezing temperatures do not occur.~~

Aggregate surface courses shall not be constructed when the ambient temperatures is below 2 degrees C (35 degrees F) and on subgrades that are frozen or contain frost. It shall be the responsibility of the Contractor to protect, by approved method or methods, all areas of surfacing that have not been accepted by the Contracting Officer. Surfaces damaged by freeze, rainfall, or other weather conditions shall be brought to a satisfactory condition by the Contractor.

PART 2 PRODUCTS

2.1 AGGREGATES

~~NOTE: As written, this paragraph applies to general conditions. Other materials such as disintegrated granite, volcanic ash or cinders, limerock, and caliche will be specified when supported by adequate performance data. The requirement for soundness and percentage of wear will be deleted when local experience indicates the material is satisfactory.~~

~~The gradation or gradations applicable to the specific job will be specified. The gradations shown are recommended, but others may be used where they have been used successfully. The liquid limit and plasticity index specified are normally used, but may be changed as required. Gradations No. 3 and No. 4 may be susceptible to frost damage.~~

~~When an aggregate surfacing is used in construction of Army Class IV airfields, paragraph PROOF ROLLING will be retained, and the extent of proof rolling will be precisely shown on the drawings. When using the specifications for an aggregate surface course subjected to highway vehicular traffic such as roads, streets, and parking areas or for Army Class I, II, and III airfields, references to proof rolling will be deleted in paragraph AGGREGATES, and paragraph PROOF ROLLING will be deleted.~~

Aggregates shall consist of clean, sound, durable particles of natural gravel, crushed gravel, crushed stone, sand, slag, soil, or other approved materials processed and blended or naturally combined. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings, and other foreign materials. The Contractor shall be responsible for obtaining materials that meet the specification and can be used to meet the grade and smoothness requirements specified herein after all compaction and proof rolling operations have been completed.

2.1.1 Coarse Aggregates

~~NOTE: A percentage of wear other than 50 may be specified where experience indicates that the material is satisfactory.~~

The material retained on the 4.75 mm (No. 4) sieve shall be known as coarse aggregate. Coarse aggregates shall be reasonably uniform in density and quality. The coarse aggregate shall have a percentage of wear not to exceed 50 percent after 500 revolutions as determined by ASTM C 131.

The amount of flat and/or elongated particles shall not exceed 20 percent. A flat particle is one having a ratio of width to thickness greater than three; an elongated particle is one having a ratio of length to width greater than three. When the coarse aggregate is supplied from more than one source, aggregate from each source shall meet the requirements set forth herein.

2.1.2 Fine Aggregates

The material passing the 4.75 mm (No. 4) sieve shall be known as fine aggregate. Fine aggregate shall consist of screenings, sand, soil, or other finely divided mineral matter that is processed or naturally combined with the coarse aggregate.

2.1.3 Gradation Requirements

Gradation requirements specified in TABLE I shall apply to the completed aggregate surface. It shall be the responsibility of the Contractor to obtain materials that will meet the gradation requirements after mixing, placing, compacting, and other operations. TABLE I shows permissible gradings for granular material used in aggregate surface roads and airfields. Sieves shall conform to ASTM E 11.

TABLE I. GRADATION FOR AGGREGATE SURFACE COURSES

Sieve Designation	No. 1	No. 2	No. 3	No. 4
25.0 mm	100		100	100
9.5 mm		50-85	60-100	
4.7 mm		35-65	50-85	55-100
2.00 mm		25-50	40-70	40-100
0.425 mm		15-30	24-45	20-50
0.075 mm		8-15	8-15	8-15

TABLE I. GRADATION FOR AGGREGATE SURFACE COURSES

Sieve Designation	No. 1	No. 2	No. 3	No. 4
1 in.		100	100	100
3/8 in.		50-85	60-100	--

No. 4	35-65	50-85	55-100	70-100
No. 10	25-50	40-70	40-100	55-100
No. 40	15-30	24-45	20-50	30-70
No. 200	8-15	8-15	8-15	

2.1.4 Liquid Limit and Plasticity Index

The portion of the completed aggregate surface course passing the 0.425 mm (No. 40) sieve shall have a maximum liquid limit of 35 and a plasticity index of 4 to 9.

PART 3 EXECUTION

3.1 OPERATION OF AGGREGATE SOURCES

Clearing, stripping, and excavating shall be the responsibility of the Contractor. The aggregate sources shall be operated to produce the quantity and quality of materials meeting these specification requirements in the specified time limit. Upon completion of the work, the aggregate sources on Government reservations shall be conditioned to drain readily and be left in a satisfactory condition. Aggregate sources on private lands shall be conditioned in agreement with local laws or authorities.

3.2 STOCKPILING MATERIALS

NOTE: In cases where material previously stockpiled under a separate contract is utilized in the construction of the aggregate surface course, this equipment will be included in the \&SPECIAL CONTRACT REQUIREMENTS& \ of the specifications, and this paragraph will be modified as required.

Prior to stockpiling the material, the storage sites shall be cleared and leveled by the Contractor. All materials, including approved material available from excavation and grading, shall be stockpiled in the manner and at the locations designated. Aggregates shall be stockpiled in such a manner that will prevent segregation. Aggregates and binders obtained from different sources shall be stockpiled separately. Materials shall be stockpiled in accordance with Section 02229: EXCAVATION AND COMPLETE REMOVAL OF TNT PIPELINES.

3.3 PREPARATION OF UNDERLYING COURSE SUBGRADE

NOTE: The reference to the specification section that covers the preparation of the subgrade surface for the particular project will be included in this paragraph.

The underlying course {subgrade}, including shoulders, shall be cleaned of all foreign substances. At the time of surface course construction, the underlying course {subgrade} shall contain no frozen material. Ruts or soft yielding spots in the underlying course {subgrade} areas having inadequate compaction and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade and recompacting to density requirements specified in Section 02241: AGGREGATE BASE COURSE 02234: SUBBASE COURSE. The completed underlying course {subgrade} shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the surface course is placed.

3.4 GRADE CONTROL

During construction, the lines and grades including crown and cross slope indicated for the aggregate surface course shall be maintained by means of line and grade stakes placed by the Contractor in accordance with the ~~&SPECIAL CONTRACT REQUIREMENTS&~~.

3.5 MIXING AND PLACING MATERIALS

NOTE: ~~More details of applicable method(s) of placing, mixing, and spreading will be included when appropriate.~~

The materials shall be mixed and placed in such a manner as to obtain uniformity of the material and at a uniform optimum water content for compaction. The Contractor shall make such adjustments in mixing or placing procedures or in equipment so as to obtain the true grades, to minimize segregation and degradation, to obtain the desired water content, and to ensure a satisfactory surface course.

3.6 LAYER THICKNESS

The aggregate material shall be placed on the {underlying course} ~~{subgrade}~~ in layers of uniform thickness. When a compacted layer of ~~150 mm~~ (6 inches) or less is specified, the material may be placed in a single layer; when a compacted thickness of more than ~~150 mm~~ (6 inches) is required, no layer shall exceed ~~150 mm~~ (6 inches) nor be less than ~~75 mm~~ (3 inches) when compacted.

3.7 COMPACTION

Each layer of the aggregate surface course shall be compacted with approved compaction equipment. The water content during the compaction procedure shall be maintained at optimum or at the percentage specified by the Contracting Officer ~~necessary to achieve the required degree of compaction~~. In locations not accessible to the rollers, the mixture shall be compacted with mechanical tampers. Compaction shall continue until each layer through the full depth is compacted to at least ~~100%~~ percent of laboratory maximum density. Any materials that are found to be unsatisfactory shall be removed and replaced with satisfactory material or reworked to produce a satisfactory material.

3.8 (PROOF ROLLING) OMITTED

NOTE: ~~When an aggregate surfacing is used in construction of Army Class IV airfields, this paragraph will be retained, and the extent of proof rolling will be precisely shown on the drawings. When using the specifications for an aggregate surface course subjected to highway vehicular traffic such as roads, streets, and parking areas or for Army Class I, II, and III airfields, references to proof rolling will be deleted in paragraph AGGREGATES, and this paragraph will be deleted.~~

~~Proof rolling of the areas designated shall be in addition to compaction specified above and shall consist of application of 30 coverages with a heavy rubber tired roller having four tires abreast with each tire loaded to 13,600 kg (30,000 pounds) and tires inflated to 1000 kPa (150 psi). (150 psi.) In the areas designated, proof rolling shall be applied to the top lift of layer on which surface course is laid and to each layer of the base course. Water content of the lift of the layer on which the surface course is placed and each layer of the aggregate surface course shall be maintained at optimum or at the percentage directed from the start of compaction to the completion of a proof rolling. Materials in the aggregate surface course or underlying~~

materials indicated unacceptable by the proof rolling shall be removed and replaced, as directed, with acceptable materials.

3.9 EDGES OF AGGREGATE-SURFACED ROAD

Approved material shall be placed along the edges of the aggregate surface course in such quantity as to compact to the thickness of the course being constructed. When the course is being constructed in two or more layers, at least ~~300 mm~~ (1 foot) of shoulder width shall be rolled and compacted simultaneously with the rolling and compacting of each layer of the surface course.

3.10 SMOOTHNESS TEST

The surface of each layer shall not show any deviations in excess of ~~9.5 mm (3/8 inch)~~ (3/8 inch) when tested with a ~~3.05 m (10 foot)~~ (10 foot) straightedge applied both parallel with and at right angles to the centerline of the area to be paved. Deviations exceeding this amount shall be corrected by the Contractor by removing material, replacing with new material, or reworking existing material and compacting, as directed.

3.11 THICKNESS CONTROL

NOTE: When gravel surface courses are constructed less than 150 mm (6 inches) in total thickness, a deficiency of $\pm 13 \text{ mm}$ (1/2 inch) in the thickness of any area of such paving is considered excessive. Applicable to job conditions, the thickness tolerances provisions will therefore be modified as required, restricting all deficiencies to not more than $\pm 6 \text{ mm}$ (1/4 inch).

The completed thickness of the aggregate surface course shall be within $\pm 13 \text{ mm}$ (1/2 inch), $\pm 1/2$ inch, plus or minus, of the thickness indicated on plans. The thickness of the aggregate surface course shall be measured at intervals in such manner that there will be a thickness measurement for at least each 500 square meters (yards) of the aggregate surface course. The thickness measurement shall be made by test holes at least ~~$\pm 75 \text{ mm}$ (3 inches)~~ (3 inches) in diameter through the aggregate surface course. When the measured thickness of the aggregate surface course is more than ~~$\pm 13 \text{ mm}$ (1/2 inch)~~ (1/2 inch) deficient in thickness, the Contractor, at no additional expense to the Government, shall correct such areas by scarifying, adding mixture of proper gradation, reblading, and recompacting, as directed. Where the measured thickness of the aggregate surface course is more than ~~$\pm 13 \text{ mm}$ (1/2 inch)~~ (1/2 inch) thicker than that indicated, it shall be considered as conforming with the specified thickness requirements plus ~~$\pm 13 \text{ mm}$ (1/2 inch)~~ (1/2 inch). The average job thickness shall be the average of the job measurements determined as specified above, but shall be within ~~$\pm 6 \text{ mm}$ (1/4 inch)~~ (1/4 inch) of the thickness indicated. When the average job thickness fails to meet this criterion, the Contractor shall, at no additional expense to the Government, make corrections by scarifying, adding or removing mixture of proper gradation, and reblading and recompacting, as directed.

