
Formerly Utilized Sites Remedial
Action Program (FUSRAP)

Maywood Chemical Company Superfund Site

ADMINISTRATIVE RECORD

Document Number

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**US Army Corps
of Engineers®**

Master Construction Work Plan Revision 2

**New York District
Formerly Utilized Sites Remedial Action Program
Maywood Superfund Site
WAD 04, WBS 05**

**Prepared by:
Stone & Webster, Inc.
100 West Hunter Ave.
Maywood, New Jersey 07607**

**for:
US Army Corps of Engineers - Kansas City District
Formerly Utilized Sites Remedial Action Program
Contract No. DACW41-99-D-9001**



**US Army Corps
of Engineers**

Revision 2 November 2001

MASTER CONSTRUCTION WORK PLAN

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, NEW JERSEY

SITE-SPECIFIC ENVIRONMENTAL RESTORATION
CONTRACT NO. DACW41-99-D-9001
TASK ORDER 0001
WAD 04 WBS 05

Submitted to:

Department of the Army
U.S. Army Engineer District, New York
Corps of Engineers
FUSRAP Project Office
26 Federal Plaza
New York, New York 10278

Department of the Army
U.S. Army Engineer District, Kansas City
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Submitted by:



100 West Hunter Avenue
Maywood, New Jersey 07607

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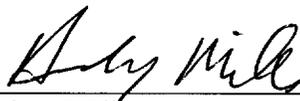
Department of the Army
U.S. Army Engineer District, Kansas City
Corps of Engineers
700 Federal Building
Kansas City, Missouri 64106

Submitted by:

 **Stone & Webster**
A Shaw Group Company

100 West Hunter Avenue
Maywood, New Jersey 07607

Reviewed/
Approved by:

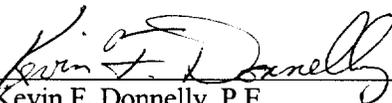


Andrew Mills
Project Manager

Date:

11/29/01

Reviewed/
Approved by:



Kevin F. Donnelly, P.E.
Project Environmental Engineer

Date:

11/29/01

Reviewed/
Approved by:

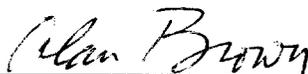


Fred Poulin
Project Superintendent

Date:

11-29-01

Reviewed/
Approved by:



Alan Brown, P.E.
Project CQCSM

Date:

11/29/01

Prepared/
Approved by:



Gregory W. Druback, P.E.
Design Manager

Date:

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**100 West Hunter Avenue
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Reviewed/
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Date: _____

REVISIONS

Revision No.	Description of Revision	Date
0	Pre-Draft – for USACE Review	July 17, 2001
1	Draft – for USACE Review	August 3, 2001
2	Response to comments from USEPA/NJDEP on the Draft	November 20, 2001

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LIST OF ABBREVIATIONS

ACP	Access control point
BMP	Best Management Practice
CDQMP	Chemical Data Quality Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
COC	Chain-of-Custody
COR	Contracting Officer's Representative
CQC	Construction Quality Control
CQCSM	Contractor Quality Control Systems Manager
CQCP	Contractor Quality Control Plan
CRP	Community Relations Plan
CS	Construction Superintendent
CWP	Construction Work Plan
DCN	Design Change Notice
DOE	U. S. Department of Energy
DOS	External and Internal Dosimetry Program
DOT	Department of Transportation
DQCR	Daily Quality Control Report
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
E&S	Erosion and Sediment Control
FCR	Field Change Request
FE	Field Engineer
FMSS	FUSRAP Maywood Superfund Site
FUSRAP	Formerly Utilized Sites Remedial Action Program
FSS	Final Status Survey
FSSP	Final Status Survey Plan
FWR	Field Work Request
GEPP	General Environmental Protection Plan
INST	Radiation Protection Instrumentation Program
LEPC	Local Emergency Planning Committee
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCW	Maywood Chemical Works

LIST OF ABBREVIATIONS

MHTDP	Materials Handling/Transportation Disposal Plan
MISS	Maywood Interim Storage Site
NCR	Nonconformance Report
NGVD	National Geodetic Vertical Datum
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NRC	United States Nuclear Regulatory Commission
OSWER	EPA Office of Solid Waste Emergency Response
PM	Project Manager
PDI	Pre-Design Investigation
PPE	Personal Protective Equipment
PP/ROD	Proposed Plan/Record of Decision
PRAR	Post Removal/Remedial Action Report
PS	Project Superintendent
QA	Quality Assurance
QC	Quality Control
QCR	Quality Control Representative
Ra-226	Radium-226
RMA	Radioactive Materials Area
RMC	Radioactive Material Control Program
ROD	Record of Decision
RPP	Respiratory Protection Program
RPS	Radiation Protection Surveillance Program
RQ	Reportable quality
RS	Regulatory Specialist
RSO	Radiation Safety Officer
SOP	Standard Operating Procedure
SSHO	Site Safety and Health Officer
SSHPP	Site Safety and Health Plan
SPCC	Spill Prevention, Control, and Countermeasure Plan
SSERC	Site Specific Environmental Restoration Contract
TDC	Transportation and Disposal Coordinator
Th-232	Thorium-232
U-238	Uranium-238
USACE	U. S. Army Corps of Engineers

LIST OF ABBREVIATIONS

WMP	Water Management Plan
WRS	Wilcoxon Rank Sum Test

1.0 INTRODUCTION

1.1 PURPOSE

This Construction Work Plan (CWP) provides overall guidance for the cleanup of radiological contaminated properties on the Formerly Utilized Sites Remedial Action Program (FUSRAP) Maywood Superfund Site (hereafter referred to as the FMSS or the “Site”). This work plan describes the construction methodology for the cleanup of all FMSS properties. Cluster-specific details such as construction sequence, schedule and site specific operations are provided in the cluster addenda volumes. The design specifications in Appendix A provide standard details to execute the cleanup activity described.

1.2 SCOPE

As currently envisioned, the remaining construction at the FMSS will take place in two main phases (Figure 1-1). Initially, construction will be limited to a removal action. The basis for the removal action is presented in the *Engineering Evaluation/Cost Analysis [EE/CA]* (USACE 2001c) for a Removal Action in support of NJDOT Roadway Improvement Projects at the FMSS. The remaining FMSS properties, shown in Figure 1-1, will be addressed as remedial actions after the Record of Decision (ROD) is signed.

Therefore, the scope of this CWP encompasses those properties (clusters 1, 4, 5 and 6) that will be affected by the New Jersey Department of Transportation (NJDOT) planned roadway improvements. These properties are:

- Cluster No. 1-72 Sidney Street;
- Cluster No. 4-160/174 Essex Street, and the I-80 Westbound Right-of-Way;
- Cluster No. 5-99 Essex Street, 113 Essex Street, and 200 NJ Route 17 North;
- Cluster No. 6-85-101, 137, 167, and 239 NJ Route 17 North

1.3 SITE DESCRIPTION AND BACKGROUND

The FMSS is located in a highly developed area of northeastern New Jersey in the Boroughs of Maywood and Lodi and the Township of Rochelle Park. The FMSS includes the Maywood Interim Storage Site (MISS), properties comprising the former Maywood Chemical Works (MCW), and other vicinity properties including numerous residential, commercial, federal, state and municipal properties. The Site is identified as the Maywood Chemical Company Site (NJD980529762) in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS). As a result of past activities at the Site, these properties are contaminated with the radiological hazardous substance thorium-232 (Th-232), radium-226 (Ra-226) and uranium-238 (U-238) and their radioactive decay series.

A detailed description of the site, the major properties, background and history of the FMSS is provided in the *Remedial Investigation Report for the Maywood Site* (DOE, 1992) and the

Remedial Design/Remedial Action Implementation Plan For the Maywood Vicinity Properties (DOE, 1995).

1.4 DOCUMENT ORGANIZATION

The CWP is comprised of two parts: this master volume and a series of cluster specific addenda. This master volume presents CWP common means and methods that will be followed during construction.

The master volume includes the overall work and coordination for the cleanup activities by providing the general project organization, a description of the construction activities, construction quality control issues, environmental protection and spill prevention discussions and a proposed close out report outline.

The addenda volumes contain cluster-specific construction directives that are unique to a particular cluster such as detailed construction sequences, equipment and material list, best management practices, and any changes from the outlined activities in the master CWP volume due to site specific conditions.

The activities describe in this CWP are presented in accordance with all approved site wide documents relevant to the work described. Each document is listed below and briefly described in Section 2.0.

- General Environmental Protection Plan (GEPP) (USACE 1999c)
- Site Safety and Health Plan (SSHP) (USACE 1999, current revision pending approval)
- Material Handling Transport and Disposal Plan (MHTD) (USACE 2000b)
- Water Management Plan (WMP) (USACE 2001d)
- Master Final Status Survey Plan (Master FSSP) with cluster-specific addendum (USACE 2001e)
- Contractor Quality Control Plan (CQCP) (USACE 1999a) [addenda such as the Construction CQ Plan for Soil Load-Out, Transportation & Disposal (USACE 2001f) are also included]
- Chemical Data Quality Management Plan (CDQMP) (USACE 2000a)
- Community Relations Plan (CRP) (USACE 2001a)

With the exception of the CQCP, the Master FSSP, and the WMP, the documents listed above were reviewed and approved by the Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP). These documents are part of the Maywood Administrative Record, which can be accessed through the Internet at <http://www.fusrapmaywood.com>.

The Master FSSP with cluster-specific addenda and the WMP will be submitted to the EPA and NJDEP for review prior to initiating construction.

2.0 SITE-WIDE WORK CONTROL DOCUMENTS

The following sections provide a brief summary of the information in each of the relevant Project Planning and Site-Wide Work Control Documents that are incorporated into this plan by reference.

These documents are updated periodically as necessary. Major revisions are reviewed and approved by the USACE, EPA, and the NJDEP as required. The most current approved revision for each document is assumed.

2.1 GENERAL ENVIRONMENTAL PROTECTION PLAN (GEPP)

The GEPP presents the overall environmental protection methodology for the FMSS including land use and demography, topography, surface water control, wetlands, floodplains, geology/soils, hydrology/groundwater, ecology-terrestrial ecosystems, ecology-aquatic ecosystems, climate and meteorology, and historic and archaeological sites. General environmental requirements for noise control, artificial lighting, well abandonment, and tree protection are also presented.

Elements of environmental protection presented in Sections 3.0 through 8.0 of the GEPP are Source Water and Wastewater, Erosion Control, Dust Control, Maintenance and Inspection, General Spill Prevention, and Recycling and Waste Minimization Plan and will be referred to and implemented throughout the course of the project.

2.2 SITE SAFETY AND HEALTH PLAN (SSHP)

The SSHP identifies radiological, chemical, physical and environmental hazards associated with work at the Site and provides guidelines and/or standard operating procedures necessary to minimize the potential for exposure to those hazards.

In Volume 1 of the SSHP a number of general (non-property specific) physical hazards are discussed including: noise; slips, trips and falls; fire; explosions and hot work; use of ladders and scaffolding; small tools, and heavy and mechanized equipment; operation of motor vehicles; material handling (lifting etc.); hazardous energies (electrical, mechanical, pressurized systems); intrusive activities including excavations; demolition; confined space entry; dust; and railroads. In addition, environmental hazards (e.g., heat and cold stress, insects, and noxious plants) and hazardous work permits are discussed.

In Volume 2 of the SSHP, an Activity Hazards Analysis (AHA) process that provides a method for identifying activity-specific safety measures in detail is provided.

Of particular importance is the discussion of site control and work zones. These are discussed in general in the SSHP, Volume 7. Contamination control and decontamination procedures are presented. Air monitoring requirements are presented along with radiological requirements. The appendices contain an extensive collection of procedures referenced from the body of the SSHP including External and Internal Dosimetry Program (DOS); Radiation Protection Instrumentation Program (INST); Access Control Program (ACP); Radiation Protection Surveillance Program

(RPS); Radioactive Materials Control Program (RMC); and the Respiratory Protection Program (RPP).

In the event of new hazards occurring, contingency planning and emergency response are also addressed in the SSHP. The AHA will be revised to address any new hazards as site and/or scope of work changes.

2.3 MATERIALS HANDLING/TRANSPORT AND DISPOSAL PLAN (MHTDP)

The MHTDP addresses the actions necessary to ensure compliance with applicable local, State, and Federal regulations for the management and disposal of waste generated from the FMSS. The elements corresponding to the excavation of contaminated material, the transport of the contaminated material to the MISS, and its ultimate disposal are addressed. The MHTDP discusses types of wastes generated, estimated volume of material to be handled, storage of material, waste characterization procedures, profiling and Bill of Lading/Manifests requirements, packing, labeling and marking waste, transport and disposal of radiological/hazardous waste, and general disposal options.

The methodology to determine the classification for shipping the excavated material under the United States Department of Transportation (DOT) regulations is provided.

2.4 WATER MANAGEMENT PLAN (WMP)

The Water Management Plan (WMP) establishes the procedures for managing storm water, groundwater, and decontamination wash water during construction. The goals in managing water are to minimize the volume of water that becomes contaminated and requires treatment and disposal; to efficiently and safely contain, collect, treat and dispose of all contaminated water from construction operations; and to minimize the impact of water on construction operations. The procedures in the WMP address containment, collection, treatment, and disposal of construction water.

2.5 CONTRACTOR QUALITY CONTROL PLAN (CQCP)

The CQCP describes the program used to ensure that construction actions are completed efficiently, safely and in accordance with all approved designs, specifications, and Site Wide Control Documents.

The Quality Control Organization is presented along with the authorities and responsibilities of the key personnel. Control of project activities is discussed along with inspections. The three-phase inspection approach is presented for the project activities (i.e. definable features of work).

The site document control system providing measures for controlling the issuance, distribution, storage, and maintenance of documents related to quality is addressed. Daily quality control report requirements are presented. The indexing and filing, storage and maintenance and turnover of Project Records is presented, as are requirements for submittals, handling of comments, and other documentation. An overview of addressing nonconformance and corrective actions is also presented.

A description of the controls and procedures to be implemented during design activities including general requirements, document changes, design analysis, design review, and special instructions to field personnel is presented.

2.6 CHEMICAL DATA QUALITY MANAGEMENT PLAN (CDQMP)

The CDQMP is a four-volume set of procedures for all sampling, testing, and laboratory work for this effort. It consists of a Quality Assurance Project Plan (QAPP) and a Field Sampling Plan (FSP). The objective of the CDQMP is to develop and implement procedures for field sampling, chain-of-custody (COC), laboratory analysis, and reporting which will provide information for site evaluation and assessment leading to cleanup. It is applicable to all tasks involving sampling on the FMSS.

The appendices include the analytical procedures used by the contract laboratories for chemical and radiological analysis for samples taken on the FMSS.

Also included in the CDQMP are a series of FMSS-specific field procedures (Appendix A of Volume 3-FSP of the CDQMP). Standard Operation Procedures (SOP) are cross-referenced when necessary.

2.7 COMMUNITY RELATIONS PLAN (CRP)

The CRP presents an overview of the relationship of the site and the work to the surrounding communities. It serves as a background document for the CWP. The CRP provides a chronology of community involvement, a discussion of the administrative record and issues of concern to the community. Appendix B of the CRP presents a list of contacts (i.e., names, addresses, and phone numbers for Federal, State, county and local officials, USACE, EPA, local organizations, and the media).

2.8 MASTER FINAL STATUS SURVEY PLAN

The Master Final Status Survey Plan (FSSP) documents the approach for implementing final status surveys (FSS) that is consistent with the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (EPA 1997). The objective of the plan is to provide a consistent approach for planning, performing, and assessing site soils through final status surveys in order to demonstrate compliance with established dose and risk-based release criteria. As each property is addressed, a property-specific addendum is developed to provide the FSS design and basis for the property.

3.0 PROJECT ORGANIZATION

The chart shown as Figure 3-1 defines the project-dedicated team organized to implement the activities discussed in this plan. Figure 3-1 illustrates primary “chain of command” and identifies key positions responsible for the execution of the overall project. The responsibilities listed below for each key personnel are directly related to the activities discussed here and therefor added to responsibilities described in all subsequent plans referenced.

Project Manager

The Project Manager (PM) is the person in charge of the overall management of the contract including cost, schedule and technical quality. The PM has full authority over coordination and direction of the project. The PM regularly communicates with the Project Superintendent and the Project Engineer regarding day-to-day activities performed on the FMSS.

The PM has ultimate responsibility for the quality of project deliverables. Specific responsibilities include but are not limited to:

- Reviews all deliverables prior to submittal to the USACE, NY and KC Districts;
- Communicates with the Stone & Webster Project Superintendent to ensure project schedule and scope compliance;
- Communicates with the Contracting Officer’s Representative (COR) on a regular basis to review project progress and contract compliance;
- Reviews program QC procedures; and
- Provides cost accounting updates to verify project is within budget.

Project Superintendent

The Project Superintendent (PS) is responsible for managing the cleanup activities in accordance with this CWP and other project plans and specifications. The PS responsibilities include, but are not limited to:

- Implements day-to-day aspects of the SSHP;
- Manages day-to-day execution of the project at the site, including administrative and procurement activities;
- Monitors work progress and schedule, and advises project manager of variances;
- Attends work progress meetings and coordinates daily site operations with all subcontractors and STONE & WEBSTER personnel;
- Assists in the preparation of work progress schedules, project reports, drawings, and required compliance submittals;
- Ensures project deliverables are responsive and on schedule;

- Reviews all project activities including, but not limited to, sampling, cleanup, decontamination, documentation, chain-of-custody procedures, site rules and compliance, and compliance with the Stone & Webster SSHP and the Work Plan; and
- Supports the implementation of the QC Program.

Contractor Quality Control Systems Manager

The Contractor Quality Control System Manager (CQCSM) is responsible for implementation of Contractor Quality Control Plan (CQCP). The CQCSM will be onsite at all times during construction. In the event of his absence, a qualified individual will be appointed to serve as a replacement. The requirements for the alternate will be the same as for the designated CQCSM.

The responsibilities of the CQCSM include but are not limited to:

- Provides and maintains an effective QC system for all construction activities;
- Monitors QC activities to ensure conformance with authorized policies, procedures, contract specifications, approved work plan and sound practices;
- Maintains sufficient staff to perform all QC activities to ensure QC for all work phases, work shifts, and work crews;
- Attends required meetings, including the pre-construction conference, site survey visit, and other scheduled meetings; and
- Prepares and/or reviews the Daily Quality Control Report (DQCR) and QC checklists.

Project Engineer

The Project Engineer (PE) is responsible for performance of the technical aspects of the cleanup and construction activities. Responsibilities include but are not limited to:

- Maintains day-to-day coordination with Field Engineers to resolve engineering issues and field change requests during construction;
- Reviews and approves submittals for compliance with design specifications;
- Ensures compliance of field, laboratory, data management, and construction activities with design requirements;
- Communicates with the PM regarding engineering activities;
- Coordinates the preparation of the Final Closeout Report; and
- Reviews and approves the as-built drawings.

Site Safety and Health Officer

The Site Safety and Health Officer (SSHO) is responsible for the implementation and enforcement of the SSHP during site activities. The SSHO has the following responsibilities:

- Approves and designates appropriate personal protective equipment (PPE) and safety procedures specified in the SSHSP for site activities; and

- Oversees the field monitoring, environmental sampling, health and safety training, and coordination of medical surveillance for all site personnel.

