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REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62472-94-D-0398  
DELIVERY ORDER NO. 0034  
FOSTER WHEELER ENVIRONMENTAL CORPORATION**

**WORK PLAN**

**FOR**

**LANDFILL CAPS FOR SITE 4 AND SITE 5  
AT  
NAVAL WEAPONS STATION EARLE**

**COLTS NECK, NEW JERSEY**

**DECEMBER 1997**

**Prepared for**

**U.S. Navy Northern Division**

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Attachment 4	Site Maps - Figures 1 and 2
Attachment 5	Site Layout Plans- Figures 3, 4, and 5

## 1. INTRODUCTION

Foster Wheeler Environmental Corporation (FWENC) is pleased to submit this work plan to the Department of the Navy (Navy) in response to the Delivery Order 0034. This work plan describes the work that will be performed to cap the Site 4 and 5 Landfills and to accomplish related tasks at the Naval Weapons Station Earle. Work described includes mobilization, site preparation, Skeet Range demolition and reconstruction, cap construction, wetlands restoration, site restoration and demobilization.

### 1.1 PROJECT BACKGROUND

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248-acre Main Base (Mainside) area, located inland, and the 706-acre Waterfront area. See the Site Vicinity Map, Figure 1 (Attachment 4). The two areas are connected by a Navy-controlled right-of-way. Commissioned in 1943, the facilities primary mission is to supply ammunition to the naval fleet.

Site 4 is a 3-acre landfill that received approximately 10,200 tons of mixed domestic and industrial wastes from 1943 until 1960. Materials disposed of in the landfill include metal scrap, construction debris, pesticide and herbicide containers, paint residue, and rinse waters. It has been reported that containers of paint, paint thinners, varnishes, shellacs, acids, alcohols, caustics, and asbestos may have also been disposed of in the landfill. The landfilled materials are currently covered by a thin layer of sandy soil.

Site 5 is a 8-acre landfill that received approximately 6,600 tons of mixed domestic and industrial wastes between 1968 and 1978. Wastes included paper, glass, plastic, construction debris, pesticide and herbicide containers, containers of paint, paint thinners, varnishes, shellacs, acids, alcohols, caustics, and small amounts of asbestos. The landfilled materials are currently covered by a sand and vegetated soil layer ranging in depth from 1 to 3 feet. Approximately 2.5 acres of the site are used as a skeet shooting range. See the Project Location Map, Figure 2 (Attachment 4).

A series of remedial investigations were conducted to determine the nature and extent of contamination at Sites 4 and 5. The results of these investigations concluded that groundwater in the vicinity of each site was impacted by metals and organic compounds. A feasibility study was later conducted to determine potential remedial actions for the sites. The selected remedial actions were presented in the Proposed Plan for OU-1, dated March 1997. The Proposed Plan selected capping as the preferred remedial alternative, consistent with the EPA presumptive remedy for municipal landfills. The Record of Decision for OU-1, dated July 1997, selected capping as the remedial action for Sites 4 and 5.

### 1.2 OBJECTIVES

The objective of the remedial action is the capping of Site 4 and Site 5 Landfills to prevent the release of landfilled waste materials into the environment and to reduce rainwater infiltration and associated leachate generation in accordance with the Record of Decision for OU-1.

## 2. PROJECT MANAGEMENT

The Project Management Team will be responsible for all technical and administrative aspects of the remediation project. Technical responsibilities include completion of the required remediation and construction activities in accordance with the Technical Specifications and Construction Drawings and good engineering practices. Included among the team's administrative responsibilities are project communications, project controls and scheduling, document control, and project meetings.

### 2.1 PROJECT TEAM ORGANIZATION

The project organization chart is included in Attachment 1. The following personnel are considered to be key team members for the performance of this project:

Supervising Project Engineering Manager, C. Tippman: The responsibility of the Project Manager is general oversight of all facets of the project. He will be responsible for the oversight, resource allocation, scheduling and quality control of the Project. He reports to the Program Manager and is the first point of contact for the Contracting Officer's Technical Representative (COTR) and the Design Navy Technical Representative (NTR).

Project Superintendent, D. Sullivan: The Superintendent will be responsible for all on site construction activities including supervision of craft labor and subcontractors and control of materials and equipment. The Project Superintendent reports directly to the Project Manager and Design NTR and interfaces with the Project Engineers and Quality Control Representative on a daily basis to ensure that quality control standards are being met.

Craft Supervisor, J. Carroll:

The Craft Supervisor will be responsible for construction activities in the absence of the project superintendent and will supervise craft labor and subcontractors. The Craft Supervisor reports directly to the Project Superintendent and interfaces with the Project Engineer and Quality Control Representative.

Project Engineer, L. Stewart: The responsibility of the Project Engineer is to provide guidance to the field construction staff relating to compliance with the contract plans and specifications and to prepare technical plans and submittals. The Project Engineer reports directly to the Project Superintendent.

Project Procurement Engineer, E. Federico: The Project Procurement Engineer is responsible for procurement of materials and equipment and reports directly to the Project Superintendent.

Project Controls Engineer, M. Pagano: The Project Controls Engineer is responsible for project controls, including scheduling, invoicing, and financial reporting and reports directly to the Project Superintendent.

Health and Safety Manager, G. Coppi: The Health and Safety Manager (HSM) is responsible for oversight of the health and safety procedures used on this project. He will consult with, and give direction to, the Site Health and Safety Officer.

Site Health and Safety Officer, J. Carroll: The Site Health and Safety Officer (SHSO) will be responsible for the overall health and safety of all employees on site. The SHSO will be responsible for daily health and safety monitoring, implementation of all health and safety procedures and requirements, and maintenance of health and safety records. The SHSO will have the authority to shut-down any operation that is deemed by him to be unsafe. He will report to the HSM and will interface closely with the Site Superintendent.

Task Health and Safety Officer, TBD: The task HSO will be responsible for health and safety of construction forces during subgrade preparation/ landfill waste material handling. He will be responsible for ordnance materials safety and coordination of ordnance materials related work with Navy Explosive Ordnance Disposal personnel. He will report to the SHSO and interface with the Site Superintendent.

Quality Control Manager, A. Aziz: The Quality Control Manager (QCM) is responsible for approval and oversight of quality control activities and procedures used on the project. He will provide direction to the site quality control representative.

Quality Control Representative, M. Miller: The Quality Control Representative will be responsible for performing inspection and surveillance activities and for documenting results of these activities as required to achieve the quality of construction required by the technical specifications and drawings. He will report to the program QC manager and will interface with the project engineer and superintendent.

## 2.2 PROJECT COMMUNICATION

Lines of communication between FWENC and other Project Team members are shown in the Project Organization Chart in Attachment 1. Communication between Naval Weapons Station Earle Security, Public Works, Explosive Ordnance Disposal, Environmental, and other departments will be through the construction NTR in the office of the Resident Officer in Charge of Construction.