3.12 DENSITY TESTS

Density shall be measured in the field in accordance with ~~[ASTM D 1556]~~ [ASTM D 2167] [ASTM D 2922]. ~~[For the method presented in ASTM D 1556 the base plate as shown in the drawing shall be used.]~~ [For the method presented in ASTM D 2922 the calibration curves shall be checked and adjusted, if necessary, using only the sand cone method as described in paragraph Calibration of the ASTM publication.] Tests performed in accordance with ASTM D 2922 result in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall also be checked along with density calibration checks as described in ASTM D 3017. [The calibration checks of both the density and moisture gauges shall be made by the prepared containers

of material method, as described in paragraph Calibration of ASTM D 2922, on each different type of material being tested at the beginning of a job and at intervals, as directed.†

3.13 WEAR TEST

Wear tests shall be made in conformance with ASTM C 131.

3.14 MAINTENANCE

The aggregate surface course shall be maintained in a condition that will meet all specification requirements until accepted.

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

~~Lake Ontario~~

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS

CEGS-02551 (April 1989)

Superseding
CEGS-02551 (September 1984)

~~GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION~~

~~Includes note relocation Special change (August 1995) Includes Text Adjustment Change
(Section 01300 Reference)(March 1995)-
Includes changes through Notice 6 (September 1995)
Latest Notice change indicated by \&\&\ tokens~~

SECTION 02551
BITUMINOUS PAVING FOR ROADS, STREETS AND OPEN STORAGE AREAS
04/89

~~NOTE: This guide specification covers the requirements for bituminous intermediate and wearing courses
(central plant hot mix). This guide specification is to be used in the preparation of project specifications in
accordance with ER 1110-345-720.~~

PART 1 GENERAL

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by
the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 29 (1991a) Unit Weight and Voids in Aggregate

ASTM C 88 (1990) Soundness of Aggregates by Use
of Sodium Sulfate or Magnesium Sulfate

ASTM C 117 (1990) Materials Finer than
75 micrometer (No 200) Sieve in Mineral Aggregates
by Washing

ASTM C 127 (1988) Specific Gravity and Absorption of
Coarse Aggregate

ASTM C 128	(1988) Specific Gravity and Absorption of Fine Aggregate
ASTM C 131	(1989) Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(1984a) Sieve Analysis of Fine and Coarse Aggregates
ASTM C 183	(1988) Sampling and the Amount of Testing of Hydraulic Cement
ASTM D 5 Materials	(1986) Penetration of Bituminous Materials
ASTM D 75	(1987) Sampling Aggregates
ASTM D 140	(1988) Sampling Bituminous Materials
ASTM D 242	(1985; R 1990) Mineral Filler for Bituminous Paving Mixtures
ASTM D 422	(1963; R 1990) Particle Size Analysis of Soils
ASTM D 946	(1982) Penetration Graded Asphalt Cement for Use in Pavement Construction
ASTM D 1250	(1980; R 1990) Petroleum Measurement Tables
ASTM D 1856	(1979; R 1984) Recovery of Asphalt from Solution by Abson Method
ASTM D 2041	(1991) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D 2172	(1992) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 2216	(1990) Laboratory Determination of Water (Moisture) Content of Soil, and Rock
ASTM D 3381	(1983) Viscosity Graded Asphalt Cement for Use in Pavement Construction
ASTM D 3515	(1989) Hot-Mixed, Hot-Laid Bituminous Paving Mixtures
ASTM D 4791	(1989) Flat or Elongated Particles in Coarse Aggregate
January 1990	New York State Department of Transportation Standard Specifications, Construction, and Materials

~~/&&/~~

1.2 UNIT PRICES

1.2.1 Measurement

~~NOTE: Paragraphs Measurement and Payment will be deleted if the work is included in one lump sum contract price. Lump sum contracts should not be used when job exceeds 1000 tons.~~

1.2.1.1 Intermediate- and Wearing-Course Tonnage

The amount paid for will be the number of metric tons (2,000-pound tons) of bituminous mixture used in the accepted work. Bituminous mixture shall be weighed after mixing. No deduction will be made for weight of bituminous materials incorporated herein.

1.2.1.2 Correction Factor for Aggregates Used

Quantities of paving mixtures called for are based on aggregates having a specific gravity of 2.70 as determined in accordance with the Apparent Specific Gravity paragraphs in ASTM C 127 and ASTM C 128.

Correction in tonnage of intermediate- and wearing-course mixtures shall be made to compensate for the difference in the tonnage of mixtures used in the project, when specific gravities of aggregates used in mixtures are more than 2.75 and less than 2.65. Tonnage paid for will be the number of tons used, proportionately corrected for specific gravities, using 2.70 as the base correctional factor.

1.2.1.3 Bituminous Material

Bituminous material to be paid for shall be the number of [gallons of material used in the accepted work, corrected to gallons at 15.6 degrees C (60 degrees F) (60 degrees F) in accordance with ASTM D 1250] [metric tons (2000-pound tons) of materials used in the accepted work].

1.2.2 Payment

Quantities of intermediate- and wearing-course mixtures, determined as specified above, will be paid for at respective contract unit prices or at reduced prices adjusted in accordance with paragraph ACCEPTABILITY OF WORK. Payment shall constitute full compensation for preparing or reconditioning the base course or existing pavement; for furnishing all materials, equipment, plant, and tools; and for labor and other incidentals necessary to complete work required.

1.3 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

SD-09 Reports

Bituminous Pavement; ~~GA~~ [] .

Copies of test results.

SD-14 Samples

Bituminous Pavement; [] .

~~Samples of the materials in the quantities indicated below for the job mix formula.~~

~~Aggregate and mineral filler (if needed) 100 kg
to be blended in approximately the same
proportions as used in the project~~

~~Asphalt Cement 20 liters~~

~~{
Aggregate and mineral filler (if needed) 200 pounds
to be blended in approximately the same
proportions as used in the project~~

~~Asphalt Cement 5 gallons~~

~~}
Aggregate samples when new sources are developed, with a plan for operation, [] days before starting
production. Samples of the asphalt cement specified, not less than [] days before production.~~

SD-18 Records

Waybills and Delivery Tickets; ~~FOI~~ [] .

Waybills and delivery tickets, during progress of the work.

1.4 PLANT, EQUIPMENT, MACHINES, AND TOOLS

1.4.1 General

The bituminous plant shall be of such capacity to produce the quantities of bituminous mixtures required. Hauling equipment, paving machines, rollers, miscellaneous equipment, and tools shall be provided in sufficient numbers and capacity and in proper working condition to place the bituminous paving mixtures at a rate equal to the plant output.

1.4.2 Mixing Plants

~~NOTE: The minimum plant capacity depends on the size of job and time requirements; however, in no case should the plant capacity be less than 100 metric tons (tons) per hour. When the job is less than 1,000 metric tons (tons), the Contractor may be required to do all testing including mix design.~~

The mixing plant shall be an automatic or semiautomatic controlled commercially manufactured unit designed and operated to consistently produce a mixture ~~meeting the material specifications within the job mix formula (JMF).~~ The plant shall have a minimum capacity of 1,000 [] metric tons (tons) per hour. ~~Drum mixers shall be prequalified at the production rate to be used during actual mix production. The prequalification tests will include extraction and recovery of the asphalt cement in accordance with ASTM D-2172 and ASTM D-1856. The~~

~~penetration of the recovered asphalt binder shall not be less than 60 percent of the original penetration, as measured in accordance with ASTM D-5.~~

1.4.3 Straightedge

The Contractor shall furnish and maintain at the site, in good condition, one ~~3.66 m (12 foot)~~ (12-foot) straightedge for each bituminous paver. Straightedge shall be made available for Government use. Straightedges shall be constructed of aluminum or other lightweight metal and shall have blades of box or box-girder cross section with flat bottom reinforced to insure rigidity and accuracy. Straightedges shall have handles to facilitate movement on pavement.

1.5 WEATHER LIMITATIONS

Unless otherwise directed, bituminous courses shall not be constructed when temperature of the surface of the existing pavement or base course is below 5 degrees C. (40 degrees F.)

1.6 PROTECTION OF PAVEMENT

After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until the pavement has cooled to 60 degrees C. (140 degrees F.)

1.7 GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS

Finished surface of bituminous courses, when tested as specified below and in paragraph ACCEPTABILITY OF WORK, shall conform to gradeline and elevations shown and to surface-smoothness requirements specified.

1.7.1 Plan Grade

The grade of the completed surface shall not deviate more than ~~15.2 mm (0.05 foot)~~ (0.05 foot) from the plan grade.

1.7.2 Surface Smoothness

When a ~~3.66 m (12 foot)~~ (12-foot) straightedge is laid on the surface parallel with the centerline of the paved area or transverse from crown to pavement edge, the surface shall vary not more than ~~6.4 mm (1/4 inch)~~ (1/4 inch) from the straightedge.

1.8 GRADE CONTROL

Lines and grades shall be established and maintained by means of line and grade stakes placed at site of work; ~~in accordance with the SPECIAL CLAUSES~~. Elevations of bench marks used by the Contractor for controlling pavement operations at the site of work will be determined, established, and maintained by the Government. Finished pavement elevations shall be established and controlled at the site of work by the Contractor in accordance with bench mark elevations furnished by the Contracting Officer.

1.9 ~~OMITTED~~ SAMPLING AND TESTING

1.9.1 ~~Aggregates~~

1.9.1.1 ~~General~~

~~Samples of aggregates shall be furnished by the Contractor for approval of aggregate sources and stockpiles prior to the start of production and at times during production of the bituminous mixtures. Times and points of sampling will be designated by the Contracting Officer. Samples will be the basis of approval of specific sources or stockpiles of aggregates for aggregate requirements. Unless otherwise directed, ASTM D-75 shall be used in~~

sampling coarse and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. All tests necessary to determine compliance with requirements specified herein will be made by the Government.

1.9.1.2 Sources

~~NOTE: Satisfactory service record for an aggregate will be determined based on the aggregate's ability to resist polishing, raveling, stripping, and degradation under traffic and climatic conditions similar to that expected during its use. If performance data indicate that an aggregate is susceptible to one or more of the above mentioned problems, that source of aggregate shall be rejected.~~

~~Sources of aggregates shall be selected well in advance of the time the materials are required in the work. If a previously developed source is selected, evidence shall be submitted [] days before starting production, indicating that the central plant hot mix bituminous pavements constructed with the aggregates have had a satisfactory service record of at least five years under similar climatic and traffic conditions. The Contracting Officer will make such tests and other investigations as necessary to determine whether aggregates meeting requirements specified herein can be produced from proposed sources. If a sample of material from a new source fails to meet specification requirements, the material represented by the sample shall be replaced, and the cost of testing the replaced sample will be at the expense of the Contractor. Approval of the source of aggregate does not relieve the Contractor of responsibility for delivery at the jobsite of aggregates that meet the requirements specified herein.~~

1.9.2 Bituminous Materials

~~Samples of bituminous materials shall be obtained by the Contractor; sampling shall be in accordance with ASTM D-140. Tests necessary to determine conformance with requirements specified herein will be performed by the Government without cost to the Contractor. Sources where bituminous materials are obtained shall be selected in advance of the time when materials will be required in the work. In addition to initial qualification testing of bituminous materials, samples shall be taken before and during construction when shipments of bituminous materials are received or when necessary to assure some condition of handling or storage has not been detrimental to the bituminous material. The samples will be taken by the Contractor and tested by the Contracting Officer.~~

1.9.3 Bituminous Mixtures

~~Sampling and testing of bituminous mixtures will be accomplished by the Contracting Officer.~~

1.10 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

1.10.1 Mineral Aggregates

Mineral aggregates shall be delivered to the site of the bituminous mixing plant and stockpiled in such manner as to preclude fracturing of aggregate particles, segregation, contamination, or intermingling of different materials in the stockpiles or cold-feed hoppers. Mineral filler shall be delivered, stored, and introduced into the mixing plant in a manner to preclude exposure to moisture or other detrimental conditions.