The SSHO has a direct communication line to the Project Certified Industrial Hygienist. The SSHO also has "stop work" authority if unsafe conditions arise.

Radiation Safety Officer

The Radiation Safety Officer (RSO) reports directly to the SSHO and is responsible for ensuring that radiation health and safety procedures designed to protect site personnel and the public are maintained throughout the project. The RSO coordinates the establishment of radiological areas, monitoring radiation exposure levels, and inspections on all material/equipment entering or leaving the FMSS for compliance with the SSHP and other applicable regulations. The roles and responsibilities of the RSO are further defined in the SSHP.

Transportation & Disposal Coordinator

The Transportation & Disposal Coordinator (TDC) is responsible for coordinating the daily activities associated with the task. The TDC is also responsible for the task budget and schedule as well as ensuring that site operations comply with the SSHP and any task-specific addenda or modifications to the SSHP.

The TDC is responsible for supervising activities associated with the transportation and disposal of waste materials including: waste characterization/classification, profiling, procurement of subcontractors, regulatory compliance EPA, DOT, United States Nuclear Regulatory Commission (NRC), packaging of waste, preparation of shipping documents and labeling/placarding of packages and transport vehicles. The TDC coordinates transportation and disposal activities with the Construction Superintendent who is responsible for all field activities.

Construction Superintendent

Construction Superintendent (CS) reports to the Project Superintendent and works with the Field Engineer (FE) and the Construction Administrator to implement and complete the scope of work described in this CWP and associated addenda. The CS supervises and directs union craft and subcontractors during all construction work activities.

Quality Control Representative(s)

The Quality Control Representatives (QCRs) will be assigned as project needs dictate. The QCRs report to the CQCSM and are responsible for implementing the CQCP and the Construction Quality Control (Section 5.0) of this Plan during the field operations. The duties of the QCR include the following:

- Implements the three phases of inspection (preparatory, initial, and follow-up) for all project activities (i.e. DFW as refer to in the CQCP);
- Ensures all required tests and inspections are executed and results are documented;

- Manages all submittals to ensure proper engineering review and verifies that submittals are in strict compliance with the technical specifications and design drawings;
- Inspects the work performed each day for compliance with this Construction Work Plan and technical specifications;
- Notifies the CQCSM of any work that is not in compliance with the Construction Work Plan and technical specifications;
- Reviews Field Work Requests (FWRs)/Field Change Requests (FCRs), Design Change Notices (DCNs), and Nonconformance Report (NCRs) for completeness; and
- Prepares the DQCR.

Field Engineer

The Field Engineer (FE) supports the Project Superintendent and Project Engineer during construction activities. The FE is responsible for day-to-day monitoring of field conditions as they affect the design and the environmental protection portion of the work. The FE is responsible for documentation of the construction activities and the preparation of the final closeout report upon completion of the cleanup activities.

Sampling Coordinator

The Sampling Coordinator (SC) is responsible for coordinating the sampling requirements during the cleanup activities in accordance with the Final Status Survey Plan and project specifications and shall track, document and report all data pertaining to the sampling program in accordance with the procedures identified in the CDQMP.

Work Crew

Various types of field personnel will also be required for the cleanup of a property or cluster. The CS will supervise the work crew. The types of personnel required include but are not limited to the following:

- Laborers
- Equipment Operators
- Radiation Technicians

4.0 DESCRIPTION OF ACTIVITIES

This section details construction tasks that will be performed during the cleanup of each cluster. These tasks are grouped into 7 areas: Pre-Mobilization, Mobilization and Site Preparation, Excavation, Material Handling and Transport, Decontamination, Final Status Survey, and Site Restoration. In addition, the equipment and materials used at each site and the construction schedule is discussed. The activities will be performed in accordance with the GEPP to ensure specific environmental protection requirements during construction activities are met.

4.1 PRE-MOBILIZATION

Once the right of entry is obtained and all notifications and community relations' requirements are in place for the cluster in accordance with the CRP, the RSO will conduct a radiation survey to establish radiological posting requirements.

A construction survey will be performed to layout limits of excavation and establish survey controls at the site along with a topography survey to document baseline conditions. A pre-construction video and photos will be taken to document initial conditions.

The Construction Superintendent will then review the subsurface geophysics details on the design drawings and contact New Jersey One Call (1-800-272-1000) to mark out and identify any subsurface utilities for clearance to begin excavation. Other infrastructure organizations or utility related agencies listed in section 1.10.16 of the GEPP will also be contacted if necessary.

If building structural surveys were performed for the property, they will be reviewed to document any changes before construction begins.

Finally, the Project Regulatory Specialist will verify that all-applicable permits, notifications, and approvals have been obtained prior to mobilization. Required permits, notifications, and approvals are listed in the cluster-specific addenda to this Master CWP.

Subsurface FSS sampling outside the limits of excavation will proceed prior to mobilization in accordance with the Master FSSP and cluster specific addenda. The remaining surface sampling in those areas and within the excavation will be performed post excavation.

4.2 MOBILIZATION AND SITE PREPARATION

After pre-mobilization requirements are complete, equipment and personnel will be mobilized to the cluster site to prepare and organized for cleanup and restoration activities. During mobilization, communication protocols will be established to insure effective communication between the site property and the main office of the FMSS located at 100 West Hunter Rd, Maywood, NJ in accordance with the SSHP.

All personnel will be trained and have all necessary certifications in accordance with the SSHP, Section 9.0. The tasks for mobilization and site preparation include, but are not limited to, the following:

- Verify utility layout by New Jersey One Call.
- Review the activity hazard analysis (AHA) with site personnel in accordance with the SSHP.
- Inspect and transport construction equipment to the site.
- Prepare laydown and parking areas to receive field trailers, heavy equipment, personal vehicles, and miscellaneous materials and supplies as specified by the design drawings.
- Install temporary facilities (see section 4.2.1)
- Locate and establish source of water usage (see section 4.2.5)
- Establish traffic controls, post construction signs and establish post-radiological areas in accordance with the SSHP (see section 4.2.2).
- Implement hazardous work permits in accordance with the SSHP and the corresponding SOPs included in the SSHP Appendices.
- Establish air, industrial hygiene, personnel and environmental monitoring operations in accordance with the SSHP.
- Provide site security as required (see section 4.2.2).
- Install erosion and sediment control measures in accordance with the design drawings and the GEPP (see section 4.2.3).
- Clear and grub in and around the surveyed excavation limits in accordance with the specifications (see section 4.2.4).
- Demolition and removal of asphalt, concrete and existing removable structures to access contamination as best as possible.
- If excavation depth at the monitoring well is greater than 2-feet deep, the monitoring well will be abandoned prior to excavation in accordance with NJ regulations. If it is needed for groundwater quality monitoring, a replacement well will be installed after completion of the removal/remedial action.
- If the monitoring well falls outside the excavation or the excavation is less than 2-feet at the monitoring well, it will be protected during construction activities. If a monitoring well becomes damaged at any time during construction it will be repaired if possible, or if not, abandoned in accordance with NJ regulations. If it is needed for groundwater quality monitoring, a replacement well will be installed after completion of the removal/remedial action.
- Seal and fill monitoring wells, as required, per New Jersey regulations (NJAC 7:9-1) and in accordance with Section 1.10.12 of the GEPP.

The subsequent paragraphs provide further discussion on several of these items.

4.2.1 TEMPORARY FACILITIES

To satisfy the requirements of this CWP, the SSHP and the WMP, temporary facilities include but are not limited to: office trailers; portable control access and dress out sheds; male and female sanitary facilities; hand wash stations; personal decontamination facilities; sufficient lighting equipment; and water storage facilities. Temporary power will also be provided to those facilities requiring power to operate.

Communications will consist of hand held radios and cell phones.

The locations of temporary facilities are shown on the design drawings for each cluster/property.

4.2.2 SITE SECURITY

Once mobilization begins, site security will be established to protect all equipment and materials from theft, vandalism, and to prevent residents from inadvertently being exposed to the contamination once intrusive construction activities begin.

In order to establish site security, Stone & Webster will mark all work zones in accordance with the Site Safety and Health Plan (SSHP) with any of the following high-visibility fence, roping, caution tape signage or temporary construction fencing shown on the design drawings.

Appropriate warning signs will be posted throughout the site to enhance pedestrian and driver safety in the work area and to help establish both controlled zones and site hazards.

Warning signs and /or flagmen will be used during mobilization of larger pieces of equipment and sufficient lighting will be provided in accordance with the SSHP.

4.2.3 EROSION AND SEDIMENT CONTROL

Site-specific erosion and sediment (E&S) controls will be installed in accordance with the design drawings prior to any earth disturbance activities. E&S controls will be maintained for the duration of the excavation and restoration activities. These control features will be removed only after vegetation is established and disturbed areas are stabilized. Surface water will be diverted away from excavations by grading, berming, silt fence, hay bales or pumping.

The limits of disturbance are shown on the design drawings. Excavation limits might increase if additional subsurface contamination is discovered during construction. Attempts will be made to limit ground disturbance to only areas required to accomplish the work. The duration of on-site construction activities is shown on the construction schedule.

Temporary control measures are shown on the design drawings. Other typical practices that will be employed are described below. Any site-specific control measures, different from the ones described here will be described in the site-specific addendum.

- Construct temporary diversion berms to directed surface water away from contaminated areas.
- Cover any excavated material with tarps at the end of each day and during rain events to reduce the volume of impacted water and prevent erosion.

- Trucks entering and leaving the project site will avoid direct tire contact with contaminated soil to prevent tracking soil off-site.
- All trucks leaving the site will be inspected for loose and/or contaminated soil on the exterior of the truck. Any soil on the outside of the truck will be cleaned and the truck surveyed prior to leaving the site.
- Covers will be placed over the beds of all trucks leaving the site.

E&S control measures will be monitored during all phases of the cleanup to prevent the pollution of surface waters. The inspection of all control devices will occur on a daily basis to ensure that all control devices and preventive systems are in operation to prevent pollution of the environment. Corrective action will be taken if the operability of a control device is in question.

Daily inspections will be performed in active excavation locations to ensure the proper performance of run-on and runoff controls.

Minimum of weekly and as-needed inspections will be made of inactive, non-vegetated, disturbed areas to ensure that the berms and sediment fences are functioning properly. Inspections will be made after each rainfall and on a daily basis during extensive periods of rainfall.

Corrective measures will be required if inspections reveal excessive siltation in storm water conveyances, sedimentation basins, or along silt fences. Also, maintenance of eroded areas may require the removal of loose soil, replacement with clean soil, and re-grading and/or re-seeding to the original condition. Silt accumulated in erosion control structures will be removed. Silt fences will be inspected and any damaged silt fence will be repaired or replaced. Gullies and rills will be filled and seeded to prevent further erosion.

4.2.4 CLEARING AND GRUBBING

Stone & Webster will properly clear and grub only vegetation that impedes or interferes with the safe and effective implementation of the design and requirements of the site work.

4.2.5 SOURCE OF WATER USAGE

Potable water and water for onsite construction use, including decontamination water, will be obtained from nearby fire hydrants. STONE & WEBSTER will coordinate with the local water authority for use of the hydrants (Passaic Valley Water Commission in Lodi and United Water of New Jersey in Maywood and Rochelle Park). Certain equipment must be installed in accordance with the requirements of the local water authority. Passaic Valley Water Commission requires the installation of a valve on the hydrant for the hose connection. United Water of New Jersey requires the installation of a water meter on the hydrant (the hydrant has a check valves for back flow prevention).

4.2.6 DUST MANAGEMENT

Control measures are also necessary to prevent airborne releases of dust during earth moving activities. Of particular concern is contaminated dust that may expose workers and the public to

airborne radioactive and toxic particulates. As excavated soils dry, the soil is more prone to wind erosion and dispersion of fine soil particles.

The primary dust control measure is the application of a water spray to exposed soils. Water will be delivered from a nearby hydrant, water wagon or truck. Water will be sprayed on temporary soil piles, excavations, and re-vegetation areas. Only potable water obtained from a public water supply will be used for dust control.

Dry soils that are to be excavated will be preconditioned with water to keep them moist to a depth of at least 6 in. Backfilled areas will be wetted with the water immediately after backfilling. Re-vegetation of landscape will be completed as soon as practical to retain moisture and to minimize wind erosion.

All soils, contaminated, uncontaminated, and clean backfill, will be covered during storage, wetted as required and covered during transport to prevent windblown conditions.

Monitoring for dust will also be performed visually. It will be the responsibility of each worker to observe his or her work area for the potential and actual generation of dust. Areas that show potential release of dust will be reported to the CS, who will ensure that the water will be sprayed on the area to eliminate the potential for dust problems. The area may also be covered to stop dispersal of dust. If necessary, the work area will be reduced or work stopped until the dust can be controlled.

4.3 EXCAVATION

Excavation will proceed according to the sequence identified in the cluster specific addenda. Safe excavation methods will be employed such as sloping, sheeting, piles and shoring as specified on the design drawings and in accordance with the SSHP. Before any work is started, equipment and material checks will be performed in accordance with the SSHP such as the Heavy Equipment Inspection Form and the Daily Vehicle Inspection Form. As excavation proceeds, daily housekeeping and maintenance according to Section 3.4 of the SSHP will be implemented. Standard dust, noise and E&S control measures will also be implemented in accordance with the GEPP and SSHP.

Excavation of contaminated material shall typically proceed in the following sequence/method:

- Excavate all contaminated soil to the depth indicated on the drawings. After reaching the design limit of contamination, excavation control surveys using sodium iodide detectors will be implemented as an initial check to determine whether all contaminated soils are removed. Field screening samples will be collected, as directed by the Field Engineer, for on-site laboratory analysis to calibrate field-screening measurements and to further confirm whether cleanup criteria have been met. If contamination is still present, additional excavation will be conducted. The Project Engineer might limit excavation in areas that are considered inaccessible due to slope stability concerns and the potential to undermine existing structures or roads. Excavation will continue until all accessible soil above the cleanup criteria is removed. Dust control measures will be employed when necessary (see section 4.2.6).
- Continue to excavate the remaining areas of contamination in accordance with the above methodology. NOTE: excavation shall proceed in a manner that will produce the least

amount of groundwater infiltration by removing soil above the groundwater table first as much as possible.

- Water encountered during construction will be pumped from the excavation and handled in accordance with WMP and the MHTDP.
- Install silt fence and/or separation/filtration geotextile at the end of each workday to delineate between clean and contaminated soils. This fence will prevent cross-contamination of clean soils.
- Excavated material will be directly loaded into dump trucks or staged in contaminated areas within the excavation limits for load out to the MISS for disposal. The excavated material that remains on-site at the end of each workday will be covered and secured prior to leaving the site.
- Once surface scan and screening sample results are acceptable, a final status survey (FSS) will be performed in accordance with the Final Status Survey Plan and the appropriate addenda.
- After evaluation and approval of the FSS data by Stone & Webster and the USACE, the site will be restored in accordance with the site restoration drawing.
- Perform as-built survey of the entire property.

4.4 MATERIAL HANDLING AND TRANSPORT

Two waste streams will be generated during construction: radiological contaminated material and impacted water.

4.4.1 CONTAMINATED MATERIAL

Contaminated material will consist of soil, vegetation and debris. The handling and disposal of contaminated material involves loading from the site properties into trucks, transporting to the MISS, off-loading into a staging area on the MISS, and then loading railcars from the staging area for shipment to an off-site disposal facility.

4.4.1.1 Loading at the Property

- Before loading at the site properties, trucks will be inspected and surveyed for damage and residual contamination. Daily Vehicle Inspection and Heavy Equipment Inspections Forms from the SSHP will be filled out prior to loading. Trucks will be lined with polypropylene bags to hold and cover the contaminated soil to prevent soil from leaking and also prevent water from entering the soil. (USACE 1999c)
- Soil will be loaded into trucks in designated areas only with adequate spill control measures, including equipment to catch and contain spillage, and equipment necessary to recover spillage and clean the area. Dust control measures will be implemented as necessary during loading (see section 4.2.6). Disposable sheeting will be placed on the ground around trucks to catch any incidental spillage during loading (USACE 1999c).

- Materials will be loaded into the transport vehicle in a uniform manner and distributed over the full length of the vehicle.
- Once loading is complete, trucks will be inspected for loose or escaping soil or leaching water before leaving the site. The weight and volume of each truckload will be estimated for documentation.
- The load will then be covered with a tarp or other suitable covering if required by folding the truck lining over the top of the material and secured once the vehicle is fully loaded. Dump trucks with tailgates traveling over public roadways will be tightly sealed and will be lined and covered to completely contain soil. Finally, tarps will also be tight fighting. (USACE 1999c).

4.4.1.2 Transport to the MISS

- The exteriors of all vehicles will be surveyed for radioactive contamination in accordance with SOP 103, Routine Contamination Control Surveys. Any vehicles exceeding applicable contamination criteria will be decontaminated before going onto public roads as not to spread contamination offsite.
- A secure route to the MISS is established for each cluster property. Figure 4-1 shows the primary and secondary haul routs from the properties/clusters to the MISS. Specific details of the haul routes are outlined in each cluster specific addendum.
- Federal (49CFR100-185) and NJDOT regulations (NJAC 16:49) will be followed during transport activities. The soil will be DOT classified in accordance with Section 5.0 of the Materials Handling Transportation and Disposal Plan (MHTDP) (USACE 2000b) based on direct sample results or on Preliminary Design Investigation (PDI) data and excavation control data.
- The MHTDP will be followed to meet all appropriate placards, bill of lading and letter of approval requirements to transport contaminated soil from the vicinity properties to the MISS.

4.4.1.3 Off-Loading on the MISS

- Soil will be off-loaded into staging areas on the MISS for off-site disposal.
- Once the material has been off-loaded, the trucks will be inspected to ensure that no loose soil or debris is present on the truck exterior.
- Since these trucks will be used solely for the transport of excavated materials, the interior bed of the trucks will only be decontaminated after the last load of excavated material, prior to being used for any other activity, or prior to demobilization from the site.
- Staged soil on the MISS will be loaded into rail cars for transport to a disposal facility. All activities involved in the disposal of contaminated soil from the staging area on the MISS to an off-site disposal facility are addressed in the Soil Loadout Work Plan (USACE 2001b).

4.4.2 IMPACTED WATER

Impacted water will consist of contaminated groundwater and storm water encountered during construction activities. The impacted water will be collected and pumped directly into tanker trucks or into onsite temporary holding tank as required. It will then be transported to the MISS for temporary storage followed by treatment and discharge to the local publicly owned treatment works (POTW). Any activities involving the handling, transportation, and disposal of impacted water will be conducted in accordance the WMP, which refers to procedures in the MHTDP and the SSHP.

4.4.3 MATERIAL CLASSIFICATION

The waste materials will be classified according to DOT Regulations prior to being transported back to the MISS over public roads. The classification of the material will be determined using all available information including:

- Site History
- Knowledge of the process generating the waste
- Information and analytical results from previous contractors
- Stone & Webster Pre-Design Investigation information and analytical results

The TDC will use the available information to determine the DOT classification of the material in accordance with Section 5 of the MHTDP.

Since there is limited information available for classification of the impacted water, the water will be classified with the same DOT classification as the soil because it is not expected to be more stringent than that of the soil.

Stone & Webster will use a bill-of-lading as shipping paper to accompany each load of material transported from the Cluster property to the MISS. The bills-of-lading will be prepared by the TDC in accordance with Sections 5, 6, 7 and 8 of the MHTDP. A copy of the shipping papers and any additional required attachments will accompany each load of material.