## 2.3 PROJECT SCHEDULE

The Construction Schedule is included in Attachment 2.

## 2.4 DOCUMENT CONTROL

Quality control records, test reports, submittals and approvals, record drawings, changes to the contract, updated construction schedules, invoices, daily reports, and all other project record documents, as required, will be maintained in the project files. The files will be located in the site office and will be available for review by the Navy.

A Submittal Register which summarizes the submittal requirements of the specifications is included in Attachment 3. Submittals processing is described in the Project Quality Control Plan.

Technical changes to the work identified by FWENC, technical questions concerning drawings and specifications, and reporting of non-conforming items will be documented by the submittal of Change Requests Forms, Requests For Information and Non-Conformance Reports to the

Navy for disposition. These documents will be maintained in the project files. Formats that will be used for these reports and the daily reports are included in the CQC Plan.

## 2.5 PROJECT MEETINGS

### Pre-construction

Before any physical work begins on the site, the FWENC project staff and the Navy and their representatives will meet to discuss coordination of the project. Items to be discussed in this meeting will include access to the site, working hours, specific health and safety issues and general scheduling of the work.

### Weekly QC/ Progress Meeting

QC/Progress Meetings will be conducted once a week. The meetings will be held at the FWENC field offices or as otherwise requested by the Navy.

### 3. DESCRIPTION OF ACTIVITIES

#### 3.1 ANTICIPATED TASKS

FWENC has reviewed the Technical Specifications, Drawings, and Statement of Services and has determined that the following major activities, not necessarily in the order listed, will be performed:

##### SITE 4

- Perform surveying.
- Install sedimentation and erosion control measures: silt fence, drainage channels, berms, and basins.
- Perform clearing and grubbing.
- Construct stabilized construction entrance.
- Perform preliminary construction activities including abandonment of existing water line.
- Construct cap access ramp.
- Perform subgrade preparation activities, including excavation of waste outside the limits of regraded waste and incorporation of the waste into the landfill.
- Provide and install riprap.
- Provide and install geosynthetic soil cap components. Specific layers include: drainage layer; bedding/gas management layer; very flexible polyethylene (VFPE) geomembrane; woven and non-woven geotextiles; select fill; topsoil; and turf.
- Regrade sediment basins.
- Restore wetlands area, which includes waste excavation, regrading, and establishing trees, shrubs, and grass.
- Revegetate all disturbed areas.
- Perform site cleanup. Demobilize resources.

##### SITE 5

- Perform surveying.
- Install sedimentation and erosion control measures: silt fence, drainage channels, basins.
- Perform clearing and grubbing.
- Construct stabilized construction entrances.
- Perform preliminary construction activities which include: removal of skeet range structures and utilities; abandonment/modification of monitoring wells.
- Construct cap access ramps and culverts.

- Perform subgrade preparation activities, including excavation of waste outside the limits of regraded waste and incorporation of the waste into the landfill.
- Provide and install riprap.
- Provide and install geosynthetic soil cap components. Specific layers include: drainage layer; bedding/gas management layer; very flexible polyethylene (VFPE) geomembrane; woven and non-woven geotextiles; select fill; topsoil; and turf; base course; and bituminous concrete or aggregate surface course.
- Construct Skeet Range aggregate access road and parking lot.
- Install skeet range facilities and utilities, including sewage system, electric power and telephone.
- Revegetate all disturbed areas.
- Perform site cleanup. Demobilize resources.

### 3.2 MANPOWER REQUIREMENTS

FWENC estimates that the following union craft labor will be required for the proposed activities:

- General Operations
 

Operating Engineers -	10
Laborers -	8
Teamsters -	2
- Liner and Geotextile Installation
 

Operating Engineers -	1
Liner Technicians -	6
Laborers -	6

### 3.3 EQUIPMENT REQUIREMENTS

#### 3.3.1 Major Construction Equipment

Major construction equipment to be used on this project will include the following:

- Cat D-6 Bulldozer (3)
- Cat D-4H LGP Bulldozer (2)
- Cat D-5H LGP Bulldozer
- Smooth drum vibratory rollers (2)
- Cat 225 excavator

1,500 gallon water truck  
Cat IT-28 loader  
Volvo L-150 loader  
Volvo ADT-30 dump truck (2)  
Ditch Witch

The Project Superintendent will substitute/add equipment as required.

### 3.3.2 Radio Wave Emitting Equipment

Radio wave emitting equipment to be used on this project may include two-way radios, cell phones, surveying equipment, sampling equipment, and other similar devices. A list of this equipment with technical information (power and frequency) will be provided to the Navy for approval prior to use on site.

### 3.4 CONSTRUCTION QUALITY CONTROL

A Quality Control Plan has been prepared for this project. Construction quality control (CQC) will be performed by the QC Representative. He will be responsible for ensuring that construction conforms to the requirements of the technical specifications and the construction drawings, which includes: material testing, documentation of results, reporting results to the Project Superintendent, reporting deficiencies and certifying that all submittals are in compliance with contract requirements.

Quality control inspection and testing will be performed in accordance with the Technical Specifications and the Quality Control Plan. Testing encompasses geotechnical testing of soil materials; material testing of liners, seams, and other related cap components and general testing of materials to ensure compliance with the Technical Specifications. Testing will be conducted both on-site and off-site. Subcontracted testing laboratories will be utilized for testing of soils and cap components.

### 3.5 HEALTH AND SAFETY REQUIREMENTS

The site-specific Health and Safety Plan (HASP) provides requirements and guidelines that will be utilized in the field to protect the health and safety of workers. The SHSO will provide oversight of activities to ensure conformance with the HASP. The SHSO will supervise operations and be responsible for conducting site health and safety training/briefings, air and dust monitoring during operations, personnel monitoring, enforcing/modifying levels of PPE protection, ensuring compliance with decontamination procedures, maintaining monitoring equipment, and documenting and reporting all health and safety related accidents or injuries.

The SHSO will conduct site safety inspections. Weekly and monthly reports will be prepared and submitted to the Health and Safety Manager.

The following are specific components of the HASP that affect the daily activities of workers:

- A hazard assessment has been prepared for the major aspects of the project. Chemical, physical, and biological hazards associated with the project have been identified. Activity hazard analyses have been prepared to define the specific risks and means of mitigation that are associated with daily construction activities.
- Control measures to reduce the risk of exposure to chemical, physical, and biological hazards.
- Specific training requirements that will enable workers to operate at the site and improve their awareness of health and safety are presented in the HASP.
- Control of site operations, use of PPE, site safety equipment, and on-site communications.
- Real-time air monitoring and medical surveillance procedures are included in the HASP.
- Decontamination procedures, including contamination prevention, personnel decontamination, equipment decontamination, and disposal procedures, have been defined for site work.