1.10.2 Bituminous Materials

Bituminous materials shall be maintained at appropriate temperature during storage but shall not be heated by application of direct flame to walls of storage tanks or transfer lines. Storage tanks, transfer lines, and weigh buckets shall be thoroughly cleaned before a different type or grade of bitumen is introduced into the system. The asphalt cement shall be heated sufficiently to allow satisfactory pumping of the material; however, the storage temperature shall be maintained below 150 degrees C. (300 degrees F.)

1.11 ACCESS TO PLANT AND EQUIPMENT

The Contracting Officer shall have access at all times to all parts of the paving plant for checking adequacy of the equipment in use; inspecting operation of the plant; verifying weights, proportions, and character of materials; and checking temperatures maintained in preparation of the mixtures.

1.12 WAYBILLS AND DELIVERY TICKETS

Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified waybills and certified delivery tickets for all aggregates and bituminous materials actually used in construction.

PART 2 PRODUCTS

2.1 BITUMINOUS TOP COURSE HOT MIX

Bituminous material for the top course shall be type 8, as specified in the New York State Department of Transportation (NYSDOT) Standard Specifications, Table 401-1. Shall consist of coarse aggregate, fine aggregate, mineral filler, bituminous material, and approved additives, if required, of the qualities and in the proportions specified and shall conform to the requirements contained in paragraphs PROPORTIONING OF MIXTURE and ACCEPTABILITY OF WORK.

2.1.1 Aggregates

NOTE: Appropriate gradations from TABLE I, TM 5 822 8, will be listed in TABLE I.

2.2 BITUMINOUS BINDER COURSE

Bituminous material for the binder course shall be Type 3, as specified in NYSDOT Standard Specifications, Table 401-1.

2.3 AGGREGATE BASE COURSE

Stone for pavement aggregate base course shall meet the requirements as specified in Section 02241: AGGREGATE BASE COURSE.

2.4 JOINT FILLER

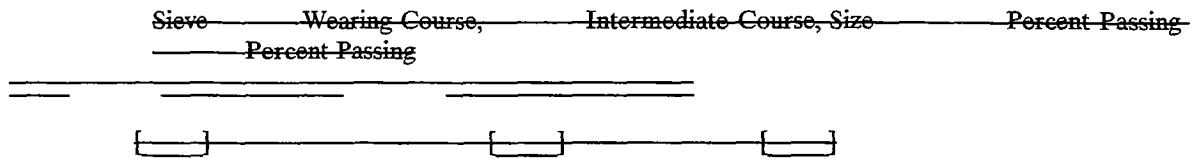
Joint filler material shall be asphalt cement, material designation 702-0700, which meets the requirements of NYSDOT Standard Specifications, "Section 702: Bituminous Materials".

2.5 TACK COAT

Tack coat material shall meet the requirements as specified in NYSDOT Standard Specifications, Section 407.

Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screening, sand, and mineral filler, as required. The portion of materials retained on the 4.75 mm (No. 4) sieve shall be known as coarse aggregate, the portion passing the 4.75 mm (No. 4) sieve and retained on the 0.075 millimeter (No. 200) sieve as fine aggregate, and the portion passing the 0.075 millimeter (No. 200) sieve as mineral filler. Aggregate gradation shall conform to gradation(s) specified in TABLE I. TABLE I is based on aggregates of uniform specific gravity; the percentage passing various sieves may be changed by the Contracting Officer when aggregates of varying specific gravities are used. Adjustments of percentage passing various sieves may be changed by the Contracting Officer when aggregates vary by more than 0.2 in specific gravity.

TABLE I. AGGREGATE GRADATION



2.1.1.1 Coarse Aggregate

NOTE: The values of percentage of loss will be based on knowledge of aggregates in the area that have been previously approved or that have a satisfactory service record in bituminous pavement construction for at least 5 years.

Coarse aggregate shall consist of clean, sound, durable particles meeting the following requirements:

- Percentage of loss shall not exceed 40 after 500 revolutions, as determined in accordance with ASTM C 131.
- Percentage of loss shall not exceed [] after five cycles performed in accordance with ASTM C 88, using magnesium sulfate.
- The dry weight of crushed slag shall not be less than 1200 kg/cubic m, (75 pcf,) as determined in accordance with ASTM C 29.
- Crushed gravel retained on the 4.75 mm (No. 4) sieve and each coarser sieve shall contain at least 75 percent by weight of crushed pieces having one or more fractured faces with the area of each face equal to at least 75 percent of the smallest midsectional area of piece. When two fractures are contiguous, the angle between planes of fractures shall be at least 30 degrees to count as two fractured faces.
- Particle shape of crushed aggregates shall be essentially cubical. The quantity of flat and elongated particles in any sieve size shall not exceed 20 percent by weight, when determined in accordance with ASTM D 4791.

2.1.1.2 Fine Aggregate

Fine aggregate shall consist of clean, sound, durable particles including natural sand or crushed stone, slag, or gravel that meets requirements for wear and soundness specified for coarse aggregate. Fine aggregate produced by crushing gravel shall have at least 90 percent by weight of crushed particles having two or more fractured faces in the portion retained on the 0.600 millimeter (No. 30) sieve. This requirement shall apply to the material before blending with natural sand when blending is necessary. Quantity of natural sand to be added to the wearing and intermediate course mixtures shall not exceed 25 percent by weight of coarse and fine aggregate and material passing the 0.075 millimeter (No. 200) sieve. Natural sand shall be clean and free from clay and organic matter. Percentage of loss shall not exceed [] after five cycles of the soundness test performed in accordance with ASTM C 88, using magnesium sulfate.

2.1.1.3 Mineral Filler

NOTE: In areas where there is a possibility that dune sand or one size material may be used as mineral filler, the following bracketed gradation requirements will be used to eliminate undesirable one size materials.

Mineral filler shall conform to ASTM D 242.

Grain size in mm Percent Finer

0.05 70-100
0.02 35-65
0.005 10-22]

[Grain size shall be determined in accordance with ASTM D 422.]

2.1.2 Bituminous Material

NOTE: The appropriate types and grades of bituminous materials for the pavement's use and climatic environment should be used. (Refer to TM 5 822 8/AFM 88 6, Chapters 2 and 9.) Military roads to be used by tracked vehicles will be designed for tire pressures of 1.38 MPa (200 psi) and above. Requirements of ASTM D 946 should be used to specify penetration graded asphalt cement, or ASTM D 3381 for viscosity graded asphalt cement.

Asphalt cement shall conform to [ASTM D 946] [ASTM D 3381], Grade [].

2.1.3 Additives

The use of additives such as antistripping and antifoaming agents is subject to approval.

2.2 PROPORTIONING OF MIXTURE

NOTE: The quantity of materials specified should be adequate for determination of acceptability of source and determination of the JMF. Adjust quantity if circumstances require more material. The procedures for determining the JMF to be used in the mixtures are described in \&\ TM 5 822 8/AFM 88 6, Chapters 2 and 9. Proportioning of the aggregates for the JMF should be carefully determined because the gradations will be those on which the Contractors' tolerances will be applied. Application of these tolerances may cause the gradation to be outside the limits of the gradation in the specification, but this is acceptable. Only those columns in TABLES III and IV showing test properties that are applicable to the project will be retained.

2.2.1 Job Mix Formula

The JMF for the bituminous mixture will be furnished the Contractor by the Contracting Officer. The Contractor shall furnish samples of materials for mix design. Blending of the aggregates will be accomplished by the Government. No payment will be made for mixtures produced prior to the approval of the JMF. The formula will indicate the percentage of each stockpile and mineral filler, the percentage of each size aggregate, the percentage of bitumen, and the temperature of the completed mixture when discharged from the mixer. Tolerances are given in TABLE II for asphalt content, temperature, and aggregate grading for tests conducted on the mix as discharged from the mixing plant; however, the final evaluation of aggregate gradation and asphalt content will be based on paragraph ACCEPTABILITY OF WORK. Bituminous mix that deviates more than 14 degrees C (25 degrees F) from the JMF shall be rejected. The JMF may be adjusted during construction to improve paving mixtures, as directed, without adjustments in the contract unit prices.

TABLE II. JOB MIX TOLERANCES

Tolerance, Material		Plus or Minus
Aggregate passing	4.75 mm sieve or larger	5 percent
Aggregate passing	2.36, 1.18, 0.6, and 0.3 mm sieves	4 percent

Aggregate passing 150 and 75 micrometer sieves _____ 2 percent
 Bitumen _____ 0.25 percent
 Temperature of mixing _____ 14 degrees C

TABLE II. JOB MIX TOLERANCES

Tolerance, Material _____ Plus or Minus _____

Aggregate passing No. 4 sieve or larger _____ 5 percent
 Aggregate passing Nos. 8, 16, 30, and 50 sieves _____ 4 percent
 Aggregate passing Nos. 100 and 200 sieves _____ 2 percent
 Bitumen _____ 0.25 percent
 Temperature of mixing _____ 25 degrees F

2.2.2 Test Properties of Bituminous Mixtures

 \&NOTE: Consult CEMP ET on test method to be used and include in this paragraph and subparagraphs below.&\

 Finished mixture shall meet requirements described below when tested in accordance with \&[]&\. All samples will be compacted with 50 blows of specified hammer on each side of sample. When bituminous mixture fails to meet the requirements specified below, the paving operation shall be stopped until the cause of noncompliance is determined and corrected.

2.2.2.1 Stability, Flow, and Voids

Requirements for stability, flow, and voids are shown in TABLES III and IV for nonabsorptive and absorptive aggregates, respectively.

TABLE III. NONABSORPTIVE AGGREGATE MIXTURE

		Intermediate Course	Wearing Course
	Stability minimum, newtons	2200	200
	Flow maximum, 25/100 millimeter units	20	
20	Voids total mix, percent (1)	3-5	
4-6	Voids filled with bitumen, percent (2)	75-85	65

TABLE III. NONABSORPTIVE AGGREGATE MIXTURE

Intermediate Course _____ Wearing Course _____

		<u>Course</u>
	Stability minimum, pounds	500
500	Flow maximum, 1/100 inch units	20
20	Voids total mix, percent (1)	3-5
4-6	Voids filled with bitumen, percent (2)	75-85
75		65

(1) The Contracting Officer may permit deviations from limits specified when gyratory method of design is used to develop the JMF.

(2) The Contracting Officer may permit deviation from limits specified for voids filled with bitumen in the intermediate course in order to stay within limits for percent voids total mix.