4.5 DECONTAMINATION

Upon completion of the excavation, decontamination of small tools and equipment shall be performed at the site under the direction of the SSHO. Heavy equipment will initially be decontaminated at the property by removing all loose soil from bucket, tracks and undercarriage prior to leaving the cluster property. All decontamination water and loose soil will be contained to avoid cross contamination of clean areas during decontamination procedures. When gross cleaning is complete, equipment will be transported to the MISS for a final decontamination and exit survey. At the conclusion of excavation, any sheeting, piling and shoring used to support the excavation will be removed and decontaminated prior to use at another excavation, if appropriate.

4.6 FINAL STATUS SURVEY

Final status surveys are based on the methodology described in the Master FSSP. A Final Status Survey (FSS) will be conducted at each property to verify that the cleanup objectives are met prior to site restoration. The actual FSS design for each property is presented in addendum to the Master FSS Plan. Portions of the FSS might be implemented prior to construction excavation as shown on the construction schedule and described in the cluster-specific addendum to the Master FSSP.

4.7 SITE RESTORATION

Backfill and restoration will take place at each property following the successful completion of the Final Status Survey. The fill material will be sampled and analyzed in accordance with the specification to verify it is clean and has the appropriate physical properties for the intended use. All subsurface and above ground utilities will be restored to pre-construction conditions, unless otherwise specified. The backfill will be compacted and graded to allow immediate site use. Landscaping and site restoration will be performed to return the property to prior conditions, and will include, but will not be limited to: seeding/planting, paving sidewalks, parking lots, driveways, and installing curbs, gutters, and fences. Unless otherwise identified on design drawings, there will be no changes to site elevations or drainage features. Restoration will be “replace-in-kind” unless noted on the design drawings.

4.8 EQUIPMENT/MATERIALS

Equipment used to implement the activities described in this plan will be cluster specific and included in the cluster specific addenda.

4.9 SCHEDULE

The construction schedule for each cluster is provided in the cluster specific addenda.

5.0 CONSTRUCTION QUALITY CONTROL

The construction quality control program outlined in the CQCP will be implemented for all activities described in this plan and its addenda. The QC Program includes features of work presented in an inspection schedule that will be provided as a separate submittal. The inspection and testing processes will monitor the overall quality of work, and project controls will be instituted to assure correction of deficiencies identified during the inspections and testing. Project scheduling will be instituted to assure proper sequence and performance of work activities.

The Contracting Officer's Representative (COR) or designee will be notified in writing prior to proposed changes to the QC Program, and the proposed changes will be subject to the COR's approval prior to implementation.

The checklists in Appendix B are intended to be used as guides by the field engineer and the construction superintendent to help in meeting all QC requirements during the preparatory and initial phase inspection periods.

6.0 SPILL PREVENTION

The general procedures and responsibilities for spill prevention, response activities, and cleanup associated with the construction activities at the Maywood Site are discussed in the Spill Prevention, Control and Countermeasures Plan (SPCC) within the GEPP (USACE 1999c). This section identifies the potential sources of spills during construction at individual properties. Methods that will be implemented to prevent spills, limit impact to the environment in the event of a spill, and protect personnel and the public from exposure or injury is also presented. Other than spill documentation and initial notification protocols, spill response procedures are not repeated here.

If general construction operations change and new spill sources are identified, this section will be updated. Spill sources that are unique to a property or cluster will be identified in the cluster-specific addenda.

6.1 SPILL SOURCES

Given the relatively short duration of construction activity at each property, on-site storage of petroleum products or hazardous materials is minimal. Fuel oil will not be stored on-site. A service contract will be used to fuel construction equipment on a periodic basis. Similarly, a maintenance agreement with the equipment rental agent for any required equipment maintenance will be in place. No waste oil or hydraulic fluid will be stored on-site.

During routine equipment operation, additional engine oil or hydraulic fluid will be brought to the site on an as needed basis from supplies at the MISS. Volumes will typically be less than 5-gallons at any time. Oil and hydraulic fluid will only be transported in DOT-approved containers.

Other products on-site include gasoline and lubricants. Gasoline will be used on-site to run a small power generator in the event excavation de-watering is required. The tank capacity of the generator is approximately 3 gallons. In addition, a DOT-approved 5-gallon gasoline storage container will be kept on-site for fueling the generators. Tubes of equipment lubricant will also be kept on-site.

The use of solvents or hazardous materials is not planned. Any decontamination activities on-site will use water and commercially available, biodegradable cleaners (i.e., Simple Green®).

The only other spill source identified is water that must be pumped from the excavation. This water has the potential to contain radionuclides in the form of suspended and dissolved solids. In line filters will be used to reduce suspended solids load. The water will be pumped into 2,000 – 3,000 gallon tanker trucks. Depending on the volume of water, an intermediate storage tank might be required on-site. The capacity of this tank would be 2,000 – 3,000 gallons.

6.2 SPILL PREVENTION MEASURES

Table 6-1 presents a list of potential spill contaminants, their sources, and avoidance measures that will be implemented. These spill scenarios and the required prevention measures will be discussed with personnel working on site as part of the mobilization preparatory inspection.

Contaminated will be transported via truck to the MISS. Loading of truck will only take place in designated areas. Disposable sheeting will be placed on the ground around trucks to catch any incidental spillage. Trucks will be inspected for loose or escaping soil or leaching water before leaving the site. Tarps and tailgates on the trucks will be tight fitting.

At the end of each workday, any excavated soils remaining on-site will be covered with fabric to prevent fugitive dust emissions and prevent erosion in the event of rain.

Solids, such as radioactive soil, will be controlled through dust suppression methods and BMPs for handling. Dump trucks with tailgates traveling over public roads will have tightly sealed tailgates and will be covered with tarps to completely contain soil. Soil stockpiles will be covered with tarps or polyethylene sheeting and have berms and silt fencing to divert run-on/runoff. Tarps or polyethylene sheeting covering stockpiles (clean and dirty) will be secured using sandbags or cinder blocks. Seams will be overlapped and secured in the same manner.

All fueling and lubrication of equipment at the site will be conducted so as to protect against the release of petroleum products to the environment. No unattended fueling will be performed, and all waste oil and lubricants will be and removed from the site for off-site disposal by the equipment vendor. Any petroleum, oils, and lubricants spilled will be packaged to meet DOT specifications before transporting the waste for offsite disposal.

Gasoline and diesel fuels for heavy equipment at the site will be supplied via mobile service truck. As per 49 CFR 392.50, Subpart F, the following precautions will be followed during fueling operations at Maywood. Personnel will not:

- Fuel a motor vehicle with the engine running;
- Smoke or permit any open flame within 50 ft of the fueling operation;
- Fuel a motor vehicle unless the nozzle of the fuel hose is continuously in contact with the intake pipe of the fuel tank; and
- Permit, insofar as practicable, any person to engage in such activities that would be likely to result in fire or explosion.
- Fueling facilities will be grounded in accordance with 29CFR1910.106 and 29CFR1926.152 to prevent static buildup.

6.3 RESPONSIBILITY AND AUTHORITIES

All site personnel share in the responsibility for spill prevention and reporting. Any person involved in a spill or witnessing a spill or release will cease operations that could worsen the spill and immediately notify the Construction Superintendent. All spills are to be reported to the PS and/or the SSHO, who will in turn notify the COR. The SSHO (as the spill coordinator) will be the primary responsible individual for spill response and determination of the level of notification required. The SSHO, or his designee, will coordinate larger spills that trigger a reportable quantity (RQ) level notification, as outlined in the SPCC Plan.

The location, nature, and quantity of the release determine emergency procedures. Small, non-reportable spills (i.e., non-RQ) are handled on a case-by-case basis by the PS or the SSHO.

6.4 SPILL DOCUMENTATION

The spill event will be documented by the Construction Superintendent on the Spill Incident Log (Table 6-2) and maintained by the RS. The Spill Incident Log will be part of the daily operations log, and a copy will be kept by the SSHO.

6.5 NOTIFICATION OF RQ SPILLS

Spills involving a quantity equal to or greater than the listed RQ for a hazardous substance or an extremely hazardous substance, as specified in 40 CFR 302.4 and the SARA require the proper notification to the appropriate regulatory agency. Notification protocols are described in the SPCC Plan.

6.6 SPILL MITIGATION PROCEDURES

Spill mitigation procedures are described in the approved SPCC Plan contained in Section 7.0 of the GEPP.

Table 6-1 Potential Spills, Sources, and Planned Avoidance Measures			
Contaminant	Source	Impact Scenario	Avoidance Measures
Radioactive soil particles in groundwater	Tank ruptures (worst case scenario)	Water is released to the sewer system	Provide secondary containment for tanks; use plastic sheeting to make a temporary berm.
Radioactive soil particles in groundwater	Tank valve or hose fails by freezing (worst case scenario)	Water is released to the sewer system	Provide secondary containment for tanks; use plastic sheeting to make a temporary berm. Stone & Webster will consider freezing risks and engineering controls and scheduling to avoid equipment failure.
Radioactive soil particles in groundwater	Tank truck leaks, valve or hose mechanically fails	Less than 3,000 gallons of contaminated water leaks to the ground and sewers	Inspect valves, hoses, couplings, and plugs daily. Ensure that loaded truck is emptied each night- this would minimize the extent of unattended spill.
Radioactive soil particles in groundwater	Tank truck leaks, valve or hose freezes	Less than 3,000 gallons of contaminated water leaks to the ground and sewers	Inspect valves, hoses, couplings, and plugs daily. Ensure that loaded truck is emptied each night- this would minimize spill extent. Stone & Webster will consider freezing risks and engineering/temperature controls and scheduling to avoid equipment failure.
Radioactive soil particles in groundwater	Truck leaks drained water from saturated soil on the ground.	<30 gallons	Stone & Webster will allow saturated soils to drain prior to transport, when feasible. Stone & Webster will select trucks with tightly sealed tailgates or without tailgates.

Table 6-1 Potential Spills, Sources, and Planned Avoidance Measures			
Contaminant	Source	Impact Scenario	Avoidance Measures
Fuel spill	Fuel spill, related to heavy equipment or trucks	Anticipated: 50 gallons	Stone & Webster will contract for offsite, on-demand fuel supply using mobile source. No onsite fuel storage is planned. Stone & Webster will carry fuel tank plugging kit.
Antifreeze spill	Single vehicle radiator or hose failure	Maximum 7 gallons of diluted antifreeze	Stone & Webster will inspect equipment daily for cracks and leaks and fluid levels. Onsite storage of antifreeze will be limited. Machines will be stopped in place when a leak is identified.
Used motor oil	Oil spill	Maximum of 6.5 gallon spill during equipment maintenance	Secondary containment will be provided during any schedule maintenance activities. Limited spill equipment will be available during maintenance activities.
Hydraulic Oil	Hose rupture or overfill	< 10 gallons	Stone & Webster will inspect equipment daily for cracks and leaks and fluid levels. Machines will be stopped in place when a leak is identified
Hydraulic Oil	Minor leaks and drips Minor leaks are expected	< 0.5 gallons	Operators will locate drip pans under machines that are parked when minor dripping is noted. Minor leaks will be reported to service staff for inspection and preventive maintenance.

Table 6-1 Potential Spills, Sources, and Planned Avoidance Measures			
Contaminant	Source	Impact Scenario	Avoidance Measures
Radioactive Soil Spill	Truck spill while loading Expected case for repetitive minor spills	< 5 cubic yards	This is expected as a normal part of the work process. Stone & Webster does not plan to count these spills as reportable spills. Stone & Webster will clean up these undocumented spills immediately as part of the work process. Stone & Webster will consider the cleanup of the spills as prudent housekeeping under the work plan.
Contaminated Soil Spill	Truck overturned while cornering	10 cubic yards	Stone & Webster will impose speed limits for straight-aways and corners. These spills will be reportable onsite and to the USACE. This case would be reportable to offsite regulators and authorities only if there was a release to the sewers or to offsite air. Stone & Webster safety meetings and orientation will emphasize defensive driving. Hazardous driving will be cause for discipline. Rolling a truck because of negligent driving will mandate removal of the driver from the site. Tri-axial trucks will have the third axle down prior to departing the loading site.
Contaminated Soil Spill	Soil spill on roadway	< 5 cubic yards	Spills on the roadway will be documented and decontaminated.
Dust Release	6-inch shallow-soil scraping	The driest soil is disturbed by scraping a single shallow lift	Dry surface soils will be preconditioned until moist to 6 inches below surface level before removal.

Table 6-2
FUSRAP Maywood Superfund Site Spill Incident Log Sheet

I. Initial Information Required
Name of Informant: _____
Phone Number: _____
Location of Spill: _____
Name of Injured and Type of Injuries (if applicable): _____
Substance Spilled: _____
Amount Spilled (estimated): _____
Extent of Spill: _____
Rate Material Currently Spilling (if applicable): _____
Time Spill Occurred (estimated): _____
Time of Notifications(s): _____
Other Information:
II. Spill Notification Sequence:
1. Hackensack University Medical Center (if workers injured) Time _____ (201) 996-2000
2. Fire Department and Police Department Time _____ 911 or (201) 845-8800 (Maywood) (973) 473-7600 (Lodi) (201) 843-1515 (Rochelle Park)
3. Regulatory Specialist Time _____
4. USACE COR, (201) 226-6602 Time _____
5. National Response Center (NRC) (if RQ is exceeded) Time _____ (800) 424-8802
6. NJDEP Response Center (if RQ is exceeded) Time _____ 1-877-WARNDEP (1-877-927-6337)
7. Emergency Coordinator – Local Emergency Planning Committee (LEPC) Time _____ Bergen County (201) 599-6108

Table 6-2
Emergency Response Assistance Services
(Local Emergency Services on call 24 hours/day)

Local Emergency Agency	Phone Number
Ambulance:	911
Fire Department and Police Department:	911 or (201) 845-8800 (Maywood) (973) 473-7600 (Lodi) (201) 843-1515 (Rochelle Park)
Hospital:	
	Hackensack University Medical Center (201) 996-2000 30 Prospect Avenue Hackensack, NJ 07601
Radiation Safety Officer – Eric Wise	(201) 996-2548
New Jersey Poison Control Center	1-800-764-7661
Bergen County Health Services Department	(201) 599-6108
Utilities:	
	Electric & Gas: PSE&G 1-800-436-7734
	Water: United Water (Maywood & Rochelle Park) 1-800-422-5987 Passaic Valley Water Commission (Lodi) (973) 340-4300

7.0 FINAL CLOSEOUT REPORT

The final closeout report will include a copy of this work plan, records of material transport and disposal, soil test records, and a separate Post-Removal Action Report.

A Post-Removal Action Report (PRAR) will be prepared following completion of the cleanup effort and the FSS.

The following is the proposed report outline for the PRAR derived from OSWER Directive 9320. -92-P, "Close out Procedures for National Priorities List Sites," EPA 540-R-98-016:

- Introduction

 - History

- Removal Action Guidelines

- Chronology of Events

- Descriptions of Construction Activities (with Field Changes)

- Certification Remedy Is Operational And Functional

- Operation and Maintenance

- Final Status Survey

- Final Inspection/Conclusion

 - Community Relations

 - Summary of Costs

 - References

 - Figures (Construction Survey Drawings and FSS sample locations)

 - Tables of Results

- Appendix

 - Quality Control Data

 - Submittal Register Data

8.0 REFERENCES

- DOE 1992 *Remedial Investigation Report for the Maywood Site*, prepared for the U. S. Department of Energy by Bechtel National, Inc. December 1992.
- DOE 1995 *Remedial Design/Remedial Action Implementation Plan for the Maywood Vicinity Properties*, prepared for the U. S. Department of Energy by Bechtel National, Inc. August 1995.
- EPA 1997 *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)*; EPA-402-R-97-016; NUREG-1575, December 1997.
- USACE 1999a *Final Contractor Quality Control Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. October, 1999.
- USACE 1999b *Final Site Safety and Health Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. August, 1999.
- USACE 1999c *Final General Environmental Protection Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. November, 1999.
- USACE 2000a *Chemical Data Quality Management Plan, Revision 1, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. February, 2000.
- USACE 2000b *Materials Handling/Transportation and Disposal Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. January 2000.
- USACE 2001a *Community Relations Plan* prepared for USACE by Stone & Webster, Inc. March 2001.
- USACE 2001b *Construction Soil Load-out, Transportation and Disposal, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. April 2001.
- USACE 2001c *Engineering Evaluation/Cost Analysis for the Removal Action in support of NJDOT Roadway Improvement Projects at the FUSRAP Maywood Chemical Company Site, Maywood, New Jersey*, prepared for USACE by Stone & Webster, Inc. May 2001.
- USACE 2001d *Water Management Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. November 2001.
- USACE 2001e *Master Final Status Survey Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. June, 2001.
- USACE 2001f *Contractor Quality Control Plan for Soil Load-out, Transportation and Disposal-CQC Plan, FUSRAP Maywood Superfund Site*, prepared for USACE by Stone & Webster, Inc. March 2001.