### 3.6 PROCEDURES FOR DECONTAMINATION

This section describes the procedures necessary to ensure that both personnel and equipment are free from contamination. Detailed decontamination procedures are included in the HASP.

#### 3.6.1 Personnel Decontamination

The following site activities present an opportunity for personnel contamination:

- Clearing and grubbing.
- Excavation and placement of landfill waste material
- Decontamination of equipment.

FWENC will apply engineering and/or work practice controls as a means of protecting personnel in performance of site-specific tasks. Engineering controls will be implemented to reduce and maintain employee exposure below safe levels for those tasks that include possible exposure to contaminants. When engineering controls are impractical or insufficient to protect employees during site operations, FWENC will use personal protection equipment (PPE).

Any personnel exposed to possible contamination during daily activities will follow proper decontamination procedures. Decontamination procedures will ensure that material which workers may have contacted in the Exclusion Zone (EZ) does not result in personal exposure and is not spread to clean areas of the site. The EZs will be limited to the work areas that are considered or suspected to be contaminated, which will be revised and updated daily as waste material is exposed and subsequently covered with gas management layer/clean fill material.

### 3.6.2 Equipment Decontamination

All contaminated equipment will be decontaminated when switching from a contaminated task to a clean one and before leaving the site. Decontamination procedures may include sweeping, wiping or scraping the exterior of the equipment. Personnel performing this task will wear the proper PPE as specified in the HASP.

Decontamination solids will be placed within the “final limits of landfill material” while the subgrade is exposed and before clean landfill cap materials are installed.

#### 4. REMEDIAL CONSTRUCTION

This section provides a description of the major tasks that will be performed to accomplish the objectives of the remedial action. Tasks will be performed in accordance with the Construction Drawings and Technical Specifications prepared by Brown and Root Environmental, as listed below, unless noted, and in accordance with the site specific Health and Safety Plan.

##### CONSTRUCTION DRAWINGS DATED NOVEMBER 10, 1997

Drawing Revision No.	Disc. Drawing No.	Drawing Title
1	T-1	Title Sheet
1	T-2	Legend and General Notes
1	C-1	Erosion and Sediment Control Plan Notes
1	C-2	Erosion and Sediment Control Revegetation Notes
0	C-3	Existing Conditions Plan, Site 4
1	C-4	Erosion and Sediment Control Plan, Site 4
0	C-5	Excavation and Regrading Plan, Site 4
1	C-6	Final Grading Plan, Site 4
0	C-7	Cross Sections Site 4 (Sheet 1 of 2)
0	C-8	Cross Sections Site 4 (Sheet 2 of 2)
0	C-9	Wetlands Restoration Plan, Site 4
0	C-10	Existing Conditions and Demolition Plan, Site 5
1	C-11	Erosion and Sediment Control Plan, Site 5
0	C-12	Regrading Plan, Site 5
1	C-13	Final Grading Plan, Site 5
0	C-14	Cross Sections Site 5 (Sheet 1 of 2)
0	C-15	Cross Sections Site 5 (Sheet 2 of 2)
0	C-16	Relocation of Skeet Range Facilities, Site 5
1	C-17	Cover System Details, Site 4 and 5 (Sheet 1 of 2)
1	C-18	Cover System Details, Site 4 and 5 (Sheet 2 of 2)
1	C-19	Surface Water Management Details (Sheet 1 of 2)
1	C-20	Surface Water Management Details (Sheet 2 of 2)
0	C-21	Miscellaneous Details (Sheet 1 of 2)
0	C-22	Miscellaneous Details (Sheet 2 of 2)
0	E-1	Existing Electrical Conditions Plan, Site 5
0	E-2	Electrical Plan, Site 5
0	E-3	Electrical One Line Diagram, Site 5
0	E-4	Electrical Details, Site 5

NAVFAC Drawing No.	Disc. Drawing No.	Drawing Title
	C-21	Miscellaneous Details (Sheet 1 of 2)
	C-22	Miscellaneous Details (Sheet 2 of 2)
	E-1	Existing Electrical Conditions Plan, Site 5
	E-2	Electrical Plan, Site 5
	E-3	Electrical One Line Diagram, Site 5
	E-4	Electrical Details, Site 5

TECHNICAL SPECIFICATIONS DATED NOVEMBER 1997

Specification Section	Title
<b>DIVISION 02 SITE WORK</b>	
02142	Very Flexible Polyethylene Geomembrane (VFPE)
02143	Gas Management Piping
02220	Site Demolition
02231	Clearing and Grubbing
02272	Geotextiles
02315	Excavation and Fill
02524	Monitoring Wells
02530	Sanitary Sewerage
02582	Electrical Manhole and Handhole
02631	Storm Drainage
02741	Bituminous Concrete Pavement
02921	Turf
02951	Mitigated Wetlands Area, Shrubs, Plants, and Grass
<b>DIVISION 03 CONCRETE</b>	
03300	Cast-In-Place Concrete
<b>DIVISION 10 SPECIALTIES</b>	
10400	Identification Devices

Specification Section	Title
DIVISION 16 ELECTRICAL	
16050	Basic Electrical Materials and Methods
16301	Overhead Transmission and Distribution
16400	Service and Distribution
16403	Underground Electrical Work - Low Voltage
16524	Exterior Lighting

#### 4.1 MOBILIZATION

##### 4.1.1 Support Zone Construction and General Site Mobilization

Temporary construction offices and facilities, lay down, staging and material storage areas, stabilized construction entrances, access ramps, and haul roads will be installed. Pinebrook Road will be improved to allow access to the EOD range when the main access road is not usable because of Site 5 construction. Facilities will include an office trailer, a craft trailer at each site, two or more storage containers, and portable toilets. Utility connections will be completed for power, water, and communications. Arrangements will be made for mail delivery and solid waste and sewage disposal services. Administrative staff, craft labor and equipment will be mobilized to the site. See the Site Layout Plans, Attachment 5.

#### 4.2 SITE PREPARATION

##### 4.2.1 Erosion and Sediment Controls

The Erosion and Sediment Control Plan prepared for Sites 4 and 5 will be implemented in accordance with drawings C-1, C-2, C-4, C-11, C-19, and C-20 and associated Technical Specifications. Prior to site disturbance, the perimeter soil erosion and sediment control devices will be constructed. Channels and berms will be constructed to direct surface water to the sediment basins. Channels, berms and basins will be constructed immediately after the sites are cleared and grubbed. Following cap construction, vegetation/permanent stabilization will be established and the Site 4 sediment basins will be removed while Site 5 sediment basins will remain to be used as stormwater detention basins.