TABLE IV. ABSORPTIVE AGGREGATE MIXTURE

		<u>Intermediate Wearing Course</u> <u>Course</u>
	Stability minimum, newtons	2200
	Flow maximum, 25/100 millimeter units	20
20	Voids total mix, percent (1)	2-4
3-5	Voids filled with bitumen, percent (2)	80-90
80		70

TABLE IV. ABSORPTIVE AGGREGATE MIXTURE

		<u>Intermediate Wearing Course</u> <u>Course</u>
	Stability minimum, pounds	500
500	Flow maximum, 1/100 inch units	20
20	Voids total mix, percent (1)	2-4
3-5	Voids filled with bitumen, percent (2)	80-90
		70-80

(1) The Contracting Officer may permit deviations from limits specified when gyratory method of design is used to develop the JMF.

(2) The Contracting Officer may permit deviation from limits specified for voids filled with bitumen in the intermediate course in order to stay within limits for percent voids total mix.

a. ~~When the water absorption value of the entire blend of aggregate does not exceed 2.5 percent as determined in accordance with ASTM C 127 and ASTM C 128, the aggregate is designated as nonabsorptive. The theoretical specific gravity computed from the apparent specific gravity or ASTM D 2041 will be used in computing voids total mix and voids filled with bitumen, and the mixture shall meet requirements in TABLE III.~~

b. ~~When the water absorption value of the entire blend of aggregate exceeds 2.5 percent as determined in accordance with ASTM C 127 and ASTM C 128, the aggregate is designated as absorptive. The theoretical specific gravity computed from the bulk impregnated specific gravity method contained in \&\&\ ASTM D 2041 shall be used in computing percentages of voids total mix and voids filled with bitumen; the mixture shall meet requirements in TABLE IV.~~

~~2.2.2.2 Stability~~

~~NOTE: The antistripping agent when added to the mix must be able to produce an index of retained stability of at least 75 percent.~~

~~The index of retained stability must be greater than 75 percent as determined by \&[]&\. When the index of retained stability is less than 75, the aggregate stripping tendencies may be countered by the use of hydrated lime or by treating the bitumen with an approved antistripping agent. The hydrated lime is considered as mineral filler and should be considered in the gradation requirements. The amount of hydrated lime or antistripping agent added to bitumen shall be sufficient, as approved, to produce an index of retained stability of not less than 75 percent. No additional payment will be made to the Contractor for addition of antistripping agent required.~~

PART 3 EXECUTION

3.1 BASE COURSE CONDITIONING

~~NOTE: The type of base course on which the bituminous intermediate and/or wearing courses are to be constructed will be inserted in the blanks. If project does not involve construction of bituminous courses on base course, delete this paragraph.~~

The surface of the aggregate base course will be inspected for adequate compaction and surface tolerances specified in Section 02241[AGGREGATE BASE COURSE]. Unsatisfactory areas shall be corrected.

3.2 OMITTED EXISTING PAVEMENT CONDITIONING

~~NOTE: Appropriate statements covering the required conditioning of the existing pavement will be inserted.~~

3.3 PREPARATION OF BITUMINOUS MIXTURES

Rates of feed of aggregates shall be regulated so that the moisture content and temperature of aggregates will be within specified tolerances. Aggregates, mineral filler, and bitumen shall be conveyed into the mixer in

proportionate quantities required to meet the material specification IMF. Mixing time shall be as required to obtain a uniform coating of the aggregate with the bituminous material. Temperature of bitumen at time of mixing shall not exceed 150 degrees C. (300 degrees F.) Temperature of aggregate and mineral filler in the mixer shall not exceed 160 degrees C (325 degrees F) when bitumen is added. Overheated and carbonized mixtures or mixtures that foam shall not be used.

3.4 ~~OMITTED~~ WATER CONTENT OF AGGREGATES

~~Drying operations shall reduce the water content of mixture to less than 0.75 percent. The water content test will be conducted in accordance with ASTM D 2216; the weight of the sample shall be at least 500 grams. If the water content is determined on hot bin samples, the water content will be a weighted average based on composition of blend.~~

3.5 STORAGE OF BITUMINOUS PAVING MIXTURE

Storage shall conform to the applicable requirements of ASTM D 3515; however, in no case shall the mixture be stored for more than 4 hours.

3.6 TRANSPORTATION OF BITUMINOUS MIXTURE

Transportation from paving plant to site shall be in trucks having tight, clean, smooth beds lightly coated with an approved releasing agent to prevent adhesion of the mixture to the truck bodies. Excessive releasing agent shall be drained prior to loading. Each load shall be covered with canvas or other approved material of ample size to protect mixture from weather and to prevent loss of heat. Loads that have crusts of cold, unworkable material or that have become wet will be rejected. Hauling over freshly placed material will not be permitted.

3.7 SURFACE PREPARATION OF UNDERLYING COURSE

Prior to placing of the ~~binder~~ intermediate or top wearing course, the underlying course shall be cleaned of all foreign or objectionable matter with power brooms and hand brooms.

3.8 PRIME COATING

NOTE: If project does not involve construction of bituminous courses on base course, delete this paragraph.

Surfaces of previously constructed base course shall be sprayed with a coat of bituminous material approved by the Contracting Officer conforming to Section 02559 BITUMINOUS PRIME COAT.

3.9 TACK COATING

Contact surfaces of previously constructed pavement, curbs, manholes, and other structures shall be sprayed with a thin coat of bituminous material conforming to Section 407 of the NYSDOT Standard Specifications 02558 BITUMINOUS TACK COAT.

3.10 PLACING

Bituminous courses shall be constructed only when the base course or existing pavement has no free water on the surface. Bituminous mixtures shall not be placed without ample time to complete spreading and rolling during daylight hours, unless approved satisfactory artificial lighting is provided.

3.10.1 Offsetting Joints

The wearing course shall be placed so that longitudinal joints of the wearing course will be offset from joints in the intermediate course by at least 300 mm. (1 foot.) Transverse joints in the wearing course shall be offset by

at least 600 mm (2 feet) from transverse joints in the intermediate course.

3.10.2 General Requirements for Use of Mechanical Spreader

Range of temperatures of mixtures, when dumped into the mechanical spreader, shall be as determined by the Contracting Officer. Mixtures having temperatures less than 110 degrees C (225 degrees F) when dumped into the mechanical spreader shall not be used. The mechanical spreader shall be adjusted and the speed regulated so that the surface of the course being laid will be smooth and continuous without tears and pulls, and of such depth that, when compacted, the surface will conform to the cross section indicated. Placing with respect to center line areas with crowned sections or high side of areas with one-way slope shall be as directed. Each lot of material placed shall conform to requirements specified in paragraph ACCEPTABILITY OF WORK. Placing of the mixture shall be as nearly continuous as possible, and speed of placing shall be adjusted, as directed, to permit proper rolling. When segregation occurs in the mixture during placing, the spreading operation shall be suspended until the cause is determined and corrected.

3.10.3 Placing Strips Succeeding Initial Strips

In placing each succeeding strip after initial strip has been spread and compacted as specified below, the screed of the mechanical spreader shall overlap the previously placed strip 50 to 75 mm (2 to 3 inches) and be sufficiently high so that compaction produces a smooth dense joint. Mixture placed on the edge of a previously placed strip by the mechanical spreader shall be pushed back to the edge of the strip by use of a lute. Excess mixture shall be removed and wasted.

3.10.4 Handspreading in Lieu of Machine Spreading

In areas where the use of machine spreading is impractical, the mixture shall be spread by hand. Spreading shall be in a manner to prevent segregation. The mixture shall be spread uniformly with hot rakes in a loose layer of thickness that, when compacted, will conform to required grade, density, and thickness.

3.11 COMPACTION OF MIXTURE

Rolling shall begin as soon after placing as the mixture will bear a roller without undue displacement. Delays in rolling freshly spread mixture will not be permitted. After initial rolling, preliminary tests of crown, grade, and smoothness shall be made by the Contractor. Deficiencies shall be corrected so that the finished course will conform to requirements for grade and smoothness specified herein. Crown, grade, and smoothness will be checked in each lot of completed pavement by the Contracting Officer for compliance and will be evaluated as specified in paragraph ACCEPTABILITY OF WORK. After the Contractor is assured of meeting crown, grade, and smoothness requirements, ~~compaction and rolling shall be continued in accordance with NYSDOT Standard Specification, Section 401.3.12 until a mat density of 97.0 to 100.0 percent and a joint density of 95.0 to 100.0 percent of density of laboratory compacted specimens of the same mixture is obtained. The density will be determined and evaluated as specified in paragraph ACCEPTABILITY OF WORK.~~ Places inaccessible to rollers shall be thoroughly compacted with hot hand tampers.

3.11.1 ~~OMITTED~~ Testing of Mixture

~~At the start of the plant operation, a quantity of mixture shall be prepared that is sufficient to construct a test section at least 15 m (50 feet) long, two spreader widths wide and of thickness to be used in the project. Mixture shall be placed, spread, and rolled with equipment to be used in the project and in accordance with the requirements specified above. This test section shall be tested and evaluated as a lot and shall conform to all specified requirements. If test results are satisfactory, the test section shall remain in place as part of the completed pavement. If tests indicate that the pavement does not conform to specification requirements, necessary adjustments to plant operations and rolling procedures shall be made immediately, and test section will be evaluated as specified in paragraph ACCEPTABILITY OF WORK. Additional test sections, as directed, shall be constructed and sampled for conformance to specification requirements. In no case shall the Contractor start full production of an intermediate or wearing course mixture without approval.~~

3.11.2 Correcting Deficient Areas

Mixtures that become contaminated or are defective shall be removed to the full thickness of the course. Edges of the area to be removed shall be cut so that sides are perpendicular and parallel to the direction of traffic and so that the edges are vertical. Edges shall be sprayed with bituminous materials conforming to the requirements for bituminous tack coat to Section 02558 BITUMINOUS TACK COAT. Fresh paving mixture shall be placed in the excavated areas in sufficient quantity so that the finished surface will conform to grade and smoothness requirements. Paving mixture shall be compacted to the density specified herein. Skin patching of an area that has been rolled shall not be permitted.

3.12 JOINTS

3.12.1 General

Joints between old and new pavements, between successive work days, or joints that have become cold (less than 80 degrees C (175 degrees F)) shall be made to insure continuous bond between the old and new sections of the course. All joints shall have the same texture and smoothness as other sections of the course. Contact surfaces of previously constructed pavements coated by dust, sand, or other objectionable material shall be cleaned by brushing or shall be cut back as directed. When directed by the Contracting Officer, the surface against which new material is placed shall be sprayed with a thin, uniform coat of bituminous material conforming to the requirements for bituminous tack coats, Section 02558 BITUMINOUS TACK COAT. Material shall be applied far enough in advance of placement of a fresh mixture to insure adequate curing. Care shall be taken to prevent damage or contamination of the sprayed surface.

3.12.2 Transverse Joints

The roller shall pass over the unprotected end of a strip of freshly placed material only when placing is discontinued or delivery of the mixture is interrupted to the extent that the material in place may become cold. In all cases, prior to continuing placement, the edge of previously placed pavement shall be cut back to expose an even vertical surface for full thickness of the course. In continuing placement of a strip, the mechanical spreader shall be positioned on the transverse joint so that sufficient hot mixture will be spread to obtain a joint after rolling that conforms to the required density and smoothness specified herein.

3.12.3 Longitudinal Joints

Edges of a previously placed strip shall be prepared such that the pavement in and immediately adjacent to the joint between this strip and the succeeding strip meets the requirements for grade, smoothness, and density specified in paragraph ACCEPTABILITY OF WORK.