FIGURES



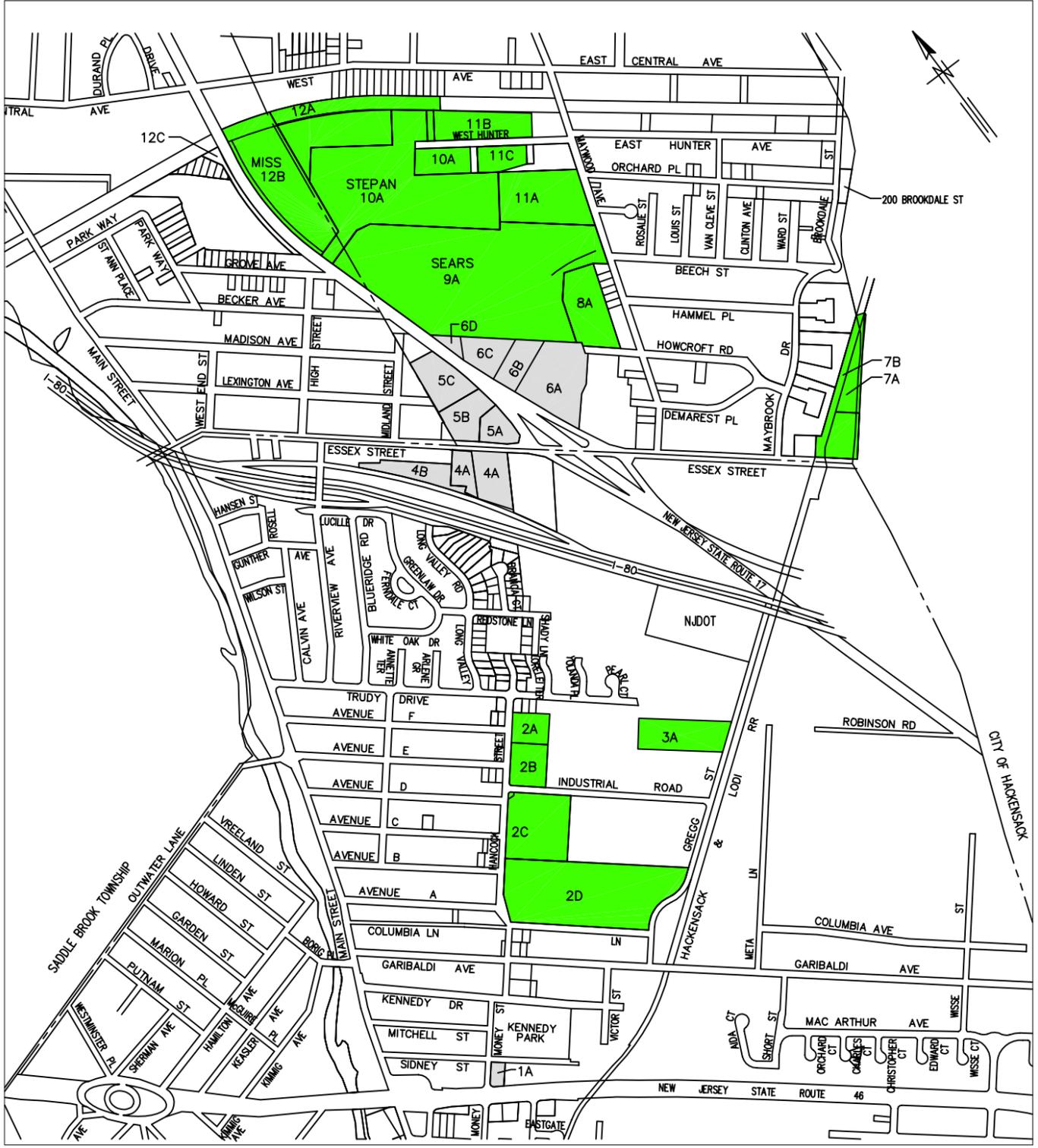
U.S. Army Corps of Engineers
NEW YORK DISTRICT

MAYWOOD PROPERTIES:

Cluster No.	Property No.	Property Address
1	01A	72 Sydney Street
2	02A	100 Hancock Street
	02B	80 Hancock Street
	02C	80 Industrial Road
	02D	8 Mill Street
3	03A	170 Gregg Street
4	04A	160/174 Essex Street
	04B	1-80 Westbound Right-of-Way
5	05A	99 Essex Street
	05B	113 Essex Street
	05C	200 NJ Route 17 South
6	06A	85-101 NJ Route 17 North
	06B	137 NJ Route 17 North
	06C	167 NJ Route 17 North
	06D	239 NJ Route 17 North
7	07A	111 Essex Street
	07B	New York, Susquehanna & Western Railway - Lodi Branch
8	08A	23 West Howcroft Road
9	09A	149-151 Maywood Avenue
10	10A	100 West Hunter Avenue
11	11A	205 Maywood Avenue
	11B	61 West Hunter Avenue
	11C	50 West Hunter Avenue
12	12A	New York, Susquehanna & Western Railway
	12B	100 West Hunter Avenue
	12C	NJ Route 17 Right-Of-Way

MAJOR PHASES OF WORK:

- EE/CA
- ROD



Symbol	Description	Date	Approved

	Designed by: E. DUDEK	Date: 6/12/01
	Drawn by: C. SIMOND	Date: 6/12/01
Reviewed by: G. DRUBACK	Approved by: K. DONNELLY	Date: 6/27/01
File Name: C-ALL-RAWP	Date: 	Date:

U.S. ARMY ENGINEER DIVISION
 CORPS OF ENGINEERS
 NEW YORK DISTRICT
 US ARMY CORPS OF ENGINEERS
 FORMERLY UTILIZED SITES
 REMEDIAL ACTION PROGRAM

FUSRAP MAYWOOD SUPERFUND SITE
 MAYWOOD, LODI, AND
 ROCHELLE PARK, NEW JERSEY
 CWP
 LOCATION OF MAYWOOD
 BERGEN COUNTY, NEW JERSEY
 MASTER SEQUENCE OF WORK

Contract Number:
DACW41-99-D-9001
 Delivery Order Number:
WAD 04
 Project Number:
08575
 Drawing Number:
FIGURE 4-1

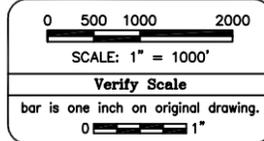
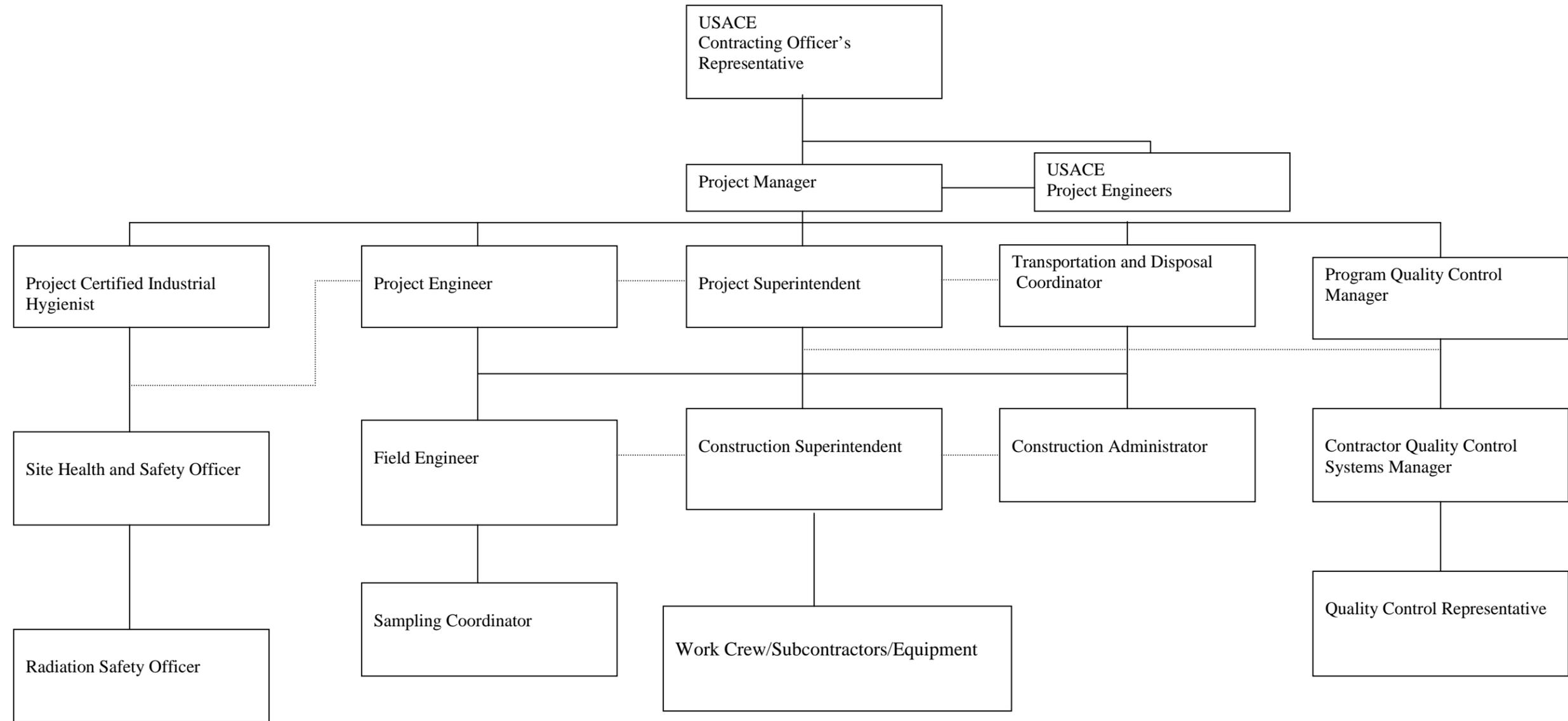


FIGURE 3-1 - Project Organization chart





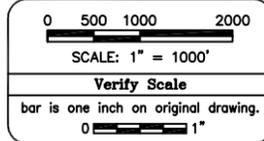
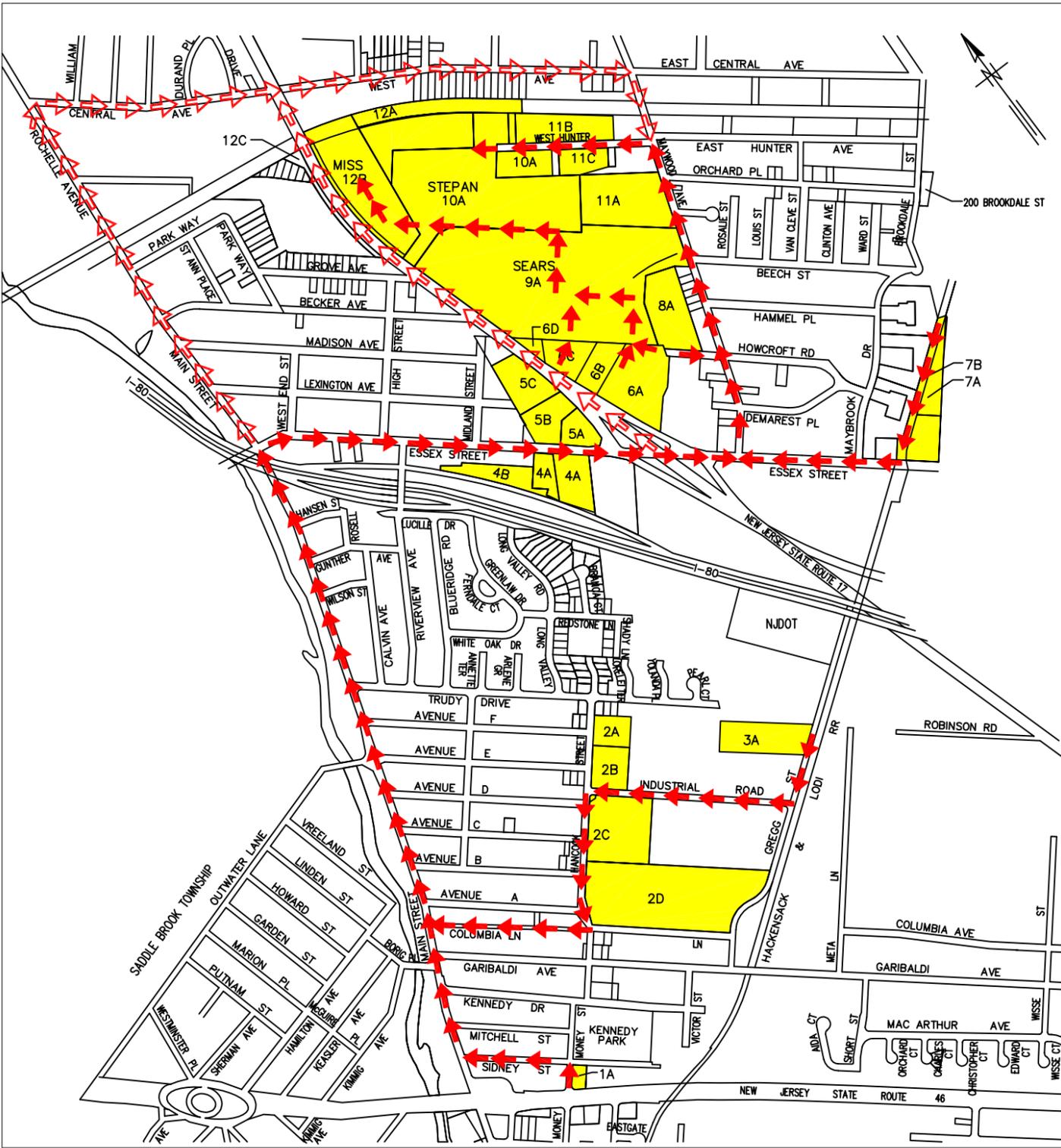
U.S. Army Corps of Engineers
NEW YORK DISTRICT

MAYWOOD PROPERTIES:

Cluster No.	Property No.	Property Address
1	01A	72 Sydney Street
2	02A	100 Hancock Street
	02B	80 Hancock Street
	02C	80 Industrial Road
3	02D	8 Mill Street
	03A	170 Gregg Street
	04A	160/174 Essex Street
4	04B	I-80 Westbound Right-of-Way
	05A	99 Essex Street
	05B	113 Essex Street
5	05C	200 NJ Route 17 South
	06A	85-101 NJ Route 17 North
	06B	137 NJ Route 17 North
6	06C	167 NJ Route 17 North
	06D	239 NJ Route 17 North
	07A	111 Essex Street
7	07B	New York, Susquehanna & Western Railway - Lodi Branch
	08A	23 West Howcroft Road
	09A	149-151 Maywood Avenue
8	10A	100 West Hunter Avenue
	11A	205 Maywood Avenue
	11B	61 West Hunter Avenue
9	11C	50 West Hunter Avenue
	12A	New York, Susquehanna & Western Railway
	12B	100 West Hunter Avenue
10	12C	NJ Route 17 Right-Of-Way
11		
12		

LEGEND

- PRIMARY HAUL ROUTE TO MISS SITE
- SECONDARY HAUL ROUTE TO MISS SITE



Symbol	Description	Date	Approved

	Designed by: E. DUDEK	Date: 6/12/01	Approved by: K. DONNELLY	Date: 6/27/01
	Drawn by: C. SIMOND	Date: 6/12/01	File Name: C-ALL-MHR	Revisions: Date Description Date Approved

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
NEW YORK DISTRICT

FUSRAP
U.S. ARMY CORPS OF ENGINEERS
FORMERLY UTILIZED SITES
REMEDIAL ACTION PROGRAM

FUSRAP MAYWOOD SUPERFUND SITE
MAYWOOD, LODI, AND
ROCHELLE PARK, NEW JERSEY
CWP

LOCATION OF MAYWOOD
BERGEN COUNTY, NEW JERSEY
MASTER HAUL ROUTE

Contract Number:
DACW41-99-D-9901

Delivery Order Number:
WAD 04

Project Number:
08575

Drawing Number:
FIGURE 3-1

APPENDICES

APPENDIX A

PROJECT TABLE OF CONTENTS

DIVISION 02 - SITE WORK

02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL
02230 CLEARING AND GRUBBING
02300 EARTHWORK
02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS
02635 PAVEMENT RESTORATION
02770 CONCRETE SIDEWALKS, CURBS AND GUTTERS
02921 SEEDING
02922 SODDING

-- End of Project Table of Contents --

surveyed. Survey drawings shall be included with the Closeout Report

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP:

SD-06 Test Reports

Final Status Survey Sampling and Analysis; Preliminary; G.
Closeout Report; G.

1.4 DESCRIPTION OF WORK

The work shall consist of excavation and temporary storage of contaminated material. Approximate locations of contaminated material and the extent and the depths to which they are to be removed are shown on the drawings. Known subsurface conditions, including available radiological and chemical analyses, are presented in the Pre-design Investigation (PDI) Report and the Design Analysis Report. Groundwater depth varies from location to location and is expected to be encountered occasionally during excavation activities. Approximate depth to groundwater is shown on the drawings and the Design Analysis Report for the property.

1.5 RADIOLOGICAL AND CHEMICAL TESTING

Required sampling for radiological and chemical analysis shall be conducted in accordance with the CDQMP.

1.6 SAFETY

All Excavation procedures shall be performed in accordance with the Construction Work Plan and the SSHP unless otherwise modified in these specifications. Prior to beginning excavation, a field safety checklist shall be completed and the required signatures shall be obtained.

1.7 SUBSURFACE DATA

Subsurface investigation reports and soil boring logs are available for review at the FMSS. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

PART 2 PRODUCTS

2.1 BACKFILL MATERIAL

Backfill material is addressed in Section 02300 Earthwork.

2.2 SPILL RESPONSE MATERIALS

The Contractor shall implement the approved Spill Prevention, Control and Countermeasures Plan as described in the GEPP and the Construction Work Plan and its addenda.

PART 3 EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

No excavation shall be performed until site utilities have been field located. Necessary precautions to ensure no damage occurs to existing structures and utilities shall be taken. Utilities encountered that were not previously shown or otherwise located shall not be disturbed without approval from the utility owner or Project Engineer.

Prior to the start of any excavation, the Contractor shall contact "New Jersey One Call before You Dig System" (1-800-272-1000) for utility locations and identifications. All efforts to identify, locate, and mark utilities shall be documented.

3.2 CLEARING AND GRUBBING

Clearing and grubbing shall be performed to the limits shown on the drawings in accordance with Section 02230 Clearing and Grubbing.

3.3 CONTAMINATED MATERIAL REMOVAL

3.3.1 Excavation

Areas of contamination shall be excavated to the depth and extent shown on the drawings or as directed by the Project Engineer or his/her designee. Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. An excavation of sufficient size to allow workers ample room to complete the work shall be maintained. A log of the materials and any visible signs of contamination encountered during excavation shall be maintained for each area of excavation. Excavation logs shall be maintained by the Project Engineer or his/her designee.

Removal of contaminated material beyond the initial excavation limits defined on the drawings, shall be done in accordance with field screening procedures and in lifts. The excavation lift thickness will be selected in the field. Before proceeding with excavation of each lift beyond the initial excavation limits, screening results shall be submitted for review by the Project Engineer to confirm the requirement for additional excavation.

3.3.2 Shoring

Sheeting, bracing, or shoring shall be installed where shown on the drawings and in the absence of adequate side slopes if there is a need for workers to enter the excavated area.

For excavation depths of 4 feet or less, excavation slopes may be vertical. Excavations greater than 4 feet in depth shall be provided with engineering controls (i.e., shoring, bracing, sloping) in accordance with the SSHP and/or OSHA regulations. Excavations shall be inspected daily by a competent person, as defined by 29 CFR 1926.650. Design of all shoring and bracing, sheet piling, and slopes for special conditions described below shall be performed by or under the direction of a Professional Engineer registered in the State of New Jersey. Excavation slopes shall be maintained as follows:

A. When construction equipment is not required at the top of the slope to

perform the work, the equipment shall be maintained at a minimum distance of 10 feet from the top of the slope for slopes of 1.5H:1V or steeper and more than 4 ft in depth. For slopes flatter than 1.5H:1V, a minimum distance of 2 feet shall be maintained.

3.3.3 Dewatering

Excavation shall be kept free of standing water as required. Surface water shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to assure adequate access, a safe excavation, and to ensure that compaction requirements can be met. Dewatering is also required to provide conditions free of standing water for radiological surface scans during excavation and final status surveying.

Groundwater flowing into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift, and heave in the excavation and to eliminate interference with the work.

Groundwater and stormwater removed during excavation dewatering from contaminated soil shall be analyzed, treated (if necessary) and disposed of in accordance with the Water Management Plan (WMP).

3.4 FINAL STATUS SURVEY SAMPLING AND ANALYSIS

The Project Engineer or his/her designee shall be present to inspect the removal of contaminated material from each site. After all material suspected of being contaminated has been removed, the excavation shall be examined for evidence of contamination using field screening and on-site radiological laboratory soil analysis. Excavation of additional material shall be as directed by the Project Engineer or his/her designee. After all suspected contaminated material is removed a Final Status Survey (FSS) shall be conducted in accordance with the Master FSSP and associated addenda.

3.5 CONTAMINATED MATERIAL STORAGE

Contaminated material shall be directly loaded for transport to the MISS or to a disposal site whenever possible. Temporary staging of contaminated material is allowed in accordance with the following paragraphs.