During construction, erosion and sediment control features will be inspected and maintained as required. During subgrade preparation, and finally, just before complete covering of the subgrade, sediment will be removed from silt fence and basins and incorporated into the landfill. After landfill waste is covered, sediments will be spread on the ground.

#### 4.2.2 Site Survey

An initial site survey will be performed to establish controls required to conduct construction surveys. The limits of disturbance, the drainage channels, and the limit of final cover system, as shown on the drawings, will be staked in the field.

#### 4.2.3 Demolition/Relocation

On Site 5, existing structures, facilities, utilities, paved areas, and other items associated with the existing Skeet Range, as shown on Drawing C-10, will be removed and disposed or stored in accordance with Specification Section 02220 and Drawing C-10. On Site 4, the existing water line identified on Drawing C-3 will be abandoned in place or, if required, a portion will be removed and incorporated into the landfill. Organic building debris and other material to be disposed will be disposed off site.

#### 4.2.4 Monitoring Wells

Existing monitoring wells identified on Drawing C-11 to be abandoned will be abandoned as described in Specification Section 02524. Existing monitoring wells to be modified, identified on Drawing C-11, will be modified as shown on Drawing C-21 by extending the casings to final grade.

#### 4.2.5 Clearing and Grubbing and Topsoil Removal

Clearing and grubbing will be performed in areas within the limits of disturbance in accordance with Specification Section 02231. Clearing and grubbing debris will be chipped and used as mulch for wetlands restoration or will be disposed off-site at an on-base location to be determined. Topsoil will be stripped from clean areas and stockpiled for later use.

#### 4.2.6 Wetlands Considerations

The Site 4 "limits of final cover system" encroach into the wetlands limits. However, restoration of an area that is currently part of the landfill to a wetland will result in a net increase in the wetlands area.

##### 4.2.6.1 Wetlands Protection

No construction work will be undertaken in the wetlands except as planned in Site 4. Silt fence will be installed between the cap construction limits of disturbance and the wetlands limits at Sites 4 and 5. A 50'-0" buffer zone will be maintained between wetlands and any area where hazardous materials and/or equipment are stored.

### 4.3 STORM DRAINAGE SYSTEM

Surface drainage for the landfill caps is provided by a system of channels and culverts, which are part of the erosion and sediment controls discussed in paragraph 4.2.1, above. Additional temporary culverts are required at haul road/drainage channel crossings and will be designed in the field and constructed of corrugated HDPE pipe.

Surface drainage should be provided during construction by installing the perimeter channels early in the construction phase, which will provide pathways for diverting stormwater to the basins and the temporary channel for discharge into the wetlands.

#### 4.4 FINAL COVER SYSTEM SUBGRADE PREPARATION

The final cover system subgrade will be constructed to design grade, as shown on the Drawings and in accordance with Specification Section 02220 and 02315. Landfill waste material is potentially contaminated and work will be conducted in accordance with the Health and Safety Plan.

##### 4.4.1 Landfill Waste Material Excavation

Within the "limits of regraded waste," landfill waste material will be cut and filled as required to achieve the subgrade as shown on Drawings C-5 and C-12. Landfill waste material extending laterally beyond these limits will be excavated and placed within the limits. It is not anticipated that dewatering or shoring will be required to accomplish the landfill cap construction or landfill waste material excavation.

Drawings C-5 and C-12 indicate areas where landfill waste material extends laterally beyond the "limits of regraded waste." Excavation will be performed to the visual limits of waste in the indicated areas. Removed landfill waste material will be incorporated into the landfill within the "limits of regraded waste." Select fill will be used to bring the subgrade to design grade.

##### 4.4.2 Ordnance Related Materials

Site personnel will be trained to recognize ordnance or suspected ordnance related materials. Ordnance materials will not be handled by FWENC site personnel. If suspected ordnance related materials are encountered, work will stop and personnel will evacuate the site. Navy Explosive Ordnance Disposal personnel will be contacted, who will be responsible for removal and disposal of ordnance materials.

##### 4.4.3 Wetlands Restoration

Excavation of landfill waste material will be performed in the wetlands on the west side of Site 4. Removal of waste will allow the area to be restored to a permanent wetlands area. Wetlands soil removed from adjacent areas during subgrade preparation will be used to construct the wetland area. Once landfill waste material is excavated and placed within the "limits of regraded waste," surface soil in the adjacent areas will be removed and used to backfill the excavation.

##### 4.4.4 Excess Landfill Material

Any excess landfill material resulting from cut and fill activities during subgrade preparation will remain on site and be incorporated into the subgrade, beneath the landfill cap.

#### 4.5 FINAL COVER SYSTEM

The final cover system comprises a bedding/gas management layer, a very flexible polyethylene (VFPE) geomembrane, a drainage layer, woven and non-woven geotextiles, riprap, a select fill layer and, depending upon the proposed use of the cap, either topsoil and turf or a base course and a bituminous concrete or aggregate surface course as shown on Drawing C-17 and Drawing C-18. Soil materials will be obtained from off-site sources. Selection of soil materials will be based on meeting the requirements of the material specifications and also on optimizing the structural performance of the soil layers in the landfill cap.

##### 4.5.1 Bedding/Gas Management Layer

Bedding/gas management layer material and construction will be in accordance with Specification Section 02315.

##### 4.5.2 VFPE Geomembrane

VFPE geomembrane material and installation (by FWENC labor) will be in accordance with Specification Section 02142.

##### 4.5.3 Drainage Layer

Drainage layer material and construction will be in accordance with Specification Section 02315.

##### 4.5.4 Woven and Non-Woven Geotextiles

Woven and non-woven geotextile material and installation will be in accordance with Specification Section 02772.

##### 4.5.5 Base Course and Aggregate Surface Course

Base course and aggregate surface course material and construction will be in accordance with Specification Section 02315.

##### 4.5.6 Bituminous Concrete Surface Course

Surface course material and construction will be in accordance with Specification Section 02741.

##### 4.5.7 Select Fill Layer

Select fill layer material and construction will be in accordance with Specification Section 02315.

##### 4.5.8 Riprap

Riprap will be used along the perimeter of the cap as shown on Drawings C-17 and C-18. Material and construction will be in accordance with Specification Section 02315.

#### 4.5.9 Topsoil and Turf

Topsoil layer material and construction and turf materials and installation will be in accordance with Specification Section 02921.

#### 4.6 GAS MANAGEMENT PIPING

Gas management piping and gas vents are located as shown on Drawings C-6 and C-13. Details of the gas vents are shown on Drawing C-21. Gas management piping and vents materials and construction will be in accordance with the Drawings and Specification Section 02143.