3.13 ACCEPTABILITY OF WORK

3.13.1 OMITTED General

NOTE: The lot size can be specified on the basis of time (i.e., 4 hours, 1 day, etc.) or amount of production (i.e., 500 metric tons (tons), 1,000 metric tons (tons), etc.). If the lot size is based on the amount or production, it should be selected to be approximately equal to the amount of asphalt mix produced in one day's operation. The lot size should not exceed 2000 metric tons (tons) of asphalt mix. When a lump sum contract is used (total job does not exceed 1000 metric tons (tons)), the lot size becomes the total job; thus the penalty is assessed to the contract price.

A lot shall be that quantity of construction that will be evaluated for compliance with specification requirements. A lot shall be equal to [] metric tons (tons) [] hours of production. The Government will conduct all initial acceptance tests. Additional tests required to determine acceptability of nonconforming material will be performed by the Government at the expense of the Contractor.

3.13.1.1 Lot Evaluation

~~NOTE: Consult CEMP-ET on test method to be used and include below.~~

In order to evaluate aggregate gradation, asphalt content, and density, each lot shall be divided into four equal sublots. For density determination, one random sample shall be taken from the mat, and one random sample shall be taken from the joint of each subplot. A coring machine will be used for taking mat and joint samples from the completed pavement. Core samples will be taken with the coring machine centered over the joint. After air drying to a constant weight, random samples obtained from the mat shall be used for density determination in accordance with ~~and []~~. Samples for determining asphalt content and aggregate gradation shall be taken from loaded trucks within each subplot. Asphalt content shall be determined in accordance with ASTM D 2172, Method A or B. Aggregate gradation shall be determined for the mix by testing the recovered aggregate in accordance with ASTM C 136 and ASTM C 117.

3.13.1.2 Lot Failure

When a lot of material fails to meet the specification requirements, that lot shall be removed and replaced or accepted at a reduced price. The lowest percent payment for any pavement characteristic (i.e., gradation, asphalt content, density, grade, and smoothness) defined below shall be the percent payment for that lot. The percent payment is based on the pavement characteristics and the contract unit price.

3.13.1.3 Optional Sampling and Testing

The Contracting Officer reserves the right to sample and test any area which appears to deviate from the specification requirements. Testing in these areas will be in addition to the lot testing, and the requirements for these areas will be the same as those for a lot.

3.13.2 Aggregate Gradation

The mean absolute deviation of the four subplot aggregate gradations from the JMF for each sieve size will be evaluated and compared with TABLE V. The percent payment based on aggregate gradation shall be the lowest value determined for any sieve size in TABLE V. All tests for aggregate gradation will be completed and reported within 24 hours after completion of construction of each lot. The computation of mean absolute deviation for one sieve size is illustrated below:

Example: Assume the following JMF and subplot test results for aggregate gradation

Percent by Weight Passing Sieves					
Sieve Size	JMF	Test No. 1	Test No. 2	Test No. 3	Test No. 4
19 mm	100	100	100	100	100
12.5 mm	88	87	88	90	88
9.5 mm	75	72	77	78	74
4.75 mm		64		60	65
2.36 mm		53		50	56
1.18 mm		42		39	44
0.600 mm		32		30	34
0.300 mm		20		17	20
0.150 mm		10		8	10
0.075 mm		6		4	7
					8.6

(

Percent by Weight Passing Sieves

Sieve Size	JMF	Test No. 1	Test No. 2	Test No. 3	Test No. 4	
3/4 inch	100	100	100	100	100	
1/2 inch	88		87		88	9088
3/8 inch	75		72		77	7874
No. 4	64		60		65	6762
No. 8	53		50		56	5752
No. 16	42		39		44	4541
No. 30	32		30		34	3532
No. 50	20		17		20	2221
No. 100	10		8		10	1011
No. 200	6		4		7	86

)

Mean Absolute Deviation (for 75 micrometer (No. 200) sieve) = ((Absolute value of 4.6) + (Absolute value of 7.6) + (Absolute value of 8.6) + (Absolute value of 6.6))/4 = (2 + 1 + 2 + 0)/4 = 1.25

The mean absolute deviation for other sieve sizes can be determined in a similar way for this example to be:

Sieve Size	19 mm	12.5 mm	9.5 mm	4.75 mm	2.36 mm	1.18 mm	0.600 mm	0.300 mm	0.075 mm
Mean Absolute Deviation	0	0.75	2.25	2.50	2.75	2.25	1.75	1.50	0.75

(

Sieve Size	3/4 inch	1/2 inch	3/8 inch	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100
Mean Absolute Deviation	0	0.75	2.25	2.50	2.75	2.25	1.75	1.50	0.75

)

The least percent payment based on any sieve size listed in TABLE V would be 98 percent for the 75 micrometer (No. 200) sieve. Therefore for this example the percent payment based on aggregate gradation is 98 percent.

TABLE V. PERCENT PAYMENT BASED ON MEAN ABSOLUTE DEVIATION OF AGGREGATE GRADATIONS FROM JMF

Sieve Size	0.0	1.0	1.1	2.0	2.1	3.0	3.1	4.0	4.1	5.0	5.1	6.0	Above 6.0
19 mm	100	100	100	100	100	98	9590						
12.5 mm	100	100	100	100	100	98	9590						

9.5 mm	100	100	100	100	98	9590
4.75 mm	100	100	100	100	98	9590
2.36 mm	100	100	100	98	95	90reject
1.18 mm	100	100	100	98	95	90reject
0.600 mm	100	100	100	98	95	90reject
0.300 mm	100	100	100	98	95	90reject
0.150 mm	100	98	95	90	90	rejectreject
0.075 mm	100	98	90	reject	reject	reject

(

TABLE V. PERCENT PAYMENT BASED ON MEAN ABSOLUTE DEVIATION
OF AGGREGATE GRADATIONS FROM JMF Sieve Percent

Payment Based On Mean Absolute Deviation from JMF

Size	0.0	1.0	1.1	2.0	2.1	3.0	3.1	4.0	4.1	5.0	5.1	6.0	Above 6.0
3/4 inch	100					100		100		98		9590	
1/2 inch	100					100		100		98		9590	
3/8 inch	100					100		100		98		9590	
No. 4	100					100		100		98		9590	
No. 8	100					100		98		95		90reject	
No. 16	100					100		98		95		90reject	
No. 30	100					100		98		95		90reject	
No. 50	100					100		98		95		90reject	
No. 100	100					98		95		90		90	rejectreject
No. 200	100					98		90	reject	reject	reject	reject	

)

3.13.3 Omitted Asphalt Content

The mean absolute deviation of the four asphalt contents from the JMF will be evaluated and compared with TABLE VI. The percent payment based on asphalt content shall be the value determined in TABLE VI. Asphalt content tests shall be completed and reported within 24 hours after construction of the lot.

TABLE VI. PERCENT PAYMENT BASED ON ASPHALT CONTENT

Mean Absolute Deviation of Extracted Asphalt Content from JMF	Percent Payment
less than 0.25	100
0.25 0.30	98
0.31 0.35	95
0.36 0.40	90
above 0.40	reject

3.13.4 Omitted Density

&NOTE: Consult CEMP ET on test method to be used and include below.&\

The average mat and joint densities will be expressed as a percentage of the laboratory density. The laboratory density for each lot will be determined in accordance with \&[]&\ from four sets of laboratory samples. One sample will be obtained from each of the four sublots and will be divided into three specimens to produce one set of laboratory samples. Laboratory samples will be prepared from asphalt mixture which has not been reheated. Samples will be compacted at 121.1 degrees C (250 degrees F) (250 degrees F) within 2 hours of the time the mixture was prepared at the asphalt plant. Laboratory samples will be prepared in accordance with \&[]&\.

3.13.4.1 Field Density

The field density will be determined and compared with TABLE VII. The percent payment based on density shall be the lowest value determined from TABLE VII. The percent payment based on mat density will be for all of the material placed in the lot. The percent payment based on joint density will be for the amount of material represented by an area equal to the lot joint length by 3 m (10 feet) wide not to exceed the lot size.

TABLE VII. PERCENT PAYMENT BASED ON DENSITY

Average Mat Density	Percent	Average Joint Density (4 Cores)	Payment
(4 Cores)			
97.0 100.0	100.0	95.0 100.0	
96.9		100.0	94.9
96.8 100.1	99.9	94.8	
96.7		99.8	94.7
96.6 100.2	99.6	94.6	
96.5		99.4	94.5
96.4 100.3	99.1	94.4	
96.3		98.7	94.3
96.2 100.4	98.3	94.2	
96.1		97.8	94.1
96.0 100.5	97.3	94.0	
95.9		96.3	93.9
95.8 100.6	94.1	93.8	
95.7		92.2	93.7
95.6 100.7	90.3	93.6	
95.5		87.9	93.5
95.4 100.8	85.7	93.4	
95.3		83.3	93.3
95.2 100.9	80.6	93.2	
95.1		78.0	93.1
95.0 101.0	75.0	93.0	
below 95.0, above 101.0	reject	below 93.0	

3.13.4.2 Lot Density

All density results on a lot will be completed and reported within 24 hours after construction of that lot. When the Contracting Officer considers it necessary to take additional samples for density measurements, samples will be taken in groups of four (one for each subplot). The percent payment will be determined for each additional group of four samples and averaged with the percent payment for the original group to determine the final percent payment. The Contractor shall fill all sample holes with hot mix and compact.

3.13.5 Grade

Grade-conformance tests will be conducted by the Government. The finished surface of the pavement will be tested for conformance with plan-grade requirements. Within 5 working days after completion of placement of a particular lot, the Contracting Officer will inform the Contractor in writing of results of grade-conformance tests. The finished grade of each pavement area shall be determined by running lines of levels at intervals of 8 m (25 feet) or less longitudinally and transversely to determine the elevation of the completed pavement. When more than 5 percent of all measurements made within a lot are outside the tolerances specified in paragraph GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS, the payment for that lot will not exceed 95 percent of the bid price. In areas where the grade exceeds the plan-grade tolerances given in paragraph GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS by more than 50 percent, the Contractor shall remove the deficient area and replace with fresh paving mixture at no additional cost to the Government. Sufficient material shall be removed to allow at least 1 inch of asphalt concrete to be placed. Skin patching for correcting low areas or planing for correcting high areas shall not be permitted.

3.13.6 Surface Smoothness

After completion of final rolling of a lot, the compacted surface will be tested by the Contracting Officer with a 3.66 m (12-foot) (12-foot) straightedge. Measurements will be made perpendicular to and across all mats at distances along the mat not to exceed 8 m. (25 feet.) Location and deviation from straightedge of all measurements will be recorded. When more than 5 percent of all measurements along the mat within a lot exceed the specified tolerance, the unit price for that lot shall not exceed 95 percent of the bid price. Any joint or mat area surface deviation which exceeds the tolerance given in paragraph GRADE AND SURFACE-SMOOTHNESS REQUIREMENTS by more than 50 percent shall be corrected to meet the specification requirements. The Contractor shall remove the deficient area and replace with fresh paving mixture at no additional cost to the Government. Sufficient material shall be removed to allow at least 25 mm (1 inch) of asphalt concrete to be placed. Skin patching for correcting low areas or planing for correcting high areas shall not be permitted.