3.5.1 Staging Contaminated Material at the Site (Property)

Temporary staging of material shall be limited to the area within the excavation limits to prevent cross-contamination of clean areas. The following steps shall be taken to prevent the spread of excavated material:

- a. Geomembrane or 6 mil polyethylene tarpaulin cover to prevent precipitation from entering the stockpile. Scrim reinforced geomembrane covers shall have a minimum weight of 26 lbs. per 1000 square feet. The cover material shall be secured as required to prevent it from being removed by wind and to direct storm water away from the stockpile.
- b. Berms, hay bales, or silt fence shall surround any staged material left on site for more than one day and shall be a minimum of 12 inches in height.

3.5.2 Water Management

Any water or liquid collected from excavations and staged material shall be handled and disposed of in accordance with the WMP.

3.6 SPILLS

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Site Safety and Health Officer (SSHO) shall be notified immediately. If the spill exceeds the reporting threshold, the pre-established procedures as described in the GEPP for immediate reporting and containment shall be followed. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the SSHO, additional sampling and testing shall be performed to verify spills have been cleaned up.

3.7 BACKFILL

Excavations shall be backfilled immediately after all contaminated materials have been removed and Final Status Survey results have been approved by the Contracting Officer or designee. Backfilling and compaction requirements are specified in Section 02300 Earthwork.

3.8 DISPOSAL REQUIREMENTS

Offsite disposal of contaminated material shall be in accordance with the latest revision of the MHTDP.

3.9 CLOSEOUT REPORT

A Closeout Report shall be prepared in accordance with the Construction Work Plan.

-- End of Section --

SECTION 02230

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 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.

1.1.2 Grubbing

Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

1.2 REFERENCES

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

STONE & WEBSTER, INC.

MHTDP

Material Handling, Transportation, and
Disposal Plan, FUSRAP Maywood Superfund
Site

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING

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 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 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, as indicated on the drawings, that obtrude, encroach upon, or otherwise obstruct the work.

3.2 GRUBBING

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 18 inches below the original surface level of the ground in areas indicated for cleanup. Grubbed material shall be disposed of in accordance with the MHTDP, as required.

3.3 TREE REMOVAL

Where indicated or directed, trees and stumps 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 the MHTDP, as required.

3.4 DISPOSAL OF MATERIALS

Logs, stumps, roots, rotten wood, and other refuse from the clearing and grubbing operations, shall be shredded or cut into pieces suitable for transport and disposal in accordance with the MHTDP, as required.

-- End of Section --

SECTION 02300

EARTHWORK

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 in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 136	(1996a) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 422	(1963; R 1998) Particle-Size Analysis of Soils
ASTM D 1140	(1997) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 1557	(1998) 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	(1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 2937	(1994) Density of Soil in Place by the Drive-Cylinder Method
ASTM D 3017	(1988; R 1996e1) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1998) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

NEW JERSEY ADMINISTRATIVE CODE (NJAC)

NJAC 7:26D Cleanup Standards for Contaminated Sites,
proposed Rule

NJAC 7:26E Technical Requirements for Site Remediation

STONE & WEBSTER, INC.

CQCP Contractor Quality Control Plan, FUSRAP
Maywood Superfund Site

MHTDP Material Handling, Transportation, and
Disposal Plan, FUSRAP Maywood Superfund
Site

1.2 DEFINITIONS

1.2.1 Cohesionless and Cohesive Materials

Cohesionless materials 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, SW-SM, and SM will be identified as cohesionless only when the fines are nonplastic. Testing required for classifying materials shall be in accordance with ASTM D 4318, ASTM C 136, ASTM D 422, and ASTM D 1140.

1.2.2 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 as a percent of laboratory maximum density.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP:

SD-06 Test Reports

Testing; G.

Physical test results shall be available for review and shall be submitted at the completion of each cluster, including moisture-density and grain size curves and results of tests.

Compaction; FIO.

Backfill Material; G

Physical, chemical and radiological testing results of borrow material shall be available for review and shall be submitted at the completion of each cluster.

SD-08 Statements

Earthwork; G

Proposed source of borrow material (Borrow Study).
Qualifications of the commercial testing laboratory; FIO

SD-13 Certificates

Testing; FIO.

Qualifications of the commercial testing laboratory or Contractor's testing facilities.

SD-18 Records

Earthwork; FIO.

1.4 SUBSURFACE DATA

Subsurface investigation reports and soil boring logs are available for review at the FMSS. These data represent the best subsurface information available; however, variations may exist in the subsurface between boring locations.

1.5 CLASSIFICATION OF EXCAVATION

Unless otherwise noted on the drawings, all excavation shall be conducted in accordance with Section 02111 Excavation and Handling of Contaminated Material.

1.6 UTILIZATION OF EXCAVATED MATERIALS

Materials excavated shall be disposed of in accordance with the MHTDP.

PART 2 PRODUCTS

2.1 BACKFILL AND BEDDING MATERIALS

Backfill materials shall be obtained from on-site and offsite locations. Backfill shall be free from deleterious material, trash, debris, snow, ice or frozen materials. Backfill materials shall be tested for classification (ASTM D2487), grain-size distribution (ASTM D 422) and compaction characteristics (ASTM D 1557) at an approximate frequency of once per 5000 cubic yards. A minimum of one set of classification and compaction tests shall be performed per borrow source or when a material change is visually identified in the source.

The fill material shall be of equal or less permeability than the native soil in or adjacent to the excavation, or at a minimum have a permeability equal to or less than loam, in accordance with NJAC 7:26E-6.4(b)2. Fill material used for structural application (i.e. foundation support, pavement support, pipe bedding) shall be exempt from this requirement.

Backfill material shall be free from both chemical and radiological contamination. Each source of backfill material shall also meet the chemical criteria set forth in the NJAC 7:26D-6.2. Borrow sources must be accessible for inspection and collection of soil samples for chemical, radiological and physical testing. The Project Engineer will verify that the each borrow source is free from radiological contamination.

The supplier shall provide a written statement that, to the best of the supplier's knowledge and belief, the fill from each source being provided is not contaminated pursuant to any applicable remediation standards. Backfill sources shall be tested at the frequency listed below with a minimum of 1 sample per source:

Chemical Parameter	Approximate Test Frequency*	Regulatory Limit
TCL Organics	1 per 5000 cy	NJAC 7:26D
TAL Metals	1 per 5000 cy	NJAC 7:26D
Radiological Parameters	1 per 1000 cy (on-site screening)	Ra-226 1.209 pCi/g +/-2SD** Th-232 0.753 pCi/g +/-2SD U-238 1.635 pCi/g +/-2SD
	1 per 5000 cy (Alpha Spectroscopy by certified laboratory)	

* A minimum of one set of radiological and chemical parameters of the backfill will be determined for each property at which the backfill is placed.

** Standard Deviation as determined by the Background Study, November 2001.

Backfill shall not be used until borrow source chemical, radiological, and physical test results have been submitted and approved. Backfill shall arrive within 5% of optimum moisture.

2.1.1 SELECT (STRUCTURAL) FILL

Select Fill shall be classified in accordance with ASTM D2487 as SW, SP, SW-SM or SM. Select fill shall be a well-graded granular material; the maximum particle size shall be no greater than 2 inches in its longest dimension. Less than 30 percent by weight should be retained on the No. 4 sieve and no more than 12 percent should pass the No. 200 sieve.

2.1.2 COMMON FILL

Common Fill shall be classified in accordance with ASTM D2487 as GM, GP, SW, SM, SC or ML. The maximum particle size shall be no greater than 3 inches in any one dimension.

PART 3 EXECUTION

3.1 GENERAL EXCAVATION

Excavation shall be as specified in Section 02111 Excavation and Handling of Contaminated Materials.

3.2 BACKFILL

Excavations shall be backfilled immediately after all contaminated materials have been removed and Final Status Survey results have been

approved. Ground surface on which backfill is to be placed shall be prepared as specified in paragraph SUBGRADE PREPARATION.

Approved compacted subgrades that are disturbed by construction operations or adverse weather shall be scarified and compacted as specified herein to the required density prior to further construction thereon. Recompaction over underground utilities shall be by hand-tamping within 2 diameters or 12 inch, whichever is greater, of the utility.

3.3 SUBGRADE PREPARATION

3.3.1 Subgrade for Excavation Backfill

Subgrade shall be shaped to line, grade, and cross section. Subgrades shall be proof-rolled prior to fill placement. All soft or loose areas shall be reworked to provide adequate bearing for fill placement. Subgrades shall be inspected and approved by the Project Engineer or his/her designee prior to fill placement.

3.3.2 Subgrade for Railroads

Subgrades that occur within 12 inches of subballast or ballast shall be scarified for a depth of 12 inches, windrowed, reshaped and proof-rolled prior to fill placement.

3.3.3 Subgrade for Pavements

Subgrades that occur within 12 inches of pavement base course shall be scarified for 12 inches, windrowed, reshaped, and proof-rolled prior to fill placement.

3.4 BACKFILL PLACEMENT AND COMPACTION

Backfill shall be placed in horizontal lifts not exceeding 12 inches in loose thickness, or 6 inches when hand-operated compactors are used. After placing, each layer shall be plowed, disked or otherwise broken up, moistened, aerated or mixed as necessary, and compacted as specified. Fill placement shall not begin until subgrades have been tested and/or approved, forms removed, and the excavation cleaned of trash and debris. Fill shall not be placed through standing water or on frozen areas. Each layer of fill and backfill placed in structural areas (e.g., railroads, roadways, paved areas, adjacent to utilities) shall be compacted to at least 95 percent of the maximum dry density. Each layer of fill and backfill placed in non-structural areas shall be compacted to not less than 85 percent of the maximum dry density.

Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment depending on the backfill soil classification.

3.5 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas shall be within 0.1 foot of the grades and elevations indicated. Gutters and ditches shall be finished in a manner that will result in effective drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials.

3.6 TESTING

Field in-place density shall be determined in accordance with ASTM D 2922. Calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. 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 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 at the beginning of a job on each different type of material encountered and at intervals as directed by the Project Engineer or his/her designee. When test results indicate, as determined by the Contracting Officer, that compaction is not as specified, the material shall be removed, replaced and recompacted to meet specification requirements. Tests on recompacted areas shall be performed to determine conformance with specification requirements. Inspections and test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the direct supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests. The following number of tests, if performed at the appropriate time, will be the minimum acceptable for each type operation.

3.6.1 In-Place Densities

- a. One test per 20000 square feet, or fraction thereof, of each lift of fill or backfill areas.
- b. One test per 500 linear feet, or fraction thereof, of each lift of embankment or backfill for railroads, or utilities.
- c. In non-structural areas, the frequency of in-place density testing may be reduced by the Project Engineer or his/her designee.

3.6.2 Check Tests on In-Place Densities

If ASTM D 2922 is used, in-place densities shall be checked by ASTM D 1556 as follows:

- a. One check test per lift for each 200000 square feet, or fraction thereof, of each lift of fill or backfill compacted.
- b. One check test per lift for each 5000 linear feet, or fraction thereof, of embankment or backfill for railroads, or utilities.

3.6.3 Tolerance Tests for Subgrades

Checks on the degree of finish specified in paragraph FINISHING shall be made during construction of the subgrades.

3.7 SUBGRADE PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the

Contractor in a satisfactory condition until backfill, ballast, subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade will not be permitted. No backfill, subbase, base course, ballast, or pavement shall be laid until the subgrade has been checked and approved, and in no case shall backfill, subbase, base, surfacing, pavement, or ballast be placed on a muddy, spongy, or frozen subgrade.

-- End of Section --

SECTION 02316

EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS

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 in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 1557 (1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))

ASTM D 2487 (1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

STONE & WEBSTER, INC.

CQCP Contractor Quality Control Plan, FUSRAP Maywood Superfund Site

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 CFR, 1926 Subpart P AppA Soil Classification (Excavations)

1.2 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.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP

SD-06 Test Reports

Field Density Tests; FIO.
Testing of Backfill Materials; FIO.

Copies of all laboratory and field test reports shall be available for inspection on request and shall be submitted with the closeout report.

SD-08 Statements

EARTHWORK
Qualifications of the commercial testing laboratory; FIO

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Cohesionless and Cohesive Materials

Cohesionless materials shall include materials classified in ASTM D 2487 as GW, GP, SW, and SP. Cohesive materials shall include materials classified as GC, SC, ML, CL, MH, and CH. Materials classified as GM, SW-SM and SM shall be identified as cohesionless only when the fines are nonplastic.

2.1.2 Unyielding Material

Unyielding material shall consist of rock and gravelly soils with stones greater than 3 inches in any dimension or as defined by the pipe manufacturer, whichever is smaller.

2.1.3 Unstable Material

Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

2.1.4 Select Granular Material

Select granular material shall 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 No. 200 mesh sieve and no less than 95 percent by weight passing the 1 inch sieve. The maximum allowable aggregate size shall be 3 inches, or the maximum size recommended by the pipe manufacturer, whichever is smaller.

2.1.5 Initial Backfill Material

Initial backfill shall consist of select granular material or satisfactory material that is free from rocks 1 inch or larger in any dimension or that is free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller.

2.2 PLASTIC MARKING TAPE

Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Tape shall have a minimum strength of 1750 psi lengthwise and 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 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

Excavation shall be performed in accordance with Section 02111 Excavation and Handling of Contaminated Materials

3.1.1 Trench Excavation Requirements

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 required to accommodate the pipe size detailed on the contract drawings. Where no manufacturer's installation manual is available, trench walls shall be made vertical. Trench walls more than 4 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 feet high shall be shored, braced or cut. Trench walls which are cut back shall be excavated to the slopes shown on the drawings, or where not shown, trench walls shall be excavated to slopes 1H:1V for OSHA type B soils and 1.5H:1V for OSHA type C soils. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width below the top of pipe shall not exceed 24 inches plus pipe outside diameter (O.D.) for pipes of less than 24 inches inside diameter and shall not exceed 36 inches plus pipe outside diameter for sizes larger than 24 inches inside diameter.

3.1.1.1 Bottom Preparation

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 1 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

Where unyielding material is encountered in the bottom of the trench, such material shall be removed 6 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.

3.1.1.4 Excavation for Appurtenances

Excavation for manholes, catch-basins, inlets, or similar structures shall be 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.

3.1.2 Stockpiles

Stockpiles of soil shall be performed in accordance with Section 02111 Excavation and Removal of contaminated Soils.

3.2 BACKFILLING AND COMPACTION

Backfill shall be placed in accordance with Section 02300 Earthwork.

3.2.1 Trench Backfill

Trenches shall be backfilled to the grade shown. 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 6 inches loose thickness.

3.2.1.3 Bedding Initial Backfill

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 shall be backfilled in accordance with Section 02300 Earthwork.

3.2.2 Backfill for Appurtenances

After the manhole, catchbasin, inlet, or similar structure has been constructed, 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 Plastic Marking Tape

Warning tapes shall be installed directly above the pipe, at a depth of 18 inches below finished grade unless otherwise shown.

3.4 TESTING

3.4.1 Testing Facilities

Tests shall be performed by an approved commercial testing laboratory as specified in Section 02300 Earthwork.

3.4.2 Testing of Backfill Materials

Backfill material and select granular bedding material testing shall be performed in accordance with Section 02300 Earthwork.

3.4.3 Field Density Tests

Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained. Moisture-density testing shall be in accordance with Section 02300 Earthwork. Field in-place density shall be determined in accordance with Section 02300 Earthwork. Trenches improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified.

3.4.4 Displacement of Sewers

After other required tests have been performed and the trench backfill compacted to 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 Field Engineer. Pipe sizes larger than 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 Field Engineer, 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.

-- End of Section --

SECTION 02635

PAVEMENT RESTORATION

PART 1 GENERAL

1.1 SCOPE

This section provides the requirements for all labor, tools, materials, equipment, supervision, testing and incidentals required to perform all temporary and permanent paving.

1.2 REFERENCES

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.

NEW JERSEY DEPARTMENT OF TRANSPORTATION

NJDOT Standard Specifications (1996) New Jersey Department of
Transportation Standard Specifications for
Road and Bridge Construction

STONE & WEBSTER, INC.

CQCP Contractor Quality Control Plan, FUSRAP
Maywood Superfund Site

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP.

SD-01 Data

Traffic Marking Paint;G.

SD-06 Test Reports

Asphalt Testing;G.

SD-09 Manufacturers Instructions

Traffic Marking Paint;FIO.

SD-13 Certificates

Mix Design I-2;G.
Mix Design I-5;G.
Prime Coat;G.
Tack Coat;G.
Subbase;G.

Certificates shall be signed by the supplier.

PART 2 PRODUCTS

2.1 PRODUCTS

2.1.1 Paving Materials (Job-Mix Designs)

1. Bituminous Stabilized Base (Mix I-2) shall conform to the NJDOT Standard Specifications.
2. Surface course (Mix I-5) shall conform to the NJDOT Standard Specifications, as amended.
3. Subbase shall be Dense Graded Aggregate, AASHTO No. 57, as shown on Table 901-1 of the NJDOT Standard Specifications.
4. Prime and Tack Coat: Per Section 404.13 of NJDOT Standard Specifications.

2.1.2 Traffic Marking

1. Provide traffic marking paint with chlorinated rubber base.
2. Provide factory-mixed, quick-drying and non-bleeding; FS TT-P-115, Type III.
3. Color: In accordance with the Borough of Maywood, Borough of Lodi, and County of Bergen and NJDOT requirements.

PART 3 EXECUTION

3.1 PAVEMENT RESTORATION

3.1.1 Driveways, Private Roads, Parking Lots, and Entrances

1. CONTRACTOR shall completely restore all driveways, private roads, parking lots, and entrances in kind to their preconstruction widths and conditions as shown on the design drawings and specifications.

3.1.2 General

1. Subgrades
Subgrades shall be prepared in accordance with Section 02300 Earthwork.
2. Base Course
Aggregate Base Course shall be constructed in accordance with NJDOT Standard Specifications Section 301.

3. Bituminous Stabilized Base Course
Bituminous stabilized base course shall be constructed in accordance with NJDOT Standard Specifications Section 305.
4. Surface Course
Surface course shall be constructed in accordance with NJDOT Standard Specifications Section 404.
5. Overlays
 - a. Mill bituminous pavement to depth shown and disposed of milling.
 - b. Mix I-5 shall be used as the surface course. Before being placed, the base course shall be swept clean and then covered with a uniform tack coat at the rate of 0.10 gallon per square yard. Edges of the trench shall be thoroughly painted with the same material in addition to the 0.10 gallon per square yard.
 - c. After tack coating, the surface material shall be immediately spread and raked to conform with the existing pavement.

3.2 PAVEMENT QUALITY REQUIREMENTS

3.2.1 General

In addition to other specified conditions, comply with following minimum requirement for Asphalt Testing.

1. Provide final surfaces of uniform texture, conforming to required grades and cross sections.

3.2.2 Density

Compare density of in-place material against laboratory specimen or certificates on same bituminous concrete mixture. Use nuclear devices to determine densities. A minimum of one in-place density test shall be performed for every 500 square yards of pavement and a minimum of one in-place density test for each property at which pavement is constructed.

Minimum acceptable density of in-place course material will be 90 percent of the recorded laboratory specimen or certificate density. Maximum acceptable density will be 98 percent.

3.2.3 Thickness

In-place thicknesses shall average not less than the thicknesses specified or shown.

3.2.4 Surface Smoothness

Test finished surface of each bituminous concrete or concrete course for smoothness, using a 10-foot straight edge applied parallel to and at right angles to centerline of paved areas.

Surface course will not be acceptable if smoothness test results exceed $\frac{1}{4}$ -inch in 10 feet at any location.