#### 4.7 WETLANDS RESTORATION

Wetlands to the west of, and adjacent to, the Site 4 cap will be impacted by cap construction. Landfill waste material will be excavated from an area that will be subsequently restored as a wetland. Wetland restoration will be in accordance with Drawing C-9 and Specification Section 02951.

#### 4.8 SKEET RANGE DEMOLITION AND CONSTRUCTION

##### 4.8.1 Utilities Demolition

Existing Skeet Range utilities, which include electric power telephone and a septic tank sanitary sewer system, will be either removed and disposed or abandoned in place (depending on field conditions) in accordance with Specification Section 02220 and Drawings C-10 and E-1. Demolition of the electrical system will be coordinated with the Navy to minimize power disruption.

##### 4.8.2 Facilities Demolition

Existing Skeet Range facilities, which include the clubhouse trailer, trailer contents, deck, high house, low house, trap house, clay launch houses, and flag pole will be either removed and disposed or removed and stored for reuse in accordance (depending on field conditions) with Specification Section 02220 and Drawing C-10.

##### 4.8.3 Utilities Construction

Electric power, telephone, and sanitary sewer systems will be constructed in accordance with Specification Sections 02530, 02582, 16050, 16301, 16400, 16403, and 16524, and Drawings C-16, C-22, E-1, E-2, E-3, and E-4.

##### 4.8.4 Facilities Construction/Reinstallation

Concrete foundations will be constructed for the new trailer, high house, low house, trap house, clay houses, and potable water and propane tanks as located and detailed on Drawings C-16 and C-22 and as specified in Specification Section 03300. Reinstallation of Skeet Range facilities will be coordinated with the Navy.

#### 4.9 SITE RESTORATION

Site restoration will consist of the removal of temporary constructed features, such as haul roads and staging and material lay-down areas, removal of temporary sedimentation and erosion control features, restoration of areas to their original or design conditions, general site clean-up, fine grading, and establishment of vegetation in areas that were disturbed by construction activities. Seeding will be done in accordance with Specification Section 02921 and Drawings C-1 and C-2. Site restoration work will primarily be completed following the completion of construction in an area and will be performed just prior to demobilization.

#### 4.10 DEMOBILIZATION

Following completion of construction activities, temporary facilities and utilities, personnel, equipment and materials will be removed from the site and the support zone area will be restored. Construction equipment will be decontaminated before leaving the site.

#### 4.11 SUBCONTRACTED WORK

The following tasks will be performed by FWENC Subcontractors:

- surveying
- electrical work
- off-site transportation and disposal
- geotechnical testing
- geomembrane laboratory testing
- clearing and grubbing
- paving
- cast-in-place concrete work
- seeding and planting

FWENC will self-perform all other work.

#### 4.12 DUST CONTROL

Dust control measures will be implemented during active construction on site. Water will be applied by the water truck to work areas, haul roads, and access roads as often as required to prevent excessive dust emissions.

## 5. FINAL REPORT

A final engineering report will be written and finalized within 30 days of project completion and furnished to the Navy. The 30 days will commence on the first day after the final inspection has been completed and the work is accepted by the Navy. The final engineering report will contain the following items:

- Summary of Record Documents
- Discussion of Remediation Activities Performed
- Record Drawings

## 6.0 REGULATORY COMPLIANCE

### 6.1 MONITORING WELL ABANDONMENT

Well abandonment procedures will conform to the State of NJ's well abandonment protocol as published in NJAC 7:26 E and EPA 600/4-89/034. A well abandonment permit is not required, however, the substantive requirements of the well abandonment regulations, including the submission of a NJDEP Well Abandonment Form and Report 6 will be followed for each well abandoned.

### 6.2 WETLANDS ACTIVITIES

The sedimentation basin at Site 4 will be constructed in the adjacent wetlands and will disturb approximately 0.4 acres of existing freshwater wetlands of intermediate resource value. Construction activities will comply with regulations promulgated under Section 404 of the Clean Water Act and the NJDEP Freshwater Wetlands Regulations (NJAC 7-74). NJDEP has been authorized by EPA to administer the federal wetlands program.

Construction of the sedimentation basin will be performed in accordance with the NJDEP Statewide General Permit #4 for construction activities in wetlands. Wetlands Mitigation will be performed in accordance with the procedures of NJAC 7:7A-14 for all disturbed areas. Restoration will be performed at ratio of one acre restored to one acre lost, modified, or disturbed to restore the site to pre-activity condition. If restoration has not been completed within 6 months of disturbance, then creation will be required at a ratio of 2 acres created to one acre lost or disturbed. All wetlands activities will be conducted as specified in Section 4.7 of the Work Plan, Section 4.1 and 4.11 of the "Environmental Permit Report for Remedial Action at OU-1", September 1997.

#### 6.2.1 Wetlands Transition Areas

The area within 50 feet of the intermediate resource value freshwater wetland in Site 4 is classified as a wetlands transition area. Activities including excavation, land disturbance, fueling, paving are normally prohibited unless the activities are being conducted under a Statewide General Permit transition area waiver. Activities under this project will be in accordance with the transition area waiver requirements under the Statewide General Permit as specified in Section 4.7 of the Work Plan and Section 4.12 of the "Environmental Conditions Report for Remedial Action OU-1," September 1997.

### 6.3 STORM WATER DISCHARGE

Construction activities at Site 4 will result in discharges of storm water run off into the adjacent wetland. Although no permits will be required for this activity, the activity must comply with the substantive requirements of the NJDEP Statewide General NJDPES Storm Water Permit #NJ0088323 for storm water discharges from construction activities that disturb 5 or more acres.

There are no specific effluent limitations or monitoring required for this discharge, however no discharges of hazardous substances, as defined in NJAC 7:1E-1.7, are permitted. The construction of the storm water outfall structures in the wetland shall comply with the substantive requirements of NJDEP Wetlands General Permit II. A sedimentation basin will be constructed to treat the storm water to minimize sediment and discharge to the wetland. All outfall structures shall be constructed in accordance with the Standards for "Soil Erosion and Sediment Control in New Jersey" and New Jersey DEP requirements specified in Section 411 of the Environmental Conditions Permit Report for Remedial Action at OU1, Sept 1997.

#### 6.4 SEPTIC TANK SYSTEM

An existing septic tank at Site 5 which serviced the clubhouse will be closed and abandoned in place. All waste water will be removed from the tank and disposed in the sanitary sewer system on site. The tank will be filled with clean soil and abandoned in place. A new waste water holding tank will be constructed in accordance with NJ DEPE requirements under NJ AG7:14 A023 as specified in Section 4.8.3 of the work plan.

#### 6.5 EARTH MOVING OPERATION

All excavation, grading and earth moving operation will be conducted in accordance with the "Standards for Soil Erosion Sediment Control in New Jersey," although a Soil Erosion Control Permit will not be required, a Soil Erosion and Sediment Control Plan has been prepared.