-- End of Section --

LAKE ONTARIO ORDNANCE WORKS
LEWISTON AND PORTER, NY

DEPARTMENT OF THE ARMY _____ CEGS 02935 (June 1990)
U.S. ARMY CORPS OF ENGINEERS _____

Superseding
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GUIDE SPECIFICATION FOR MILITARY CONSTRUCTION

~~Includes note relocation Special change (August 1995)~~

~~Includes changes through Notice 4 (April 1994)~~

~~Includes Text Adjustment change 1 (June 1991)~~

~~Latest Notice change indicated by \&\ tokens~~

SECTION 02935

TURF

06/90

~~NOTE: This guide specification covers the requirements for seeding, sodding, and sprigging to establish grassed areas. This guide specification is to be used in the preparation of project specifications in accordance with ER 1110-345-720.~~

PART 1 GENERAL

~~NOTE: This guide specification is intended for use where turf is required. Areas to be turfed must be shown or defined. Project drawings should clearly indicate all areas to be turfed and if more than one method of turfing is specified, drawings will delineate areas for each method.~~

1.1 REFERENCES

~~NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change (Notice) to this guide specification.~~

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01 (Amended thru: Aug 1988) Federal Seed Act Regulations (Part 201-202)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 977 (1991) Emulsified Asphalt

ASTM D 2028 (1976; R 1992) Cutback Asphalt (Rapid-Curing Type)

ASTM D 2607 (1969) Peats, Mosses, Humus, and Related Products

COMMERCIAL ITEM DESCRIPTIONS (CID)

CID A-A-1909 ~~Basic; Notice 1~~ Fertilizer
~~&&~~

1.2 SUBMITTALS

~~NOTE: Submittals must be limited to those necessary or adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.~~

~~Indicate submittal classification in the blank space using "GA" when the submittal requires Government approval or "FIO" when the submittal is for information only.~~

~~SD-13: Adjust the certification requirements for all materials to suit local conditions. List additional specified materials that require certification.~~

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

1.2.1 SD-01 Data

Manufacturer's Literature; ~~FIO~~ ☐.

Manufacturer's literature discussing physical characteristics, application and installation instructions for erosion control material, and for chemical treatment material.

1.2.2 SD-07 Schedules

Equipment List; ~~FIO~~ ☐.

A list of proposed pesticide application, seeding and mulching equipment to be used in performance of turfing operation, including descriptive data and calibration tests.

1.2.3 SD-08 Statements

Delivery; ~~FIO~~ ☐.

Delivery schedule, at least 10 days prior to the intended date of the first delivery.

Application of Pesticide; ☐.

~~Pesticide treatment plan with proposed sequence of pesticide treatment work. The pesticide trade name, chemical composition, formulation, concentration, application rate of active ingredients and method of application for all materials; and the name and state license number of the state certified applicator shall be included.~~

Maintenance Report; ☐.

~~Written record of maintenance work performed.~~

~~Turf Establishment Period; ☐.~~

~~Written calendar time period for the turf establishment period. When there is more than one turf establishment period, the boundaries of the turfed area covered for each period shall be described.~~

1.2.4 SD-13 Certificates

Certificates of compliance and certified laboratory test reports certifying that materials meet the requirements specified, prior to the delivery of materials. Certified copies of the reports for the following materials shall be included:

Seed; FIO[].

For mixture, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, date tested and state certification.

Sod; [].

~~For species, mixture percentage, percent purity, field location.~~

Sprigs; [].

~~For cultivar, genetic purity, field location.~~

Fertilizer; FIO[].

For chemical analysis, composition percent.

Agricultural Limestone; FIO[].

For calcium carbonate equivalent and sieve analysis.

Peat; [].

~~For compliance with ASTM D 2607.~~

Asphalt Adhesive; [].

~~For compliance with ASTM D 977 and ASTM D 2028.~~

Pesticide Material; [].

~~For EPA registration number and registered uses.~~

Topsoil; FIO[].

For pH, particle size, chemical analysis and mechanical analysis.

1.3 OMITTEDSOURCE INSPECTIONS

~~[Sod] [and] [sprigging] material will be subject to inspection by the Contracting Officer at the growing site.~~

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

1.4.1.1 ~~OMITTED~~ Protection

~~Sod and/or sprigs shall be protected from drying out and contamination during delivery.~~

1.4.1.21 Topsoil

A soil test shall be provided for topsoil delivered to the site.

1.4.1.32 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.1.4 ~~OMITTED~~ Pesticide

~~Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration number and the manufacturer's registered uses.~~

1.4.2 Inspection

~~Seed, and topsoil and/or sprigs shall be inspected upon arrival at the job site by the Contracting Officer for conformity to type and quality in accordance with paragraph MATERIALS. Other materials shall be inspected for meeting specified requirements and unacceptable materials shall be removed from the job site.~~

1.4.3 Storage

~~Materials shall be stored in areas designated by the Contracting Officer. [Sod] [sprigs] shall be lightly sprinkled with water, covered with moist burlap, straw, or other covering and protected from exposure to wind and direct sunlight until planted. Covering for [sod] [sprigs] shall allow air to circulate and prevent internal heat from building up.~~ Seed, lime and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment materials shall not be stored with other landscape materials.

1.4.4 Handling

1.4.4.1 Materials

~~Care shall be taken to avoid injury to sod and/or sprigs. Except for bulk deliveries (or actual application spreading), materials shall not be dropped or dumped from vehicles. Bulk deliveries will be stored in a building, container, or on plastic.~~

1.4.4.2 ~~OMITTED~~ Time Limitation

- ~~a. Sod: Limitation of the time between harvesting and placing of sod shall be 36 hours.~~
- ~~b. Sprigs: Limitation of time between harvesting and placing of sprigs shall be 24 hours.~~

PART 2 PRODUCTS

2.1 MATERIALS

~~NOTE: Select seed, sod and/or sprigs.~~

2.1.1 Seed

~~NOTE: State certified seed is more stringently monitored than State approved seed, and therefore, more expensive.~~

2.1.1.1 Seed Classification

~~{State certified} {State approved} seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws.~~

2.1.1.2 Seed Mixtures

~~NOTE: Label the seed mixtures for each type of turf area, lawn area and field area. Lawn areas are highly maintained and have frequent mowings. Field areas are low maintenance areas with a maximum of one mowing per season.~~

Permanent seed mixtures and application rates shall conform to the following table be proportioned by weight as follows:

Botanical Name Common Name by Weight		Mixture Percent	Percent Pure		
				Live Seed	
Name	Variety	Min Purity (%)	Min Germination (%)	Application Rate	Allowable Seeding Dates
Tall Fescue, Plus	Kentucky 31	95	80	35#/Acre	April to May 31, August 15 to October 15
Redtop, Plus	Common	92	80	5#/Acre	
Birdsfoot Trefoil	Use half Empire, Dawn, or Leo Variety and half Viking or European source.	98	80	10#/Acre	

2.1.1.3 Quality

~~&&~~ Weed seed shall not exceed 0.51 percent by weight of the total mixture.

Seed shall be clean, fresh, free of deleterious material, and delivered to the site in the original, unopened bags showing net weight, composition of mix, date of germination tests, supplier's name and guarantee of analysis. Seed shall conform to applicable State and Federal regulations as in effect on the date of invitation to bid. Live seed crop plants other than those specified shall not be utilized. Prohibited noxious weeds including

Johnsongrass or Johnsongrass crosses, Canada thistle, and quackgrass; restricted noxious weeds include wild garlic and wild onion, bermuda grass, annual bluegrass, corn cockle, dodder and bindweed.

The Contractor shall furnish a certified report from an approved seed testing laboratory not engaged in selling seed showing a test for purity, viability and weed seed content of representative samples of the grass seed before it is mixed; witness the mixing operations; and shall immediately seal all bags of mixed seed. The price bid shall include the cost of laboratory charges. No grass seed shall be delivered until the approval of samples by the Contracting Officer; but such approval shall not constitute final acceptance. The Contracting Officer reserves the right to reject on or after delivery any material which in his opinion does not meet these specifications.

Wet, moldy, or otherwise damaged seed shall be rejected.

2.1.1.4 ~~OMITTED~~Overseed for Sprigs:

~~NOTE: Select overseeding for sprigs when required.~~

Overseed for sprigs shall be as follows:

	Percent Pure
Botanical Name — Common Name Live Seed	
_____	_____
_____	_____
_____	_____

2.1.1.5 Temporary Seed

The temporary seed mixture and application rates for erosion control shall conform to the following table: be as follows:

	Percent Pure
Botanical Name — Common Name Live Seed	
_____	_____
_____	_____
_____	_____

Name	Variety	Min Purity (%)	Min Germination (%)	Application Rate	Allowable Seeding rates
Annual Rye Grass,	Common	95	85	40#/Acre	March 15
or					to
Winter Rye	Arcoostook	95	85	100#/Acre	October 15

2.1.1.6 Seed-Mixing

The field mixing of seed shall be performed on site in the presence of the Contracting Officer.

2.1.2 ~~OMITTED~~Sod

~~NOTE: Select sod and/or sprigs as required. The specific species, variety or cultivar specified should meet local growing conditions. Label the turf to be used for lawn areas, overseeding or field areas, when appropriate. The~~

turf areas must be shown or defined on the drawings. State certified sod is more stringently monitored than State approved sod, and therefore, more expensive. Nursery grown sod is any sod grown specifically for sod purposes and has quality uniformity.

2.1.2.1 ~~OMITTED~~ Sod Classification

~~{State certified} {State approved} {Nursery grown} sod shall be provided as classified by applicable state laws. Each individual sod section shall be of a size to permit rolling and lifting without breaking.~~

2.1.2.2 ~~OMITTED~~ Grass Species

Grass species shall be proportioned as follows:

Botanical Name	Common Name	Mixture Percent

2.1.2.3 ~~OMITTED~~ Quality

~~The sod shall be relatively free of thatch, diseases, nematodes, soil borne insects, weeds or undesirable plants, stones larger than 50 mm (2 inches) in any dimension, woody plant roots and other material detrimental to a healthy stand of turf. Sod that has become dry, moldy, or yellow from heating, or has irregularly shaped pieces of sod and torn or uneven ends shall be rejected.~~

2.1.2.4 ~~OMITTED~~ Thickness

~~Sod shall be machine cut to a uniform thickness of 30 mm (1 1/4 inches) within a tolerance of 5 mm, (1/4 inch,) excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch.~~

2.1.2.5 ~~OMITTED~~ Anchors

~~Sod anchors shall be as recommended by the sod supplier.~~

2.1.3 ~~OMITTED~~ Sprigs

2.1.3.1 ~~Plantings~~

~~The cultivar of [] shall be provided as healthy living stems, stolons, or rhizomes with attached roots, including two to three nodes, and shall be from 100 to 150 mm (4 to 6 inches) long, without adhering soil.~~

2.1.3.2 ~~Quality~~

~~Sprigs shall be provided which have been grown under climatic conditions similar to those in the locality of the project. Sprigs shall be obtained from heavy and dense sod, free from weeds or other material detrimental to a healthy stand of turf. Sprigs that have been exposed to heat or excessive drying shall be rejected.~~

2.1.4 Soil Amendments

NOTE: The type and quantity of soil amendments should be determined by soil test; however, field experience or recommendations by the Department of Agriculture County Extension Service may be used to determine the

~~required mixtures for meeting local soil conditions. Allow Contractor option for selection of soil amendments. Vermiculite is not recommended.~~

~~*****~~

Soil amendments shall consist of lime ~~and~~ fertilizer, ~~organic soil amendments and soil conditioners meeting the following requirements.~~

2.1.4.1 Lime

Lime shall be agricultural limestone and shall have a minimum calcium carbonate equivalent of ~~88~~90 percent and shall be ground to such a fineness that at least 90 percent will pass a 10-mesh sieve and at least 50 percent will pass a 60-mesh sieve.