- 1) Surfaces will not be acceptable if varying more than $\frac{1}{4}$ -inch from the template.

2) Surface will not be acceptable if visible ponding is apparent (other than surface dampness) at the discretion of the Project Engineer.

3.3 PATCHING

As directed by the Project Engineer, remove and replace all defective areas. Cut out such areas and fill with fresh bituminous or Portland Cement, concrete, as applicable. Compact to the required density.

3.4 CLEANING AND PROTECTION

Cleaning: After completion of paving operations, clean surfaces of excess or spilled bituminous or concrete materials and all foreign matter.

Protect newly finished pavement until it has become properly hardened, cooled or cured.

Cover openings of drainage structures in the area of paving until permanent coverings are placed.

3.5 MARKING PAVEMENT

3.5.1 General

New pavement shall be marked to replace the pavement markings that existed prior to construction. Surface shall be prepared for painting in accordance with paint manufacturers requirements.

3.5.2 Cleaning

Sweep surface with power broom supplemented by hand brooms to remove loose material and dirt.

-- End of Section --

SECTION 02770

CONCRETE SIDEWALKS, CURBS AND GUTTERS

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 in the text by basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO M 182 (1991) Burlap Cloth Made from Jute or Kenaf

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 143 (1990a) Slump of Hydraulic Cement Concrete

ASTM C 171 (1997) Sheet Materials for Curing Concrete

ASTM C 309 (1997) Liquid Membrane-Forming Compounds
for Curing Concrete

ASTM C 920 (1995) Elastomeric Joint Sealants

ASTM D 1751 (1983; R 1991) Preformed Expansion Joint
Filler for Concrete Paving and Structural
Construction (Nonextruding and Resilient
Bituminous Types)

ASTM D 1752 (1984; R 1996) Preformed Sponge Rubber and
Cork Expansion Joint Fillers for Concrete
Paving and Structural Construction

ASTM D 3405 (1996) Joint Sealants, Hot-Applied, for
Concrete and Asphalt Pavements

STONE & WEBSTER, INC.

CQCP Contractor Quality Control Plan, FUSRAP
Maywood Superfund Site

NEW JERSEY DEPARTMENT OF TRANSPORTATION

NJDOT Standard Specifications (1996) New Jersey Department of
Transportation Standard Specifications for
Road and Bridge Construction

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "FIO" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP:

In lieu of laboratory reports, if any, required in the NJDOT Standard Specifications, the CONTRACTOR may submit certificates of compliance for the following concrete materials:

SD-03 Product Data

Joint Sealant; G
Curing Compounds; G

SD-06 Test Reports

Field Quality Control; FIO.

SD-09 Manufacturers Instructions

Joint Sealant; FIO
Curing Compounds; FIO

SD-13 Certificates

Concrete Mix-Design; G
Concrete Admixtures; G
Reinforcing Steel and Wire Mesh; G
Joint Sealant; G
Curing Compounds; G

Certificates shall certify that materials, mixtures and plant comply with Specification requirements.

Certificates shall be signed by the supplier.

SD-18 Records

Concrete; FIO.

Copies of certified delivery tickets for all concrete used in the construction.

1.3 WEATHER LIMITATIONS

1.3.1 Placing During Cold Weather

Concrete placement shall not take place when the air temperature reaches 40 degrees F and is falling, or is already below that point. Placement may begin when the air temperature reaches 35 degrees F and is rising, or is already above 40 degrees F. Provisions shall be made to protect the concrete from freezing during the specified curing period. If necessary to place concrete when the temperature of the air, aggregates, or water is below 35 degrees F, placement and protection shall be approved in writing by the Project Engineer. Approval will be contingent upon full conformance with the following provisions. The underlying material shall be prepared

and protected so that it is entirely free of frost when the concrete is deposited. Mixing water and aggregates shall be heated as necessary to result in the temperature of the in-place concrete being between 50 and 85 degrees F. Methods and equipment for heating shall be approved by the Project Engineer. The aggregates shall be free of ice, snow, and frozen lumps before entering the mixer. Covering and other means shall be provided for maintaining the concrete at a temperature of at least 50 degrees F for not less than 72 hours after placing, and at a temperature above freezing for the remainder of the curing period.

1.3.2 Placing During Warm Weather

The temperature of the concrete as placed shall not exceed 85 degrees F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. The placing temperature shall not exceed 95 degrees F at any time.

1.4 PLANT, EQUIPMENT, MACHINES, AND TOOLS

1.4.1 General Requirements

Plant, equipment, machines, and tools used in the work shall be subject to approval by the Project Engineer and shall be maintained in a satisfactory working condition at all times. The equipment shall have the capability of producing the required product, meeting grade controls, thickness control and smoothness requirements as specified. Use of the equipment shall be discontinued if it produces unsatisfactory results.

PART 2 PRODUCTS

2.1 CONCRETE

Concrete Mix-Design shall meet the requirements of New Jersey State Mix, Class B, as shown on Table 914-1 of the NJDOT Standard Specifications, for curbing and sidewalks.

2.1.1 Air Content

Mixtures shall have air content by volume of concrete of 5 to 7 percent, based on measurements made immediately after discharge from the mixer.

2.1.2 Slump

The concrete slump shall be 3 inches plus or minus 1 inch where determined in accordance with ASTM C 143.

2.1.3 Cement

The type of cement shall be Type II Portland or other cement as required to achieve concrete characteristics specified.

2.1.4 Air-Entraining Admixtures

Air entraining admixtures, (Concrete Admixtures), which are added to concrete mixtures shall conform to Section 905 of the NJDOT Standard Specifications.

2.1.5 Aggregates

Fine aggregate shall be sand that is clean, sharp and coarse, free from clay, loam or other foreign matter.

Coarse aggregate shall be broken trap rock ¾" size, clean and free from foreign matter.

2.1.6 Reinforcement Steel

Reinforcing steel and welded wire steel mesh shall conform to the requirements of the NJDOT Standard Specifications Section 915.

2.2 CONCRETE CURING MATERIALS

2.2.1 Impervious Sheet Materials

Impervious sheet materials shall conform to ASTM C 171, type optional, except that polyethylene film, if used, shall be white opaque.

2.2.2 Burlap

Burlap shall conform to AASHTO M 182.

2.2.3 White Pigmented Membrane-Forming Curing Compound

White pigmented membrane-forming curing compound shall conform to ASTM C 309, Type 2.

2.3 JOINT FILLER STRIPS

2.3.1 Contraction Joint Filler for Curb and Gutter

Contraction joint filler for curb and gutter shall consist of hard-pressed fiberboard.

2.3.2 Expansion Joint Filler, Premolded

Expansion joint filler, premolded, shall conform to ASTM D 1751 or ASTM D 1752, 3/8 inch thick, unless otherwise indicated.

2.4 JOINT SEALANTS

2.4.1 Joint Sealant, Cold-Applied

Joint sealant, cold-applied shall conform to ASTM C 920.

2.4.2 Joint Sealant, Hot-Poured

Joint sealant, hot-poured shall conform to ASTM D 3405.

2.5 FORM WORK

Form work shall be designed and constructed to ensure that the finished concrete will conform accurately to the indicated dimensions, lines, and elevations, and within the tolerances specified. Forms shall be of wood or steel, straight, of sufficient strength to resist springing during depositing and consolidating concrete. Wood forms shall be surfaced plank, 2 inches nominal thickness, straight and free from warp, twist, loose

knots, splits or other defects. Wood forms shall have a nominal length of 10 feet. Radius bends may be formed with 3/4 inch boards, laminated to the required thickness. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Ends of steel forms shall be interlocking and self-aligning. Steel forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Steel forms shall have a nominal length of 10 feet with a minimum of 3 welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips designed for use with steel forms.

2.5.1 Sidewalk Forms

Sidewalk forms shall be of a height equal to the full depth of the finished sidewalk.

2.5.2 Curb and Gutter Forms

Curb and gutter outside forms shall have a height equal to the full depth of the curb or gutter. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form. Rigid forms shall be provided for curb returns, except that benders or thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together. In lieu of inside forms for curbs, a curb "mule" may be used for forming and finishing this surface, provided the results are approved.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

The subgrade shall be constructed to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted in conformance with Section 02300 Earthwork.

3.1.1 Maintenance of Subgrade

The subgrade shall be maintained in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited.

3.2 FORM SETTING

Forms shall be set to the indicated alignment, grade and dimensions. Forms shall be held rigidly in place by a minimum of 3 stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing

temperatures, oiling is mandatory.

3.2.1 Sidewalks

Forms for sidewalks shall be set with the upper edge true to line and grade with an allowable tolerance of 1/8 inch in any 10 foot long section. After forms are set, grade and alignment shall be checked with a 10 foot straightedge. Forms shall have a transverse slope of 1/4 inch per foot with the low side adjacent to the roadway. Side forms shall not be removed for 12 hours after finishing has been completed.

3.2.2 Curbs and Gutters

The forms of the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished, as specified for concrete finishing. Gutter forms shall not be removed while the concrete is sufficiently plastic to slump in any direction.

3.3 SIDEWALK CONCRETE PLACEMENT AND FINISHING

3.3.1 Formed Sidewalks

Concrete shall be placed in the forms in one layer. When consolidated and finished, the sidewalks shall be of the thickness indicated. After concrete has been placed in the forms, a strike-off guided by side forms shall be used to bring the surface to proper section to be compacted. The concrete shall be consolidated with an approved vibrator, and the surface shall be finished to grade with a strike off.

3.3.2 Concrete Finishing

After straightedging, when most of the water sheen has disappeared, and just before the concrete hardens, the surface shall be finished with a wood float or darby to a smooth and uniformly fine granular or sandy texture free of waves, irregularities, or tool marks. A scored surface shall be produced by brooming with a fiber-bristle brush in a direction transverse to that of the traffic, followed by edging.

3.3.3 Edge and Joint Finishing

All slab edges, including those at formed joints, shall be finished with an edger having a radius of 1/8 inch. Transverse joint shall be edged before brooming, and the brooming shall eliminate the flat surface left by the surface face of the edger. Corners and edges which have crumbled and areas which lack sufficient mortar for proper finishing shall be cleaned and filled solidly with a properly proportioned mortar mixture and then finished.

3.3.4 Surface and Thickness Tolerances

Finished surfaces shall not vary more than 5/16 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/2 inch. as measured at the edge of sidewalk

3.4 CURB AND GUTTER CONCRETE PLACEMENT AND FINISHING

3.4.1 Formed Curb and Gutter

Concrete shall be placed to the section required in a single lift. Consolidation shall be achieved by using approved mechanical vibrators. Curve shaped gutters shall be finished with a standard curb "mule".

3.4.2 Curb and Gutter Finishing

Approved slipformed curb and gutter machines may be used in lieu of hand placement.

3.4.3 Concrete Finishing

Exposed surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes. The edges of the gutter and top of the curb shall be rounded with an edging tool to a radius of 1/2 inch. Immediately after removing the front curb form, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until blemishes, form marks, and tool marks have been removed. The front curb surface, while still wet, shall be brushed in the same manner as the gutter and curb top. The top surface of gutter and entrance shall be finished to grade with a wood float.

3.4.4 Joint Finishing

Curb edges at formed joints shall be finished as indicated.

3.4.5 Surface and Thickness Tolerances

Finished surfaces shall not vary more than 1/4 inch from the testing edge of a 10-foot straightedge. Permissible deficiency in section thickness will be up to 1/4 inch. as measured at the edge

3.5 SIDEWALK JOINTS

Sidewalk joints shall be constructed to divide the surface into rectangular areas. Transverse contraction joints shall be spaced at a distance equal to the sidewalk width or 5 feet on centers, whichever is less, and shall be continuous across the slab. Longitudinal contraction joints shall be constructed along the centerline of all sidewalks 10 feet or more in width. Transverse expansion joints shall be installed at sidewalk returns and opposite expansion joints in adjoining curbs. Where the sidewalk is not in contact with the curb, transverse expansion joints shall be installed as indicated. Expansion joints shall be formed about structures and features which project through or into the sidewalk pavement, using joint filler of the type, thickness, and width indicated.

3.5.1 Sidewalk Contraction Joints

The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least one-fourth of the sidewalk slab thickness, using a jointer to cut the groove, or by sawing a groove in the hardened concrete with a power-driven saw, unless otherwise approved. Sawed joints shall be constructed by sawing a groove in the concrete with a 1/8 inch blade to the depth indicated. An ample supply of saw blades shall be available on the job before concrete placement is started, and at least one standby sawing unit in good working order shall be available at the jobsite at all times during the sawing operations.

3.5.2 Sidewalk Expansion Joints

Expansion joints shall be formed with 3/8 inch joint filler strips. Joint filler shall be placed with top edge 1/4 inch below the surface and shall be held in place with steel pins or other devices to prevent warping of the filler during floating and finishing. Immediately after finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/8 inch, and concrete over the joint filler shall be removed. At the end of the curing period, expansion joints shall be cleaned and filled with joint sealant. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.5.3 Reinforcement Steel Placement

Reinforcement steel shall be accurately and securely fastened in place with suitable supports and ties before the concrete is placed.

3.6 CURB AND GUTTER JOINTS

Curb and gutter joints shall be constructed at right angles to the line of curb and gutter.

3.6.1 Contraction Joints

Contraction joints shall be constructed directly opposite contraction joints in abutting portland cement concrete pavements and spaced so that monolithic sections between curb returns will not be less than 5 feet nor greater than 15 feet in length. Contraction joints shall be constructed by means of 1/8 inch thick separators and of a section conforming to the cross section of the curb and gutter. Separators shall be removed as soon as practicable after concrete has set sufficiently to preserve the width and shape of the joint and prior to finishing.

3.6.2 Expansion Joints

Expansion joints shall be formed by means of preformed expansion joint filler material cut and shaped to the cross section of curb and gutter. Expansion joints shall be provided in curb and gutter directly opposite expansion joints of abutting portland cement concrete pavement, and shall be of the same type and thickness as joints in the pavement. Where curb and gutter do not abut portland cement concrete pavement, expansion joints at least 3/8 inch in width shall be provided at intervals not exceeding 20 feet. Expansion joints shall be provided in nonreinforced concrete gutter at locations indicated. Expansion joints shall be sealed immediately following curing of the concrete or as soon thereafter as weather conditions permit. Expansion joints and the top 1 inch depth of curb and gutter contraction-joints shall be sealed with joint sealant. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing material shall not be spilled on exposed surfaces of the concrete. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 50 degrees F at the time of application of joint sealing material. Excess material on exposed surfaces of the concrete shall be removed immediately and concrete surfaces cleaned.

3.7 CURING AND PROTECTION

3.7.1 General Requirements

Concrete shall be protected against loss of moisture and rapid temperature changes for at least 7 days from the beginning of the curing operation. Unhardened concrete shall be protected from rain and flowing water. All equipment needed for adequate curing and protection of the concrete shall be on hand and ready for use before actual concrete placement begins. Protection shall be provided as necessary to prevent cracking of the pavement due to temperature changes during the curing period.

3.7.1.1 Mat Method

The entire exposed surface shall be covered with 2 or more layers of burlap. Mats shall overlap each other at least 6 inches. The mat shall be thoroughly wetted with water prior to placing on concrete surface and shall be kept continuously in a saturated condition and in intimate contact with concrete for not less than 7 days.

3.7.1.2 Impervious Sheeting Method

The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used. The curing medium shall not be less than 18-inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or a bank of moist earth placed along edges and laps in the sheets. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

3.7.1.3 Membrane Curing Method

A uniform coating of white-pigmented membrane-curing compound shall be applied to the entire exposed surface of the concrete as soon after finishing as the free water has disappeared from the finished surface. Formed surfaces shall be coated immediately after the forms are removed and in no case longer than 1 hour after the removal of forms. Concrete shall not be allowed to dry before the application of the membrane. If any drying has occurred, the surface of the concrete shall be moistened with a fine spray of water and the curing compound applied as soon as the free water disappears. Curing compound shall be applied in two coats by hand-operated pressure sprayers at a coverage of approximately 200 square feet per gallon for the total of both coats. The second coat shall be applied in a direction approximately at right angles to the direction of application of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. If pinholes, abrasion, or other discontinuities exist, an additional coat shall be applied to the affected areas within 30 minutes. Concrete surfaces that are subjected to heavy rainfall within 3 hours after the curing compound has been applied shall be resprayed by the method and at the coverage specified above. Areas where the curing compound is damaged by subsequent construction operations within the curing period shall be resprayed. Necessary precautions shall be taken to insure that the concrete is properly cured at sawed joints, and that no curing compound enters the joints. The top of the joint opening and the

joint groove at exposed edges shall be tightly sealed before the concrete in the region of the joint is resprayed with curing compound. The method used for sealing the joint groove shall prevent loss of moisture from the joint during the entire specified curing period. Approved standby facilities for curing concrete pavement shall be provided at a location accessible to the jobsite for use in the event of mechanical failure of the spraying equipment or other conditions that might prevent correct application of the membrane-curing compound at the proper time. Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected during the entire curing period from pedestrian and vehicular traffic, except as required for joint-sawing operations and surface tests, and from any other possible damage to the continuity of the membrane.

3.7.2 Backfilling

After curing, debris shall be removed and the area adjoining the concrete shall be backfilled, graded, and compacted to conform to the surrounding area in accordance with lines and grades indicated.

3.7.3 Protection

Completed concrete shall be protected from damage until accepted. The Contractor shall repair damaged concrete and clean concrete discolored during construction. Concrete that is damaged shall be removed and reconstructed for the entire length between regularly scheduled joints. Refinishing the damaged portion will not be acceptable. Removed damaged portions shall be disposed of as directed.

3.8 FIELD QUALITY CONTROL

3.8.1 General Requirements

The Contractor shall perform the inspection, tests and meet the specified requirements for testing as required by the NJDOT Standard Specifications.

Based upon the results of these inspections and tests, the Contractor shall take the action and submit reports as required below, and any additional tests to insure that the requirements of these specifications are met.

3.8.2 Concrete Testing

Concrete testing shall be conducted at the following frequency:

Slump Test	1 per truck-load
Air	1 per truck-load
Strength	1 per 100 cy or 1 per day (minimum)

Sampling and testing will be performed in accordance with section 914.04 of the NJDOT Standard Specifications except for slump test which will be in accordance with paragraph 2.1.2 of this section.

3.8.3 Surface Evaluation

The finished surface of each category of the completed work shall be uniform in color and free of blemishes and form or tool marks.

3.9 SURFACE DEFICIENCIES AND CORRECTIONS

3.9.1 Thickness Deficiency

When measurements indicate that the completed concrete section is deficient in thickness by more than 1/4 inch the deficient section will be removed, between regularly scheduled joints, and replaced.

3.9.2 High Areas

In areas not meeting surface smoothness and plan grade requirements, high areas shall be reduced either by rubbing the freshly finished concrete with carborundum brick and water when the concrete is less than 36 hours old or by grinding the hardened concrete with an approved surface grinding machine after the concrete is 36 hours old or more. The area corrected by grinding the surface of the hardened concrete shall not exceed 5 percent of the area of any integral slab, and the depth of grinding shall not exceed 1/4 inch.

Pavement areas requiring grade or surface smoothness corrections in excess of the limits specified above shall be removed and replaced.