#### 6.6 LANDFILL CLOSURE AND CAP DESIGN

The landfills at Sites 4 and 5 were used for disposal of domestic solid waste, construction and demolition debris and small amounts of industrial waste. Landfill closure and cap design and construction are being conducted in accordance with NJDEP landfill engineering and design standards under NJAC 7:26-2A7, as specified in the design prepared by Brown & Root.

#### 6.7 WASTE MANAGEMENT

As per the "Environmental permits Report for Remedial Action at Operable Unit 1 (Sites 4 and 5)" Sept 1997, Brown & Root, RCRA Hazardous Wastes will not be generated during remedial activities, only solid wastes are expected to be generated.

Solid wastes generated on site will be managed in accordance with NJDEP Solid Waste Regulations published under 7:26, and the Record of Decision dated Sept 1997.

If RCRA hazardous wastes are encountered, they will be managed in accordance with RCRA requirements under 40CFR parts 260-268 and NJDEP requirements under 7:26G and this plan will be amended to include all applicable requirements for hazardous waste management.

The following waste materials will be generated during remedial activities.

- Excavated waste from landfill Sites 4 and 5.
- Wood and other construction and demolition debris generated during Skeet Range building demolition.

- Uncontaminated vegetative waste generated during cleaning and grubbing activities at Sites 4 and 5.
- PPE consisting of Tyvecs, booties, gloves, etc. from intrusive activities at Sites 4 and 5.
- Sanitary waste water from septic tank closure at Site 5.

All disposal facilities and transporters used for off-site disposal will be approved in accordance with FWENC Corporate Regulatory Compliance Procedure RC-2 and will be approved by the Navy prior to use. FWENC will prepare all waste documentation (profiles, Bills of Lading, manifests) for Navy review and signature. FWENC personnel will not sign one waste documentation unless approval is obtained from the FWENC Legal Department.

#### 6.7.1 Excavated Wastes - Sites 4 and 5

As per the ROD, all previously landfilled wastes previously landfilled at Sites 4 and 5 which are distributed during excavation and grading activities or which extends laterally beyond the "limits of regraded waste" will be placed back in the landfills within the limits of regraded waste." There will be no off-site disposal of landfill waste material.

If intact waste drums are encountered during excavation activities, they will be excavated and overpacked in DOT approved container and staged on-site pending further direction from the Navy. This will be considered a change in site conditions. Intact drums will not be crushed, emptied or otherwise disposed on-site.

#### 6.7.2 Construction and Demolition Debris.

Construction and demolition debris consisting of wood, concrete, metal and other building materials will be generated from clubhouse demolition at Site 5 and other site activities. This Construction and Demolition waste is expected to be non-hazardous as per the Project Specification and will be disposed off-site at a permitted Subtitle D Solid Waste Landfill. Off-site recycling is not considered to be feasible as the material must be source separated prior to shipment to permitted recycling facilities. Sampling and analysis of waste material if necessary will be conducted in accordance with disposal facility requirements.

#### 6.7.3 Vegetative waste.

Vegetative waste generated from above grade cleaning activities and grubbing waste generated from below grade activities on uncontaminated areas will be considered to be uncontaminated and will be shipped on-site and disposed at a Navy landfill on-site.

Vegetative waste generated from below grade grubbing operations in Sites 4 and 5 which may have been in contact with waste materials or contaminated solids will be shipped on-site and placed under the cap at Sites 4 and 5. If these materials cannot be placed under the cap, they will be segregated and stockpiled in a dual lined stockpiled area sampled and tested for RCRA characteristics (ignitability, corrosivity, reactivity, and toxicity). If determined to be non-hazardous they will be disposed at a Navy Landfill site with the other vegetative waste stream. If RCRA hazardous, the material will be disposed off-site at a permitted RCRA Subtitle C Facility.

#### 6.7.4 PPE

Tyvec, gloves and other PPE generated during intrusive work at Sites 4 and 5 may be contaminated with site wastes and will be placed under the cap at Sites 4 and 5.

#### 6.8 HAZARDOUS WASTE DISPOSAL

Each waste stream generated during this project will be evaluated to ensure that it meets the waste acceptance criteria and packaging requirements for the proposed treatment, storage, and disposal (TSD) facilities prior to transport.

If subcontracted by Foster Wheeler Environmental, the disposal facility will be approved under Foster Wheeler Environmental Subcontracting Procedures which require that the disposal facility:

- Is in physical compliance with RCRA or other applicable federal and state laws;
- Is not releasing any hazardous wastes, hazardous constituents or hazardous substances;
- Meets minimum technology requirements; and
- All releases, including environmentally significant releases at non-receiving units, at the facility will be addressed by a corrective action program.

The facility must demonstrate a properly designed system, and must presently operate (and historically have operated) in a manner that controls the types of materials accepted for disposal. Invoices will be returned by the landfill operators verifying that the waste was received and properly disposed. Foster Wheeler Environmental will provide a copy of the facility compliance check documentation to the Navy with the Waste Profile.

Foster Wheeler Environmental will be responsible for preparation of the waste disposal manifests. The manifests will be reviewed and signed by the Navy as generator of the waste. Manifests will be carried by the transporters and will include the following:

- The generator's name, mailing address, site address if different from the mailing address, and phone number;
- The generator's EPA I.D. number;
- The hauler (or haulers) name, phone number;
- The hauler (or haulers) EPA I.D. number;
- The treatment, storage or disposal facility's name, address, and telephone number (designated facility);  
The treatment, storage, or disposal facility's EPA I.D. number;
- The name, type, and quantity of hazardous waste being shipped, proper DOT shipping name, hazard class, and I.D. number;
- Special handling instructions and any other information required on the form to be supplied by the generator;
- When shipping hazardous waste to a waste reuse facility, the generator will enter the waste reuse facility I.D. number in section G; and,
- The proper codes that accurately describe the shipment of hazardous waste.

Before allowing the manifested waste to leave the property, the appropriate Navy representative must:

- Sign the manifest certification by hand;
- Obtain the handwritten signature of the initial hauler and date of acceptance on the manifest;
- Retain one copy; and
- Give the remaining copies of the manifest form to the hauler.

#### 6.9 AIR POLLUTION CONTROL

Fugitive dust emissions may result from project operations. Consequently, engineering controls will be used to control dust emissions. This shall include keeping surfaces adequately wet during invasive activities and covering materials being transported to prevent fugitive dust emissions.

#### 6.10 TRANSPORT

To ensure safe transport of the waste, only transporters who have demonstrated competence and the required license and permits for transporting waste will be used. Foster Wheeler Environmental policies and procedures for subcontracting will be followed. Transporter EPA/State identification numbers will be kept in project and compliance files. Trucks will be covered to prevent fugitive releases of material during transport.