2.1.4.2 Fertilizer

Fertilizer shall be commercial grade, free flowing, uniform in composition and conforming to CID A-A-1909. Granular Fertilizer: ~~{As recommended by the soil test. In lieu of soil testing, }~~ ~~{Consists of nitrogen-phosphorus-potassium ratio: 5{ } percent nitrogen 10{ } percent phosphorus, and 10{ } percent potassium.}~~ ~~{Consists of nitrogen carrier of { }.~~

2.1.4.3 Organic Soil Amendments

- a. ~~Topsoil: The existing surface soil shall be stripped and stockpiled on the site in accordance with Section 02210 GRADING. When required beyond that available from stripping, the topsoil shall be delivered. Delivered topsoil shall conform to topsoil requirements specified in Section 02210 GRADING, and shall be amended as recommended by soil test.~~
- b. ~~Peat: {Peat moss} {Hypnum moss peat} {Reed sedge peat} {Peat humus} derived from a bog, swampland or marsh shall conform to ASTM D 2607.~~
- c. ~~Sand: Clean, free of toxic materials; 95 percent by weight shall pass a No. 10 sieve (No. 10 sieve) and 10 percent by weight shall pass a No. 16 sieve. (No. 16 sieve.)~~
- d. ~~Rotted Manure: Well rotted, horse or cattle manure containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials, free of stones, sticks, soil and containing no chemicals or ingredients harmful to plants.~~
- e. ~~Decomposed Wood Derivatives: Ground bark, sawdust, or other wood waste material free of stones, sticks, soil, and toxic substances harmful to plants, stabilized with nitrogen and having the following properties:~~

~~Particle Size: Minimum percent by weight passing:
Sieve Size Percent~~

No. 4	95	No. 4	80	Nitrogen Content: Minimum percent
based on dry weight:				
Material	Percent			
		Redwood Sawdust	0.5	rF
Sawdust	0.7			
		Fir or Pine Bark	1.0	

~~f. Calcined Clay: Granular particles produced from montmorillonite clay calcined to minimum temperature of 650 degrees C (1200 degrees F) to the following gradation: minimum 90 percent passing No. 8, (No. 8,) 99~~

~~percent retained on No. 60 sieve (No. 60 sieve) and maximum 2 percent passing No. 100 sieve. (No. 100 sieve.)~~
~~Bulk density: maximum 640 kg per cubic m. (40 pounds per cubic foot.)~~

2.1.4.4 ~~OMITTED~~ Soil Conditioner

~~Soil conditioner shall be for single use or in combination to meet requirements for topsoil. Gypsum shall be commercially packaged, free flowing, minimum 95 percent calcium sulfate by volume.~~

2.1.5 Mulch

Mulch shall be free from weeds, mold, and other deleterious materials.

2.1.5.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.1.5.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.1.5.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate visual metering during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.1.5.4 Wood Chips

Wood chips shall be chips or shredded bark with maximum particle size of ~~5 mm.~~ (3/16 inch.)

2.1.5.5 Paper Fiber Mulch

Paper fiber mulch shall be recycled news print that is shredded for the purpose of mulching seed.

2.1.6 Asphalt Adhesive

Asphalt adhesive shall conform to the following:

2.1.6.1 Emulsified Asphalt

Conforming to ASTM D 977, Grade SS-1.

2.1.6.2 Cutback Asphalt

Conforming to ASTM D 2028, designation RC-70.

2.1.7 Water

***** NOTE: When water is Government furnished, locate the source.

Water shall not contain elements toxic to plant life.

2.1.8 ~~OMITTED~~Pesticide

~~Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide and miticide. For the purpose of this specification, soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved [insecticide,] [herbicide,] [fungicide,] [nematocide,] [rodenticide,] [miticide,] [and] [soil fumigant].~~

2.1.9 Erosion Control Material

~~NOTE: Allow Contractor option for type of erosion control material to be used, unless the contract requirements indicate otherwise.~~

Soil erosion control shall conform to the following:

2.1.9.1 Soil Erosion Control Blanket

Machine produced mat of wood excelsior formed from a web of interlocking wood fibers, covered on one side with either knitted straw blanket-like mat construction, covered with biodegradable plastic mesh, or interwoven biodegradable thread, plastic netting or twisted kraft paper cord netting.

2.1.9.2 Soil Erosion Control Fabric

Knitted construction of polypropylene yarn with uniform mesh openings 20 to 25 mm (3/4 to 1 inch square) with strips of biodegradable paper. Filler paper strips shall last 6 to 8 months.

2.1.9.3 Soil Erosion Control Net

Heavy, twisted jute mesh weighing approximately 605 grams per meter (1.22 pounds per yard) (1.22 pounds per linear yard) and 1200 mm (4 feet) wide with mesh openings of approximately 25 mm. (1 inch square.)

2.1.9.4 ~~OMITTED~~Soil Erosion Control Chemicals

~~High polymer synthetic resin or cold water emulsion of selected petroleum resins.~~

2.1.9.5 ~~OMITTED~~Hydrophilic Colloids

~~Hydrophilic colloids shall be physiologically harmless to plant and animal life, without phytotoxic agents. Colloids shall be naturally occurring, silicate powder based, and shall form a water insoluble membrane after curing. Colloids must resist mold growth.~~

2.1.9.6 Anchors

Erosion control anchor material shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 SEEDING, SODDING AND SPRIGGING TIMES AND CONDITIONS

NOTE: ~~Specify seeding, sodding and sprigging times as determined by field experience or as recommended by the Department of Agriculture County Extension Service for the species, variety and cultivar specified and to meet local growing conditions.~~

3.1.1 Seeding Time

Seed shall be sown in accordance with the periods as specified in Tables in part 2.1.1.2 and 2.1.1.5, from [] to [] for [spring] [summer] planting and from [] to [] for fall planting.

3.1.2 ~~OMITTED~~Sodding Time

Sod shall be placed from [] to [] for [spring] [summer] planting and from [] to [] for fall planting.

3.1.3 ~~OMITTED~~Sprigging Time

Sprigs shall be planted from [] to [] for [spring] [summer] planting and from [] to [] for fall planting.

3.1.4 Turfing Conditions

Turf operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or other unsatisfactory conditions prevail, the work shall be stopped when directed. When special conditions warrant a variance to the turf operations, proposed times shall be submitted to and approved by the Contracting Officer.

3.2 SITE PREPARATION

3.2.1 Grading

NOTE: ~~When stockpiled topsoil is limited, define the areas that will use this soil. It is not necessary to topsoil all areas to be turfed. The smooth graded areas can be amended with soil amendments to meet local growing conditions for the turf specified, and this procedure may be more cost effective. Coordinate the topsoil requirements with Section 02210 GRADING and Section 02950 TREES, SHRUBS, GROUNDCOVERS, AND VINES.~~

The Contracting Officer shall verify that finished grades are as indicated on drawings, and the placing of topsoil and the smooth grading has been completed in accordance with Section 02210 GRADING.

3.2.2 Application of Soil Amendments

3.2.2.1 Soil Test

A soil test shall be performed for pH, chemical analysis and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of turf specified.

3.2.2.2 Lime

Lime shall be applied at the rate {recommended by the soil test. In lieu of a soil test, lime shall be applied at the rate of 92 pounds per 1,000 ft², 2 tons per acre, on all areas which will receive permanent seeding.} {of [] kilograms per hectare (pounds per acre)} {of [] kilograms per hectare. (pounds per 1000 square feet.]} Lime shall be incorporated into the soil to a minimum depth of 100 mm (4 inches) or may be incorporated as part of the tillage operation.

3.2.2.3 Fertilizer

Fertilizer shall be applied at the rate {recommended by the soil test.} {of [] kilograms per hectare (pounds per acre)} {of [] kilograms per hectare. (pounds per 1000 square feet.]} In lieu of a soil test, fertilizer shall be applied at the rate of 14 pounds per 1000 square feet, or 600 pounds per acre, on all areas which will receive permanent seeding. Fertilizer shall be incorporated into the soil to a minimum depth of 100 mm (4 inches) and may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.4 ~~OMITTED~~ Soil Conditioner

Soil Conditioner shall be spread uniformly over the soil to a minimum depth of [] millimeters (inches) and thoroughly incorporated by tillage into the soil to a minimum depth of 100 mm. (4 inches.)

3.2.3 ~~OMITTED~~ Tillage

3.2.3.1 ~~Minimum Depth~~

~~Soil on slopes gentler than 3 horizontal to 1 vertical shall be tilled to a minimum depth of 100 mm. (4 inches.) On slopes between 3 horizontal to 1 vertical and 1 horizontal to 1 vertical, the soil shall be tilled to a minimum depth of 50 mm (2 inches) by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1 horizontal to 1 vertical and steeper, no tillage is required.~~

3.2.4 Finished Grading

3.2.4.1 Preparation

Turf areas shall be filled as needed or have surplus soil removed to attain the finished grade. Drainage patterns shall be maintained as indicated on drawings. Turf areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of erosion or grade deficiencies shall conform to topsoil requirements specified in Section 02210 GRADING. Finished grade shall be 25 mm (1 inch) below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas.

3.2.4.2 Lawn Area Debris

Lawn areas shall have debris and stones larger than 25 mm (1 inch) in any dimension removed from the surface.

3.2.4.3 Field Area Debris

NOTE: Provide for finished grading of areas not requiring fine raking to remove debris and stones larger than 25 mm (1 inch). This procedure may be more cost effective for areas not requiring a lawn finish.

Field areas shall have debris and stones larger than 75 mm (3 inches) in any dimension removed from the surface.

3.2.4.4 Protection

Finished graded areas shall be protected from damage by vehicular or pedestrian traffic and erosion.

3.3 SEEDING

~~NOTE: Allow the Contractor seed application options when seeding large areas over one acre. Label seeding rates to be used for lawn areas and for field areas, when appropriate. Define lawn areas and field areas on the drawings.~~

3.3.1 General

Prior to seeding, any previously prepared seedbed areas compacted or damaged by interim rain, traffic or other cause, shall be reworked to restore the ground condition previously specified. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.2 Equipment Calibration

The equipment to be used and the methods of turfing shall be subject to the inspection and approval of the Contracting Officer prior to commencement of turfing operations. Immediately prior to the commencement of turfing operations, the Contractor shall conduct turfing equipment calibration tests in the presence of the Contracting Officer.

3.3.3 Applying Seed

3.3.3.1 Broadcast Seeding

Seed shall be uniformly broadcast at the ~~specified rate of [] kilograms per hectare (pounds per 1000 square feet) rate~~ using broadcast seeders. Half of seed shall be broadcast in one direction, and the remainder at right angles to the first direction. Seed shall be covered to an average depth of 5 mm (1/4 inch) by disk harrow, steel mat drag, cultipacker, or other approved device.

3.3.3.2 Drill Seeding

Seed shall be uniformly drilled to an average depth of 15 mm (1/2 inch) and at the ~~specified rate of [] kilograms per hectare (pounds per 1000 square feet)~~ using equipment having drills not more than 160 mm (6-1/2 inches) apart. Row markers shall be used with the drill seeder.