3.9.3 Appearance

Exposed surfaces of the finished work will be inspected by the Government and any deficiencies in appearance will be identified. Areas which exhibit excessive cracking, discoloration, form marks, or tool marks or which are otherwise inconsistent with the overall appearances of the work shall be removed and replaced.

-- End of Section --

SECTION 02921

SEEDING

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 in the text by basic designation only.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01 (Aug 95) Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602 (1995a) Agricultural Liming Materials

ASTM D 977 (1991) Emulsified Asphalt

ASTM D 2028 (1976; R 1992) Cutback Asphalt (Rapid-Curing Type)

ASTM D 4972 (1995a) pH of Soils

ASTM D 5268 (1992; R 1996) Topsoil Used for Landscaping Purposes

ASTM D 5883 (1996) Standard Guide for Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes

STATE OF NEW JERSEY

NJSA 4:17-13 New Jersey State Seed Law

STONE & WEBSTER, INC.

CQCP Contractor Quality Control Plan, FUSRAP Maywood Superfund Site

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP.

SD-09 Manufacturers Instructions

a. Application of Pesticide; FIO

SD-13 Certificates

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

- a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
- b. Delivered Topsoil.;G Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.
- c. pH Adjuster.; G Calcium carbonate equivalent and sieve analysis.
- d. Fertilizer.; G Chemical analysis and composition percent.
- e. Organic Material; G Composition and source.
- f. Soil Conditioner; G Composition and source.
- g. Mulch; G Composition and source.
- h. Surface Erosion Control Material
- i. Asphalt Adhesive; G Composition.
- j. Pesticide.; G EPA registration number and registered uses.

SD-18 Records

- a. Maintenance Record; G
- b. Soil Test; FIO

1.3 SOURCE INSPECTION

The source of delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

Not Applicable

1.4.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to the site.

1.4.1.2 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.

1.4.1.3 Pesticides

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

1.4.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with seeding operation materials.

1.4.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Hydroseeding time limitation for holding seed in the slurry shall be a maximum 24 hours.

PART 2 PRODUCTS

2.1 SEED

2.1.1 Seed Classification

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. Seed shall be labeled to show that it meets the requirements of NJSA 4:17-13 et seq and rules promulgated thereto.

2.1.2 Permanent Seed Species and Mixtures

Permanent seed species and mixtures shall be turf type tall fescue (blend of 3 cultivars) or other approved seeds.

2.1.3 Temporary Seed Species

Temporary seed species for surface erosion control or overseeding shall be as follows:

Botanical Name	Common Name	Percent Pure Live Seed	Minimum Percent
Perennial Rye	Manhattan	95	90

2.1.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.1.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Field Engineer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and staged on site in accordance with Section 02111 EARTHWORK AND HANDLING OF CONTAMINATED MATERIAL. When additional topsoil is required beyond the available topsoil from stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the seed species specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash, or other material over a maximum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material and soil conditioners meeting the following requirements. Vermiculite shall not be used.

2.3.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, sulfur, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.3.1.1 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.3.1.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: A minimum 100 percent shall pass through a No. 8

sieve and a minimum 97 percent shall pass through a No. 60 sieve.

2.3.1.3 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 35 percent shall pass through a No. 60 sieve.

2.3.2 Fertilizer

It shall be as recommended by the soil test. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorous-potassium ratio. The fertilizer shall be derived from sulphur-coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.3 Nitrogen Carrier Fertilizer

It shall be as recommended by the soil test. Nitrogen carrier fertilizer shall be commercial grade, free flowing, and uniform in composition. The fertilizer may be a liquid nitrogen solution.

2.3.4 Organic Material

Organic material shall consist of either bone meal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.3.4.1 Bone meal

Bone meal shall be finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.3.4.2 Rotted Manure

Rotted manure shall be unleached horse, chicken or cattle manure containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials. It shall contain no chemicals or ingredients harmful to plants. The manure shall be heat treated to kill weed seeds and be free of stones, sticks, and soil.

2.3.4.3 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, yard trimmings, or other wood waste material that is free of stones, sticks, soil, and toxic substances harmful to plants, and is fully composted or stabilized with nitrogen.

2.3.4.4 Recycled Compost

Compost shall be a well decomposed, stable, weed free organic matter source. Compost shall be derived from food; agricultural or industrial residuals; biosolids (treated sewage sludge); yard trimmings; or source-separated or mixed solid waste. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent by

weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length.

2.3.4.5 Worm Castings

Worm castings shall be screened from worms and food source, and shall be commercially packaged.

2.3.5 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination to meet the requirements of the soil test.

2.3.5.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.3.5.2 Super Absorbent Polymers

To improve water retention in soils, super absorbent polymers shall be sized and applied according to the manufacturer's recommendations. Polymers shall be added as a soil amendment and be cross-linked polyacrylamide, with an absorption capacity of 250-400 times its weight. Polymers shall also be added to the seed and be a starch grafted polyacrylonitrile, with graphite added as a tacky sticker. It shall have an absorption capacity of 100 plus times its weight.

2.3.5.3 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent shall pass a No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.3.5.4 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum 95 percent calcium sulfate by volume.

2.3.5.5 Expanded Shale, Clay, or Slate (ESCS)

Rotary kiln produced ESCS material shall be in conformance with ASTM D 5883.

2.4 MULCH

Mulch shall be free from weeds, mold, and other deleterious materials. Mulch materials shall be native to the region.

2.4.1 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.

2.4.2 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.

2.4.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.4.4 Paper Fiber

Paper fiber mulch shall be recycled news print that is shredded for the purpose of mulching seed.

2.5 ASPHALT ADHESIVE

Asphalt adhesive shall conform to the following: Emulsified asphalt, conforming to ASTM D 977, Grade SS-1; and cutback asphalt, conforming to ASTM D 2028, Designation RC-70.

2.6 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant life.

2.7 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

2.8 SURFACE EROSION CONTROL MATERIAL

Surface erosion control material shall conform to the following:

2.8.1 Surface Erosion Control Blanket

Blanket shall be 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.

2.8.2 Surface Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.8.3 Surface Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.8.4 Surface Erosion Control Chemicals

Chemicals shall be high-polymer synthetic resin or cold-water emulsion of selected petroleum resins.

2.8.5 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 shall resist mold growth.

2.8.6 Erosion Control Material Anchors

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed from March 1 to October 15

3.1.2 Seeding Conditions

Seeding 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 seeding operations, proposed alternate times shall be submitted for approval.

3.1.3 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Project Engineer shall verify that finished grades are as indicated on drawings, and the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED SOILS, prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying pH Adjuster

The pH adjuster shall be applied as recommended by the soil test. The pH adjuster shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Fertilizer

The fertilizer shall be applied as recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.3 Applying Soil Conditioner

The soil conditioner shall be as recommended by the soil test. The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.2.4 Applying Super Absorbent Polymers

Polymers shall be spread uniformly over the soil as recommended by the manufacturer and thoroughly incorporated by tillage into the soil to a maximum 4 inch depth.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inch depth. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inch depth 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. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove debris.

3.2.4.2 Lawn Area Debris

Debris and stones over a minimum 5/8 inch in any dimension shall be removed from the surface.

3.2.4.3 Field Area Debris

Debris and stones over a minimum 3 inch in any dimension shall be removed from the surface.

3.2.4.4 Protection

Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing seed, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Installing Seed

Seeding method shall be Broadcast Seeding, Drill Seeding, or Hydroseeding. Seeding procedure shall ensure even coverage. Gravity feed applicators, which drop seed directly from a hopper onto the prepared soil, shall not be used because of the difficulty in achieving even coverage, unless otherwise approved. Absorbent polymer powder shall be mixed with the dry seed at the rate recommended by the manufacturer.

3.3.1.1 Broadcast Seeding

Seed shall be uniformly broadcast at the rate of 150 pounds per acre using broadcast seeders. Half the total rate of seed application shall be broadcast in 1 direction, with the remainder of the seed rate broadcast at 90 degrees from the first direction. Seed shall be covered a maximum 1/4 inch depth by disk harrow, steel mat drag, cultipacker, or other approved device.

3.3.1.2 Drill Seeding

Seed shall be uniformly drilled to a maximum 1/2 inch depth and at the rate of 150 pounds per acre, using equipment having drills a maximum 7 inches distance apart. Row markers shall be used with the drill seeder. Half the total rate of seed application shall be drilled in 1 direction, with the remainder of the seed rate drilled at 90 degrees from the first direction. The drilling equipment shall be maintained with half full seed boxes during the seeding operations.

3.3.2 Hydroseeding

Seed shall be mixed to ensure broadcast at the rate of 150 pounds per acre. Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Wood cellulose fiber mulch and tackifier 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.

3.3.3 Mulching

3.3.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 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 steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the

ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading.

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface; or other suitable equipment.

3.3.3.3 Asphalt Adhesive Tackifier

Asphalt adhesive tackifier shall be sprayed at a rate between 10 to 13 gallons per 1000 square feet. Sunlight shall not be completely excluded from penetrating to the ground surface.

3.3.3.4 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.5 Asphalt Adhesive Coated Mulch

Hay or straw mulch may be spread simultaneously with asphalt adhesive applied at a rate between 10 to 13 gallons per 1000 square feet, 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 penetrating to the ground surface.

3.3.3.6 Wood Cellulose Fiber, Paper Fiber, and Recycled Paper

Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.3.4 Watering Seed

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise directed. Watering of other adjacent areas or plant material shall be prevented.

3.4 SURFACE EROSION CONTROL

3.4.1 Surface Erosion Control Material

Where indicated or as directed, surface erosion control material shall be installed in accordance with manufacturer's instructions. Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade.

3.4.2 Temporary Seeding

The application rate shall be 40 lbs per acre. When directed during contract delays affecting the seeding operation or when a quick cover is

required to prevent surface erosion, the areas designated shall be seeded in accordance with temporary seed species listed under Paragraph SEED.

3.4.2.1 Soil Amendments

When soil amendments have not been applied to the area, the quantity of 1/2 of the required soil amendments shall be applied and the area tilled in accordance with paragraph SITE PREPARATION. The area shall be watered in accordance with paragraph Watering Seed.

3.4.2.2 Remaining Soil Amendments

The remaining soil amendments shall be applied in accordance with the paragraph Tillage when the surface is prepared for installing seed.

3.5 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted as directed.

3.6 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.6.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.6.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately. A pesticide plan shall be submitted.

3.7 RESTORATION AND CLEAN UP

3.7.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition.

3.7.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.8 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as required, or as directed.

3.9 SEED ESTABLISHMENT PERIOD

3.9.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 3 months after the last day of the seeding operation. When there is more than 1 seed establishment period, the boundaries of the seeded area covered for each period shall be described. The seed establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.9.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health when the grass plants are a minimum 1 inch high.

3.9.2.1 Field Area

A satisfactory stand of grass plants from the seeding operation for a field area shall be a minimum 10 grass plants per square foot. The total bare spots shall not exceed 2 percent of the total seeded area.

3.9.3 Maintenance During Establishment Period

Maintenance of the seeded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.9.3.1 Mowing

Grass Areas: Grass areas shall be mowed as required during the establishment period to maintain a maximum 5 inch height. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

3.9.3.2 Post-Fertilization

The fertilizer shall be applied as recommended by the soil test. A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning the installed grass plants.

3.9.3.3 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.9.3.4 Repair or Reinstall

Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.9.3.5 Maintenance Record

A record of each site visit shall be furnished, describing the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

SECTION 02922

SODDING

PART 1 GENERAL

1.1 REFERENCES

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602	(1995a) Agricultural Liming Materials
ASTM D 4972	(1995a) pH of Soils
ASTM D 5268	(1992; R 1996) Topsoil Used for Landscaping Purposes
ASTM D 5883	(1996) Standard Guide for Use of Rotary Kiln Produced Expanded Shale, Clay or Slate (ESCS) as a Mineral Amendment in Topsoil Used for Landscaping and Related Purposes

STONE & WEBSTER, INC.

CQCP	Contractor Quality Control Plan, FUSRAP Maywood Superfund Site
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1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with the CQCP.

SD-01 Data

Equipment; FIO.

A listing of equipment to be used for the sodding operation.

Finished Grade and Topsoil; FIO.

Finished grade status.

Soil Test; FIO.

Certified reports of inspections and laboratory tests, prepared by an independent testing agency, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

SD-13 Certificates

Sod; FIO.
Topsoil; G.
pH Adjuster; FIO.
Fertilizer; FIO.
Organic Material; FIO.
Soil Conditioner; FIO.
Pesticide; FIO.

Prior to the delivery of materials, certificates of compliance attesting that materials meet the specified requirements. Certified copies of the material certificates shall include the following:

- a. Sod. Classification, botanical name, common name, mixture percentage of species, percent purity, quality grade, field location and state certification.
- b. Topsoil. Particle size, pH, organic matter content, textural class, soluble salts, chemical and mechanical analyses.
- c. pH Adjuster. Calcium carbonate equivalent and sieve analysis.
- d. Fertilizer. Chemical analysis and composition percent.
- e. Organic Material: Composition and source.
- f. Soil Conditioner: Composition and source.
- g. Pesticide. EPA registration number and registered uses.

SD-18 Records

Maintenance Record; FIO.

Maintenance work performed, area repaired or reinstalled, diagnosis for unsatisfactory stand of grass plants.

Application of Pesticide; FIO.

Pesticide treatment plan with sequence of treatment work with dates and times. The pesticide trade name, EPA registration number, chemical composition, formulation, concentration of original and diluted material, application rate of active ingredients, method of application, area treated, amount applied; and the name and state license number of the state certified applicator shall be included.

1.3 SOURCE INSPECTION

The sources of sod material and delivered topsoil shall be subject to inspection.

1.4 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Delivery

Not Applicable

1.4.1.1 Sod

Sod shall be protected during delivery to prevent desiccation, internal heat buildup, or contamination.

1.4.1.2 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in paragraph TOPSOIL. A soil test shall be provided for topsoil delivered to the site.

1.4.1.3 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 Pesticides

Pesticide material shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses.

1.4.2 Inspection

Sod shall be inspected upon arrival at the job site for conformity to species. Sod shall be checked for visible broadleaf weeds, and a visible consistency with no obvious patches of foreign grasses that exceed 2 percent of the canopy. Sod that is heating up, dry, moldy, yellow, irregularly shaped, torn, or of uneven thickness shall be rejected. Other materials shall be inspected for compliance with specified requirements. Open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts, shall be rejected. Unacceptable materials shall be removed from the job site.

1.4.3 Storage

1.4.3.1 Sod

Sod shall be stored in designated areas and kept in a moist condition by watering with a fine mist, and covered with moist burlap, straw, or other covering. Covering shall allow air to circulate, preventing internal heat from building up. Sod shall be protected from exposure to wind and direct sunlight until installed.

1.4.3.2 Other Material Storage

Materials shall be stored in designated areas. Lime and fertilizer shall be stored in cool, dry locations, away from contaminants. Chemical treatment material shall be stored according to manufacturer's instructions and not with sod operation materials.

1.4.4 Handling

Sod shall not be damaged during handling. Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

1.4.5 Time Limitation

Time limitation between harvesting and installing sod shall be a maximum 36 hours.

PART 2 PRODUCTS

2.1 SOD

2.1.1 Sod Classification

State-certified sod shall be provided as classified by applicable state laws. Sod section shall be sized to permit rolling and lifting without breaking.

2.1.2 Grass Species

Grass species shall be Kentucky Bluegrass blend or Kentucky Bluegrass-Fescue blend, inspected and certified by the New Jersey Department of Agriculture.

2.1.3 Quality

Sod shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds or undesirable plants, stones larger than 1 inch in diameter, woody plant roots, and other materials detrimental to a healthy stand of grass plants. Broadleaf weeds and patches of foreign grasses shall be a maximum 2 percent of the sod section.

2.1.4 Thickness

Sod shall be machine cut to a minimum 1-3/8 inch thickness. Measurement for thickness shall exclude top growth and thatch.

2.1.5 Anchors

Sod anchors shall be as recommended by the sod supplier.

2.1.6 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

2.2 TOPSOIL

Topsoil shall be as defined in ASTM D 5268. When available, the topsoil shall be the existing surface soil stripped and staged onsite in accordance with Section 02111 EARTHWORK AND HANDLING OF CONTAMINATED MATERIAL. When additional topsoil is required beyond the available topsoil from stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the sod species specified. Topsoil shall be free from slag, cinders, stones, lumps of soil, sticks, roots, trash, or other material over a maximum 1-1/2 inch diameter. Topsoil shall be free from viable plants and plant parts.

2.3 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, organic material, and soil conditioners meeting the following requirements. Vermiculite

shall not be used.

2.3.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.3.1.1 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.3.1.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: A minimum 100 percent shall pass through a No. 8 sieve and a minimum 97 percent shall pass through a No. 60 sieve.

2.3.1.3 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 35 percent shall pass through a No. 60 sieve.

2.3.2 Fertilizer

The nutrients ratio shall be 5 percent nitrogen, 10 percent phosphorus, and 10 percent potassium. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea (IBDU). Fertilizer shall be balanced with the inclusion of trace minerals and micro-nutrients.

2.3.3 Nitrogen Carrier Fertilizer

Not Applicable

2.3.4 Organic Material

Organic material shall consist of either bonemeal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.3.4.1 Bonemeal

Bonemeal shall be finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.3.4.2 Rotted Manure

Rotted manure shall be unleached horse, chicken or cattle manure containing a maximum 25 percent by volume straw, sawdust, or other bedding materials. Manure shall contain no chemicals or ingredients harmful to plants. The manure shall be heat treated to kill weed seeds and be free of stones, sticks, and soil.

2.3.4.3 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, yard trimmings, or other wood waste material free of stones, sticks, soil, and toxic substances harmful to plants, fully composted or stabilized with nitrogen.

2.3.4.4 Recycled Compost

Compost shall be a well decomposed, stable, weed free organic matter source. Compost shall be derived from food; agricultural or industrial residuals; biosolids (treated sewage sludge); yard trimmings; or source-separated or mixed solid waste. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8 inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35-55 percent by weight. The material shall not contain more than 1 percent or less by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length.

2.3.4.5 Worm Castings

Worm castings shall be screened from worms and food source, and shall be commercially packaged.

2.3.5 Soil Conditioner

Soil conditioner shall be sand, super absorbent polymers, calcined clay, or gypsum for use singly or in combination to meet the requirements for topsoil.

2.3.5.1 Sand

Sand shall be clean and free of toxic materials. Gradation: A minimum 95 percent by weight shall pass a No. 10 sieve and a minimum 10 percent by weight shall pass a No. 16 sieve. Greensand shall be balanced with the inclusion of trace minerals and nutrients.

2.3.5.2 Super Absorbent Polymers

To improve water retention in soils, super absorbent polymers shall be sized and applied according to the manufacturer's recommendations. Polymers shall be added as a soil amendment and be cross-linked polyacrylamide with an absorption capacity of 250-400 times its weight.

2.3.5.3 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to minimum temperature of 1200 degrees F. Gradation: A minimum 90 percent passing No. 8 sieve; a minimum 99 percent shall be retained on a No. 60 sieve; and a maximum 2 percent shall pass a No. 100 sieve. Bulk density: A maximum 40 pounds per cubic foot.

2.3.5.4 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum 95 percent calcium sulfate by volume.

2.3.5.5 Expanded Shale, Clay, or Slate (ESCS)

Rotary kiln produced ESCS material shall be in conformance with ASTM D 5883.