#### 6.11 DOT REQUIREMENTS

All waste materials destined for off-site material are expected to be non-hazardous and will not meet the definition of a DOT hazardous material, however in the event hazardous materials are encountered, FWENC will follow the following requirements. Hazardous material will be properly classed, described, packaged, marked, labeled and in condition for shipment as required by 49 CFR 171.

Waste that does not exhibit one of the nine DOT hazard class characteristics (i.e., explosive, flammable, poison, combustible, etc.) is not regulated under DOT rules for the transportation of hazardous material. If waste is suspected to be hazardous, then it will be shipped under the suspected hazard class. If a particular hazard class is unable to be determined, then the soil or water may be shipped under either of the following:

Shipping Name	Hazard Class	ID Number	Packing Grou	Label
Environmentally hazardous substances, liquid, n.o.s.	9	UN3082	III	CLASS 9
Environmentally hazardous substances, solid, n.o.s.	9	UN3077	III	CLASS 9

When using either one of these "n.o.s." (not otherwise specified) shipping names, at least two technical names must follow (i.e., "Environmentally hazardous substances, liquid, n.o.s. [Benzene and Acetone]").

The shipping name, identification number, packing group, instructions, cautions, weights, EPA waste code numbers and consignee/consignor designations will be marked on packages for shipment. Labeling provides information regarding the DOT hazard class.

The label to be placed on material will depend upon the results of sampling. Once the waste is characterized, reference should be made to the Hazardous Materials Table in 49 CFR 172.101 to determine the appropriate label. The package (or drum) will be marked and labeled as specified in 49 CFR 172.301.

The person offering hazardous material for shipment will offer placards (49 CFR 172.506). Any quantity of material listed in Table 1 of the regulations will be placarded. However, if there is less than 1,000 lb. of a Table 2 material, no placard is required. No Class 9 placard is required for domestic shipments. If a placard is required, the label referenced above will be affixed on each side and each end of the vehicle(s).

Hazardous material shipping papers will have the following description of the hazardous material, in the following order:

- Proper shipping name;
- Hazard class or division;
- Identification number;
- Packaging group;
- Total quantity (must appear either before or after the above information); and,
- Technical and chemical group names may be entered in parentheses between the proper shipping name and hazard class or following the basic description (e.g., "Flammable liquids, n.o.s. [contains xylene and benzene], 3 UN1993, PG II").

Other required information includes:

- EPA identification (manifests);
- Emergency Response Guidebook numbers;
- Twenty-four (24) hour emergency response number, supplied by the generator and answered by a knowledgeable person;
- Signatures; and
- Shipper's certification.

## 7 FIELD ADMINISTRATIVE PROCEDURES

### 7.1 DAILY SAFETY MEETING

FWENC supervisory personnel will hold daily tailgate safety meetings to advise the workers of proper methods of performing the work planned for the day. The topics of discussion will be listed on a sign-in sheet and the sheet will be kept as a record of the meeting.

### 7.2 STATUS REPORTS

FWENC will prepare monthly status reports of the current condition of the project. The status reports will include a Technical Progress Report, Non-Compliance Report, Cost Performance Report, Project Schedule, updated Submittal Register, Government Materials Tracking Report, Variance Analysis Report, and a Waste Materials Report.

### 7.3 DAILY REPORT/CQC REPORT

Every day that work is performed, FWENC will prepare and submit the Daily Report/CQC Report to the Navy. The report will be submitted the following business day.

### 7.4 SUBMITTAL REGISTER

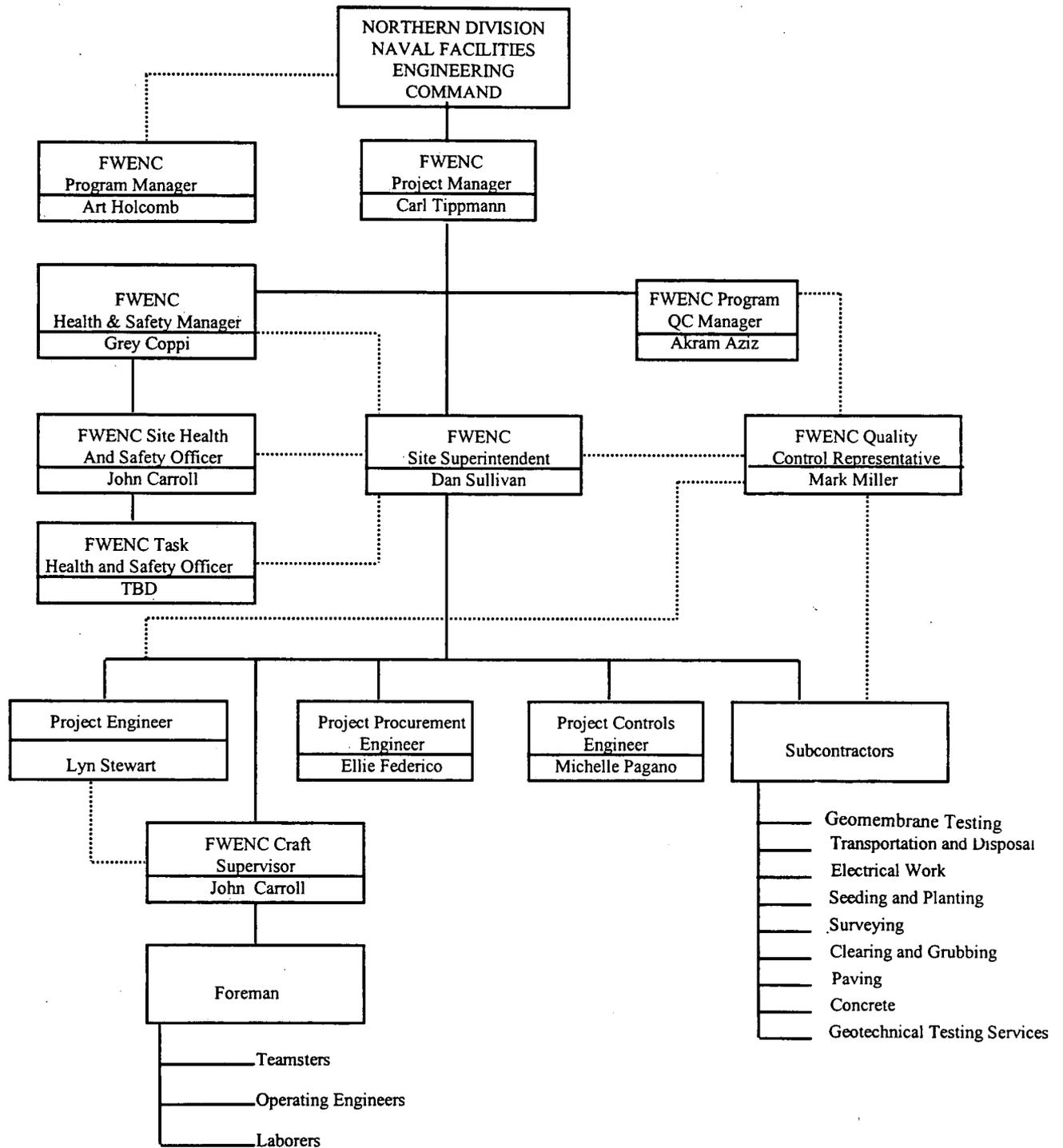
The CQC representative will prepare and continually update a Submittal Register to document quality control for materials, inspection, and testing. The Submittal Register will be maintained on site and available for review.