3.3.3.3 Rolling

Immediately after seeding, except for slopes 3-horizontal-to-1 vertical and greater, the entire area shall be firmed with a roller not exceeding 130 kg (90 pounds) for each meter (foot) of roller width. Areas seeded with seed drills equipped with rollers shall not be rolled.

3.3.4 Hydroseeding

Seed and fertilizer shall be added to water and thoroughly mixed at the rates specified. {Wood cellulose fiber mulch shall be added at the rates recommended by the manufacturer after the seed, fertilizer and water have been thoroughly mixed, to produce a homogeneous slurry.} Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.5 Mulch

3.3.5.1 Straw or Hay Mulch

Straw or hay mulch shall be spread uniformly at the rate of 4.5 metric tons per hectare. (2 tons per acre.) Mulch shall be spread by hand, blower-type mulch spreader or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of a steep slope and continued uniformly until the area is covered. The mulch shall not be bunched. All seeded areas shall be mulched on the same day as the seeding.

3.3.5.2 Mechanically Anchoring

Immediately following spreading, the mulch shall be anchored to the soil by a V-type-wheel land packer, a scalloped-disk land packer designed to force mulch into the soil surface, or other suitable equipment.

3.3.5.3 Asphalt Adhesive Tackifier

When asphalt adhesive is applied to the in-place mulch, spraying shall be at the rate of between 400 to 500 liters per hectare. (10 to 13 gallons per 1000 square feet.)

3.3.5.4 ~~OMITTED~~Non-Asphaltic Tackifier

~~Hydrophilic colloid shall be applied at rate recommended by manufacturer. Apply with hydraulic equipment suitable for mixing and applying uniform mixture of tackifier.~~

3.3.5.5 Spreading Asphalt Adhesive Coated Mulch

Straw or hay mulch shall be spread simultaneously with asphalt adhesive at the rate of 2 tons per acre by using power mulch equipment which shall be equipped with suitable asphalt pump and nozzle. The adhesive-coated mulch shall be applied evenly over the surface. Sunlight shall not be completely excluded from penetration to the ground surface.

3.3.5.6 Wood Cellulose Fiber

Wood cellulose fiber mulch for use with the hydraulic application of seed and fertilizer shall be applied as part of the hydroseeding operation.

3.3.6 Water

Watering shall be started within 7 days after completing the seeded area. Water shall be applied at a rate sufficient to ensure moist soil conditions to a minimum depth of 25 mm. (1 inch.) Run-off and puddling shall be prevented.

3.4 ~~OMITTED~~SODDING

3.4.1 ~~General~~

~~Areas shall be sodded as indicated. Adequate soil moisture shall be ensured prior to sodding by spraying water on the area to be sodded and wetting the soil to a minimum depth of 25 mm. (1 inch.)~~

3.4.2 ~~Placing Sod~~

~~Rows of sod shall be placed parallel to and tightly against each other. Joints shall be staggered laterally. The sod strips shall not be stretched or overlapped. All joints shall be butted tight. Voids and air drying of roots shall be prevented. On long slopes, sod shall be laid at right angles to slopes. In ditches, sod shall be laid at right angles to the flow of water. When required, the sod shall be anchored by placing anchors a minimum distance of 600 mm (2 feet) on center with a minimum of 2 anchors per sod section.~~

3.4.3 ~~Finishing~~

~~Air pockets shall be eliminated and a true and even surface shall be provided by tamping or rolling the sod in place. Displacement of the sod shall be assured by knitting of sod to the soil. Frayed edges shall be trimmed and holes or missing corners shall be patched in the sod.~~

3.4.4 ~~Watering Sod~~

~~Watering shall be started immediately after completing each day of sodding. Water shall be applied at a rate sufficient to ensure moist soil conditions to a minimum depth of 25 mm. (1 inch.) Run-off and puddling shall be prevented.~~

3.5 OMITTED SPRIGGING

NOTE: Select sprigging method to be used.

3.5.1 ~~General~~

~~Areas shall be sprigged as indicated.~~

3.5.2 ~~Broadcast Sprigging~~

~~Sprigs shall be broadcast uniformly by hand, with mechanical equipment or other approved method. Sprigs shall be planted to provide a minimum number of 30 (25) viable sprigs per square meter. (yard.) The maximum space between sprigs shall be 300 mm. (12 inches.) Sprigs shall be forced into the soil to a minimum depth of 25 mm (1 inch) by disk rolling, pressing with steel matting, or other approved method.~~

3.5.3 ~~Hydroplanting~~

~~Sprigs shall be mixed with water and uniformly applied under pressure over the entire area. Sprigs shall be covered by distributing a topdressing uniformly and evenly to a minimum depth of 25 mm. (1 inch.) Topdressing shall conform to the topsoil requirements specified in the Section 02210 GRADING.~~

3.5.4 ~~Row Sprigging~~

~~Sprigs shall be planted in rows spaced a maximum of 300 mm (12 inches) apart and to a minimum depth of 25 mm (1 inch) with mechanical sprig planter or other methods. Sprigs shall be placed a maximum of 150 mm (6 inches) apart in the rows.~~

3.5.5 ~~Overseeding~~

~~When required, seed shall be uniformly broadcast and applied at the rate of [] kilograms (pounds) per square meter. (1000 square feet.)~~

3.5.6 ~~Rolling~~

~~Immediately after completion of the sprigging operation, except on slopes 3 horizontal to 1 vertical or steeper, the entire area shall be firmed with a roller not exceeding 135 kg for each meter (90 pounds for each foot) of roller width.~~

3.5.7 ~~Finishing~~

~~The finished surface shall be flush with the finished grade. Approximately 25 percent of the planted sprigs should extend above the soil upon completion of the sprigging operation.~~

3.5.8 ~~Watering Sprigs~~

~~Watering shall be started immediately after completing each day of sprigging. Water shall be applied at a rate sufficient to ensure moist soil conditions to a minimum depth of 25 mm. (1 inch.) Run off and puddling shall be prevented.~~

3.6 EROSION CONTROL

3.6.1 Erosion Control Material

Erosion control material, where indicated or required, shall be installed in accordance with manufacturer's instructions. Placement of the erosion control material shall be accomplished without damage to installed material or without deviation to finished grade.

3.6.2 Temporary Turf Cover

3.6.2.1 General

When there are contract delays in the turfing operation or a quick cover is required to prevent erosion, the areas designated for turf shall be seeded with a temporary seed as directed by the Contracting Officer.

3.6.2.2 Application

When no other turfing materials have been applied, the quantity of one half of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION. Seed shall be uniformly broadcast and applied at the specified rate of [] kilograms (pounds) per square meter. (1000 square feet.) The area shall be watered as required.

3.7 APPLICATION OF PESTICIDE

NOTE: When a pest is known to be in the soil, identify the pest and the area to be treated.

~~When pesticide becomes necessary to remove a pest or disease, a statecertified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Hydraulic equipment shall be~~

~~provided for the liquid application of pesticides with a leak proof tank, positive agitation methods, controlled application pressure and metering gauges. A pesticide plan shall be provided to the Contracting Officer as stated in paragraph SUBMITTALS.~~

3.8 RESTORATION AND CLEAN UP

3.8.1 Restoration

Existing turf areas, pavements and facilities that have been damaged from the turving operation shall be restored to original condition at Contractor's expense.

3.8.2 Clean Up

Excess and waste material shall be removed from the planting operation and shall be disposed of off the site. Adjacent paved areas shall be cleaned.

3.9 PROTECTION OF TURFED AREAS

Immediately after turving, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed by the Contracting Officer.

3.10 TURF ESTABLISHMENT PERIOD

3.10.1 Commencement

The Turf Establishment Period for establishing a healthy stand of turf shall begin on the first day of work under this contract and shall end three (3) months after the last day of turving operations required by this contract. Written calendar time period shall be furnished to the Contracting Officer for the Turf Establishment Period. When there is more than one turf establishment period, describe the boundaries of the turfed area covered for each period.

3.10.2 Satisfactory Stand of Turf

3.10.2.1 Seeded Area

- A. Lawn Area: A satisfactory stand of turf from the seeding operation for a lawn area is defined as a minimum of 160 (15) grass plants per square meter. (foot.) Bare spots shall be no larger than 150 mm (6 inches) square. The total bare spots shall not exceed 2 percent of the total seeded area.
- B. Field Area: A satisfactory stand of turf from the seeding operation for a field area is defined as a minimum of 100 (10) grass plants per square meter. (foot.) The total bare spots shall not exceed 2 percent of the total seeded area.

3.10.2.2 ~~OMITTED~~ Sodded Area

~~A satisfactory stand of turf from the sodding operation is defined as living sod uniform in color and leaf texture. Bare spots shall be no larger than 50 mm (2 inches) square.~~

3.10.2.3 ~~OMITTED~~ Sprigged Area

A satisfactory stand of turf from the sprigging operation is defined as a minimum of 20 (two) turf plants per square meter. (foot.) Bare spots shall be no larger than 230 mm (9 inches) square. The total bare spots shall not exceed 2 percent of the total sprigged area.

3.10.3 Maintenance During Establishment Period

3.10.3.1 General

Maintenance of the turfed areas shall include eradicating weeds, eradicating insects and diseases, protecting embankments and ditches from erosion, maintaining erosion control materials and mulch, protecting turfed areas from traffic, mowing, watering, and post-fertilization.

3.10.3.2 ~~OMITTED~~ Mowing

NOTE: When the contract will be completed in a short period of time or during seasons when turf growth will be slow, the mowing requirement may be deleted.

- a. ~~Lawn Areas: Lawn areas shall be mowed to a minimum height of [] millimeters (inches) when the average height of the turf becomes [] millimeters. (inches.) Clippings shall be removed when the amount of cut turf is heavy enough to damage the turfed areas.~~
- b. ~~Field Areas: Field areas shall be mowed once during the season to a minimum height of [] millimeters. (inches.)~~

3.10.3.3 Watering

Watering shall be at intervals to obtain a moist soil condition to a minimum depth of 25 mm. (1 inch.) Frequency of watering and quantity of water shall be adjusted in accordance with the growth of the turf. Run-off, puddling and wilting shall be prevented.

3.10.3.4 Post-Fertilization

NOTE: Provide no more than 2.5 kg (0.5 pound) of actual available nitrogen per hectare (1000 square feet) to the turf. This procedure enhances the establishment rate of the turf.

Nitrogen carrier fertilizer shall be applied at the rate of 0.5 [] kilograms per hectare (pounds per 1000 square feet) after the first month and again [in 3 months] [prior to the final acceptance]. The application shall be timed prior to the advent of winter dormancy and shall avoid excessively high nitrogen levels.

3.10.3.5 ~~OMITTED~~ Pesticide

~~Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.~~

3.10.3.6 Repair

The Contractor shall re-establish as specified herein, eroded, damaged or barren areas. Mulch shall also be repaired or replaced as required.

3.10.3.7 Maintenance Report

A written record shall be furnished to the Contracting Officer of the maintenance work performed.

3.11 FINAL ACCEPTANCE

3.11.1 Preliminary Inspection

Prior to the completion of the Turf Establishment Period, a preliminary inspection shall be held by the Contracting Officer. Time for the inspection shall be established in writing. The acceptability of the turf in accordance with the Turf Establishment Period shall be determined. An unacceptable stand of turf shall be repaired as soon as turfing conditions permit.

3.11.2 Final Inspection

A final inspection shall be held by the Contracting Officer to determine that deficiencies noted in the preliminary inspection have been corrected. Time for the inspection shall be established in writing.

-- End of Section --