2.4 WATER

Water shall be the responsibility of the Contractor unless otherwise noted.
Water shall not contain elements toxic to plant life.

2.5 PESTICIDE

Pesticide shall be insecticide, herbicide, fungicide, nematocide, rodenticide or miticide. For the purpose of this specification, a soil fumigant shall have the same requirements as a pesticide. The pesticide material shall be EPA registered and approved.

PART 3 EXECUTION

3.1 INSTALLING SOD TIME AND CONDITIONS

3.1.1 Sodding Time

Sod shall be installed from March 15 to October 31.

3.1.2 Sodding Conditions

Sodding 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 sodding operations, proposed alternate times shall be submitted for approval.

3.1.3 Soil Test

Delivered topsoil, existing soil in smooth graded areas, and stockpiled topsoil shall be tested in accordance with ASTM D 5268 and ASTM D 4972 for determining the particle size, pH, organic matter content, textural class, chemical analysis, soluble salts analysis, and mechanical analysis. Sample collection on site shall be random over the entire site. Sample collection for stockpiled topsoil shall be at different levels in the stockpile. The soil shall be free from debris, noxious weeds, toxic substances, or other materials harmful to plant growth. The test shall determine the quantities and type of soil amendments required to meet local growing conditions for the sod species specified.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

Prior to the commencement of the sodding operation, the Contractor shall verify that finished grades are as indicated on drawings; the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 02111 EARTHWORK AND HANDLING OF CONTAMINATED MATERIALS.

3.2.2 Application of Soil Amendments

3.2.2.1 Applying pH Adjuster

The application rate shall be 135 pounds per 1000 square feet. The pH adjuster shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage operation.

3.2.2.2 Applying Fertilizer

The application rate shall be 11 pounds per 1000 square feet. Fertilizer shall be incorporated into the soil to a maximum 4 inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.3 Applying Soil Conditioner

The soil conditioner shall be as recommended by the soil test. The soil conditioner shall be spread uniformly over the soil a minimum 1 inch depth and thoroughly incorporated by tillage into the soil to a maximum 4 inches depth.

3.2.2.4 Applying Super Absorbent Polymers

Polymers shall be spread uniformly over the soil as recommended by the manufacturer and thoroughly incorporated by tillage into the soil to a maximum 2 inches deep prior to placement of sod.

3.2.3 Tillage

Soil on slopes up to a maximum 3-horizontal-to-1-vertical shall be tilled to a minimum 4 inches deep. On slopes between 3-horizontal-to-1-vertical and 1-horizontal-to-1 vertical, the soil shall be tilled to a minimum 2 inches deep 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. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. The pH adjuster, fertilizer, and soil conditioner may be applied during this procedure.

3.2.4 Prepared Surface

3.2.4.1 Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be rolled and completed with a light raking to remove from the surface debris and stones over a minimum 5/8 inch in any dimension.

3.2.4.2 Protection

Areas within the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 INSTALLATION

Prior to installing sod, any previously prepared surface compacted or damaged shall be reworked to meet the requirements of paragraph SITE PREPARATION. 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 maximum 1 inch depth.

3.3.1 Installing Sod

Rows of sod sections shall be placed parallel to and tightly against each other. Joints shall be staggered laterally. The sod sections shall not be stretched or overlapped. All joints shall be butted tight. Voids and air drying of roots shall be prevented. Sod sections shall be laid across the slope on long slopes. Sod sections shall be laid at right angles to the flow of water in ditches. Sod sections shall be anchored on slopes steeper than 3-horizontal-to-1-vertical. Anchoring may be required when surface weight or pressure upon placed sod sections is anticipated to cause lateral movement. Sod anchors shall be placed a minimum 2 feet on center with a minimum 2 anchors per sod section.

3.3.2 Finishing

Displacement of the sod shall be prevented by tamping or rolling the sod in place and knitting the sod to the soil. Air pockets shall be eliminated and a true and even surface shall be provided. Frayed edges shall be trimmed, and holes or missing corners shall be patched with sod.

3.3.3 Watering Sod

Watering shall be started immediately after completing each day of installing sod. Water shall be applied at least 3 times per week to supplement rainfall, at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or plant material shall be prevented.

3.4 APPLICATION OF PESTICIDE

When application of a pesticide becomes necessary to remove a pest or disease, a pesticide treatment plan shall be submitted and coordinated with the installation pest management program.

3.4.1 Technical Representative

The certified installation pest management coordinator shall be the technical representative, and shall be present at all meetings concerning treatment measures for pest or disease control. They may be present during treatment application.

3.4.2 Application

A state certified applicator shall apply required pesticides in accordance with EPA label restrictions and recommendations. Clothing and personal protective equipment shall be used as specified on the pesticide label. A closed system is recommended as it prevents the pesticide from coming into contact with the applicator or other persons. Water for formulating shall only come from designated locations. Filling hoses shall be fitted with a backflow preventer meeting local plumbing codes or standards. Overflow shall be prevented during the filling operation. Prior to each day of use, the equipment used for applying pesticide shall be inspected for leaks, clogging, wear, or damage. Any repairs are to be performed immediately.

3.5 RESTORATION AND CLEAN UP

3.5.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the sodding operation shall be restored to original condition at Contractor's expense.

3.5.2 Clean Up

Excess and waste material shall be removed from the sodded areas and shall be disposed offsite. Adjacent paved areas shall be cleaned.

3.6 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the sodding operation in an area, the area shall be protected against traffic or other use by erecting barricades and/or providing signage as required, or as directed.

3.7 SOD ESTABLISHMENT PERIOD

3.7.1 Commencement

The sod establishment period to obtain a healthy stand of grass plants shall begin on the first day of work under this contract and shall end 3 months after the last day of sodding operation. Written calendar time period shall be furnished for the sod establishment period. When there is more than 1 sod establishment period, the boundaries of the sodded area covered for each period shall be described. The sod establishment period should be coordinated with Section 02921 SEEDING. The sod establishment period shall be modified for inclement weather, shut down periods, or for separate completion dates of areas.

3.7.2 Satisfactory Stand of Grass Plants

Grass plants shall be evaluated for species and health. A satisfactory stand of grass plants from the sodding operation shall be living sod uniform in color and leaf texture. Bare spots shall be a maximum 2 inch square. Joints between sod pieces shall be tight and free from weeds and other undesirable growth.

3.7.3 Maintenance During Establishment Period

Maintenance of the sodded areas shall include eradicating weeds, insects and diseases; protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; mowing; watering; and post-fertilization.

3.7.3.1 Mowing

Sodded areas shall be mowed to a minimum 3 inch height when the turf is a maximum 4 inch height. Clippings shall be removed when the amount cut prevents sunlight from reaching the ground surface.

3.7.3.2 Post-Fertilization

A maximum 1/2 pound per 1000 square feet of actual available nitrogen shall be provided to the grass plants. The application shall be timed prior to the advent of winter dormancy and shall be made without burning

the installed grass plants.

3.7.3.3 Pesticide Treatment

Treatment for disease or pest shall be in accordance with paragraph APPLICATION OF PESTICIDE.

3.7.3.4 Repair

Unsatisfactory stand of grass plants shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with paragraph SITE PREPARATION.

3.7.3.5 Maintenance Record

A record of each site visit shall be furnished which describes the maintenance work performed; areas repaired or reinstalled; and diagnosis for unsatisfactory stand of grass plants.

-- End of Section --

APPENDIX B

PRE-MOBILIZATION CHECKLIST

Answer each question by checking the appropriate column (yes, no, or NA). If “No” or “N/A” is checked, an explanation should be provided in the space marked **Exp**: This checklist is to be completed by the Inspector and randomly verified by the CQR. Attach a copy of all supporting documents (i.e. permits, training certificates, letters of correspondence, purchase orders, etc.) once the Checklist is complete.

CLUSTER NO. _____ PROPERTY ID: _____ STARTING DATE: _____

INSPECTOR/FIELD ENGINEER: _____

Permits:

	<u>Yes</u>	<u>No</u>	<u>NA</u>	<u>Initials</u>
Have the following permits been obtained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Stream Encroachment Permit (NJAC 7:13)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Soil Movement Permit Ordinance No. 91-05	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
POTW Discharge Permit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Soil Erosion and Sediment Control (NJAC 2:90)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Notifications/Site Access:

Have the following been notified of the starting date and expected duration of the proposed work?				
Notification to Property Owner:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Notification to NJDOT:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has the Right-of-Entry been received from the Property Owner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has the Notice to Proceed been received from USACE?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Submittals for Approval:

Has the submittal register been reviewed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has the applicable submittals been approved?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has the Construction Work Plan been approved by USACE per the approved submittal register?				

Site Preparation:

Have all the utilities been identified on the design drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has ‘One Call’ identified all the subsurface utilities? # _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Has a photographic documentation been completed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have survey controls been established on the Property by a licensed land surveyor? (pre-construction survey)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have the Final Status Survey Units been established and the grids delineated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have sampling efforts for Class 2 survey units been coordinated and scheduled to be implemented before construction commences?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Are all health and safety equipment/supplies ordered, prepared and ready for mobilization?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Subcontracts:

Have the following subcontracts been set-up in accordance with contract specifications (i.e. licensed to operate in New Jersey, USACE certification requirements, proof of insurance, etc.)? Attach supporting documents.				
Final Status Survey technical support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Off-site Laboratories for all soil and water testing (chemical, geotechnical, and radiological)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

PRE-MOBILIZATION CHECKLIST

Field Density and Conformance Testing of Backfill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Radiological environmental monitoring support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Procurement:

Have the purchase orders been processed for the following items? (attach copies of PO's)

All subcontracts listed above?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Borrow Source Material (common fill, structural fill, topsoil)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Construction traffic controls/Police and site safety signage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Materials (i.e. chain link fence, silt fence, hay bales, PPE, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Training:

Verify that all personnel scheduled to work on the property have appropriate up-to-date training? (attach copies of certificates)

40-Hour Hazwoper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Radiological training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Site Orientation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Construction Superintendent/Field Engineer

Date

MOBILIZATION CHECKLIST

Answer each question by checking the appropriate column (yes, no, or NA). If “No” or “N/A” is checked, an explanation should be provided in the space marked Exp: This checklist is to be completed by the Inspector and randomly verified by the CQR. Attach a copy of all supporting documents (i.e. permits, training certificates, letters of correspondence, purchase orders, etc.) once the Checklist is complete.

CLUSTER NO. _____ PROPERTY ID: _____ START DATE: _____
 INSPECTOR/FIELD ENGINEER: _____

Site Preparation:

	<u>Yes</u>	<u>No</u>	<u>NA</u>	<u>Initials</u>
Are temporary facilities in-place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Male/Female Sanitation Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Office/Craft break and change trailer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Health and Safety access control points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Is the appropriate signage place throughout the site in accordance with the SSHP?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Is Site Security established?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Are work zones established?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have erosion and sedimentation control measures been implemented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Are construction access points and access roads in-place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Are surface water management controls installed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Is clearing and grubbing of the area complete?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Have all sample points outside the limits of excavation been sampled for final status survey?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Mobilization:

Is all the equipment necessary to begin work on-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Are key personnel on site and have they had a properly specific Health and Safety Briefing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

 Construction Superintendent/Field Engineer

 Date

APPENDIX C

September 28, 2001

Allen Roos
Project Manager
U.S. Army Corps of Engineers
New York District - CENAN-PP
26 Federal Plaza - Room 2108
New York, NY 10278-0090

Dear Mr. Roos:

Re: EPA Review of Comments on the *Draft Water Management Work Plan*, August 2001, *Draft Master Construction Work Plan*, August 2001, and the *Draft Design Analysis Report: Cluster 1*, August 2001 - Maywood Chemical Site

The Environmental Protection Agency (EPA) has reviewed the above-referenced documents prepared by Stone and Webster on behalf of the U.S. Army Corps of Engineers for the Maywood Chemical Site. Our comments on the documents are listed below:

1. The Draft Master Construction Work Plan (page 4-2) indicates that monitoring wells will be sealed and filled in accordance with New Jersey regulations. The document does not detail why and which wells will be sealed and if they will be replaced after excavation activities. More information is necessary.
2. The Draft Master Construction Work Plan (page 4-4) indicates that "Only potable water obtained from a public water supply will be used for dust control." This appears to be inconsistent with the Draft Water Management Plan which indicates that *impacted water* will be "collected, pretreated and either used for dust control..."
3. The Draft Design Analysis Report (page 1-3) indicates that a UST is suspected to exist on Cluster No. 1. Based on the drawings provided with the document, the UST is not within a planned excavation area. However, if piping associated with the UST system is encountered during excavation, the system may need to be properly abandoned or removed in accordance with New Jersey regulations.

4. Parameters that the treated water from dewatering operations will be analyzed for are not outlined in the Draft Water Management Plan. This information needs to be specified in the document, including analyses planned at each stage of the treatment process. Analyses should include VOCs in locations near areas of groundwater contamination at the Stepan/Maywood and MISS properties or in other areas of suspected groundwater contamination (i.e., near USTs) and pH after any pH adjustment process. If it is suspected that dewatering activities have caused the movement of groundwater plumes, monitoring wells may be necessary to assess the impact.

At the present time EPA has limited phone service, if you have any questions on these comments please contact me by e-mail at carpenter.angela@epa.gov

Sincerely,

Angela Carpenter, Project Manager
Federal Facilities Section

cc: D. Gaffigan, NJDEP
B. Morse, FFS



State of New Jersey

Department of Environmental Protection

DONALD T. DIFRANCESCO
Acting Governor

Robert C. Shinn, Jr.
Commissioner

Allen D. Roos, Project Manager
U.S. Army Corps of Engineers
100 West Hunter Avenue
Maywood, NJ 07607

SEP 24 2001

Re: Maywood Chemical Superfund Site
Draft Master Construction Work Plan

Dear Mr. Roos:

The New Jersey Department of Environmental Protection (NJDEP) is in receipt of the Draft Master Construction Work Plan (Revision 1) dated August 2001.

Upon review, NJDEP finds the document to be acceptable.

If you have any questions regarding this letter, you may contact me at (609) 633-1494.

Sincerely,

Donna L. Gaffigan, Case Manager
Bureau of Case Management

C: Jenny Goodman, BER
Greg Rapp, BGWPA
Angela Carpenter, USEPA

Regulatory Agency: USEPA

Status: USACE/S&W Review

Date Received: 9/28/01

Date of Comment Review: 10/16/01

Draft Water Management Work Plan, Draft Master Construction Work Plan, and Draft Design Analysis Report, Cluster 1

No.	Comment	Discussion	Resolution
1.	<p>The Draft Master Construction Work Plan (page 4-2) indicates that monitoring wells will be sealed and filled in accordance with New Jersey regulations. The document does not detail why and which wells will be sealed and if they will be replaced after excavation activities.</p>	<p>The Master Construction Work Plan contemplates that existing monitoring wells might be disturbed during construction. If it is not possible to protect the integrity of the well during construction, the plan is to abandon the well in accordance with New Jersey regulations. Which wells might be impacted or need to be replaced is a site specific design detail that is addressed in each Cluster Design and would be addressed in the Cluster-specific Addendum to the Master Construction Work Plan.</p>	<p>Monitoring wells that need to be abandoned and replaced due to construction activities will be addressed in the Cluster-specific design and Master Construction Work Plan.</p> <p>If excavation depth at the monitoring well is greater than 2-feet deep, the monitoring well will be abandoned prior to excavation in accordance with NJ regulations. If it is needed for groundwater quality monitoring, a replacement well will be installed after completion of the removal/remedial action.</p> <p>If monitoring well falls outside the excavation or the excavation is less than 2-feet at the monitoring well, it will be protected during construction activities.</p> <p>If a monitoring well becomes damaged at any</p>

			time during construction it will be repaired if possible, or if not, abandoned in accordance with NJ regulations. If it is needed for groundwater quality monitoring, a replacement well will be installed after completion of the removal/remedial action.
2.	The Draft Master Construction Work Plan (page 4-4) indicates that "Only potable water obtained from a public water supply will be used for dust control." This appears to be inconsistent with the Draft Water Management Plan which indicates that <i>impacted water</i> will be "collected, pretreated and either used for dust control..."	The Draft Master Construction Work Plan is correct that only potable water will be used for dust control. There is no intent to transport treated water back to the vicinity property for use in dust control. In addition, based on a comment from the NJDEP, the Project does not wish to pursue a "Discharge to Groundwater Permit" at this time. Impacted water will only be pretreated and discharged to the local POTW.	No change to the Master Construction Work Plan is required. The Draft Water Management Plan, section 1.5.2 will be changed to reflect that only potable water will be used for dust control. Treated water will be discharged to the local POTW.
3.	The Draft Design Analysis Report (page 1-3) indicates that a UST is suspected to exist on Cluster No. 1. Based on the drawings provided with the document, the UST is not within a planned excavation area. However, if piping associated with the UST system is encountered during excavation, the system may need to be properly abandoned or removed in accordance with New Jersey regulations.	The UST is not within the excavation, and it is not known if any piping extends into the proposed excavation area. However, if piping is encountered during excavation, the system will be abandoned or removed in accordance with N.J.A.C. 7:26E-6.3 and N.J.A.C. 7:14B.	No resolution is currently required other than to acknowledge that underground piping if encountered will be handled in accordance with NJAC 7:26E-6.3 and NJAC 7:14B.
4.	Parameters that the treated water from dewatering operations will be analyzed for are not outlined in the Draft Water Management Plan. This information needs to be specified in the document, including analyses planned at each stage of the treatment process. Analyses should include VOCs in locations near areas of groundwater contamination at the Stepan/Maywood and MISS properties or in other	As stated in the Draft Water Management Plan, the pretreatment requirements for discharge to the BCUA POTW will be provided by both the NJDEP and BCUA. Parameters to be analyzed will be those specified by the BCUA and DEP. Conceptual sampling points are shown on Figure 3 of the Draft Water Management Plan however a final design has not yet been selected. Further, pH will likely be analyzed	No change to the Water Management Plan required. The POTW wastewater discharge permit will define sampling parameters. A permit application has been filed with Bergen

	<p>areas of suspected groundwater contamination (i.e., near USTs) and pH after any pH adjustment process. If it is suspected that dewatering activities have caused the movement of groundwater plumes, monitoring wells may be necessary to assess the impact.</p>	<p>since BCUA will include it in the discharge permit.</p> <p>Since the excavations are relatively shallow, only the surficial groundwater table is affected and only for a short period of time. No wells are used for deep dewatering, so there does not appear to be a potential for pulling in a contaminated plume during dewatering. Existing wells can be used for monitoring if necessary.</p>	<p>County Utilities Authority (BCUA) and the New Jersey Department of Environmental Protection (NJDEP) for discharge to a POTW. Once issued, the permit will be made part of the plan and a copy will be provided to the USEPA and NJDEP.</p> <p>The water treatment plant design has not been completed, therefore the analyses required for process control have not yet been established. We anticipate that VOCs and pH will be discharge parameters requiring analyses since they are included in BCUA's local standard.</p> <p>Construction dewatering activities are associated with shallow excavations and will impact the shallow groundwater table for a short period of time at each removal location. Dewatering will take place with excavated dewatering</p>
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			<p>sumps. Wells are not proposed for dewatering and therefore groundwater impact will be small to negligible.</p> <p>Existing monitoring wells on the vicinity properties may be used to assess impacts if a plume movement is suspected.</p>
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