### 7.5 REGULATORY AGENCY PERSONNEL SITE VISITS

Regulatory agency personnel who visit the site and who have questions or comments concerning the work will give those questions or comments, in writing, to the project superintendent, who will then forward it to the Navy NTR.

**ATTACHMENT 1**  
**PROJECT ORGANIZATION CHART**  
Attached - Electronic file

ATTACHMENT 1



LEGEND:  
 TBD - To be Decided  
 ——— Reports to  
 ..... Interfaces with

PROJECT ORGANIZATION CHART  
 REMEDIAL ACTION  
 NAVAL WEAPONS STATION EARLE  
 COLTS NECK, NEW JERSEY  
 prepared for  
 DEPARTMENT OF THE NAVY  
 NORTHERN DIVISION  
 NAVAL FACILITIES ENGINEERING COMMAND  
 LESTER, PENNSYLVANIA

ATTACHMENT 2  
CONSTRUCTION SCHEDULE

Early Start	Early Finish	Percent Complete	1997												1998				1999		
			SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	
<b>Pre-Construction</b>			<ul style="list-style-type: none"> <li>◆ Submit Proposal</li> <li>■ Navy Negotiations</li> <li>◆ Contract Award</li> <li>■ Pre-Construction Submittals/Plans</li> <li>■ Regulatory Review</li> <li>■ Mobilize Construction Equipment</li> <li>■ Mobilize Personnel</li> </ul>																		
<b>Mobilization/Preparatory Work</b>																					
11SEP97A		100																			
11SEP97A	25SEP97A	100																			
	25SEP97A	100																			
26SEP97A	12DEC97	65																			
15DEC97	02JAN98	0																			
12JAN98	19JAN98	0																			
12JAN98	19JAN98	0																			
<b>Site 4 Construction</b>			<ul style="list-style-type: none"> <li>■ Temporary Facilities</li> <li>■ Temporary Utilities</li> <li>■ Silt Fence</li> <li>■ Reroute or Abandon Water Line</li> <li>■ Clear &amp; Grub for Ditches/Basins</li> <li>■ Temporary Berm/Ditches/Basins</li> <li>■ Clear &amp; Grub Remainder of Site</li> <li>■ Excavate/Consolidate/Regrade Waste</li> </ul>																		
<b>Site Work</b>																					
19JAN98	23JAN98	0																			
19JAN98	23JAN98	0																			
26JAN98	03FEB98	0																			
28JAN98	30JAN98	0																			
03FEB98	06FEB98	0																			
05FEB98	13FEB98	0																			
09FEB98	13FEB98	0																			
16FEB98	27FEB98	0																			
<b>Cap Construction</b>			<ul style="list-style-type: none"> <li>■ Gas Management Layer/Vents</li> <li>■ LDPE Liner</li> <li>■ Non-Woven Cushion Fabric</li> <li>■ Granular Drainage Layer</li> <li>■ Non-Woven Geotextile Filter</li> <li>■ Select Fill</li> <li>■ Topsoil</li> </ul>																		
02MAR98	13MAR98	0																			
16MAR98	27MAR98	0																			
25MAR98	06APR98	0																			
25MAR98	07APR98	0																			
06APR98	17APR98	0																			
06APR98	21APR98	0																			
20APR98	24APR98	0																			
<b>Site Restoration</b>			<ul style="list-style-type: none"> <li>■ Hydroseeding</li> <li>■ Re-Establish Roads/Structures/Utilities</li> </ul>																		
27APR98	28APR98	0																			
04MAY98	08MAY98	0																			
<b>Demobilization</b>			<ul style="list-style-type: none"> <li>■ Remove Temporary Facilities</li> </ul>																		
08JUN98	12JUN98	0																			

Project Start	01SEP97		Early Bar
Project Finish	03AUG98		Progress Bar
Data Date	21NOV97		
Run Date	12DEC97		

Early Start	Early Finish	Percent Complete	1997				1998								1999					
			SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
<b>Site 5 Construction</b>																				
<b>Site Work</b>																				
12JAN98	19JAN98	0																		
19JAN98	27JAN98	0																		
19JAN98	12FEB98	0																		
28JAN98	03FEB98	0																		
04FEB98	11FEB98	0																		
09FEB98	06MAR98	0																		
09MAR98	27MAR98	0																		
<b>Cap Construction</b>																				
23MAR98	10APR98	0																		
06APR98	24APR98	0																		
20APR98	07MAY98	0																		
20APR98	08MAY98	0																		
27APR98	14MAY98	0																		
27APR98	15MAY98	0																		
11MAY98	22MAY98	0																		
<b>Site Restoration</b>																				
27APR98	08MAY98	0																		
11MAY98	15MAY98	0																		
18MAY98	22MAY98	0																		
25MAY98	05JUN98	0																		
25MAY98	27MAY98	0																		
<b>Demobilization</b>																				
08JUN98	12JUN98	0																		
<b>Post-Construction</b>																				
<b>Demobilization</b>																				
08JUN98	03AUG98	0																		
15JUN98	19JUN98	0																		
22JUN98	26JUN98	0																		

Temporary Facilities

Silt Fence

Skeet Range Demolition

Clear & Grub for Ditches/Basins

Clear & Grub Remainder of Site

Temporary Ditches/Basins

Excavate/Consolidate/Regrade Waste

Gas Management Layer/Vents

LDPE Liner

Non-Woven Cushion Fabric

Granular Drainage Layer

Non-Woven Geotextile Filter

Select Fill

Topsoil

U/G Electrical/Telephone

Rock Base Course

Asphalt Wear Course

Re-Establish Skeet Range

Hydroseeding

Remove Temporary Facilities

Final Report

Demobilize Construction Equipment

Demobilize Personnel

Project Start 01SEP97  
Project Finish 03AUG98  
Data Date 21NOV97  
Run Date 12DEC97

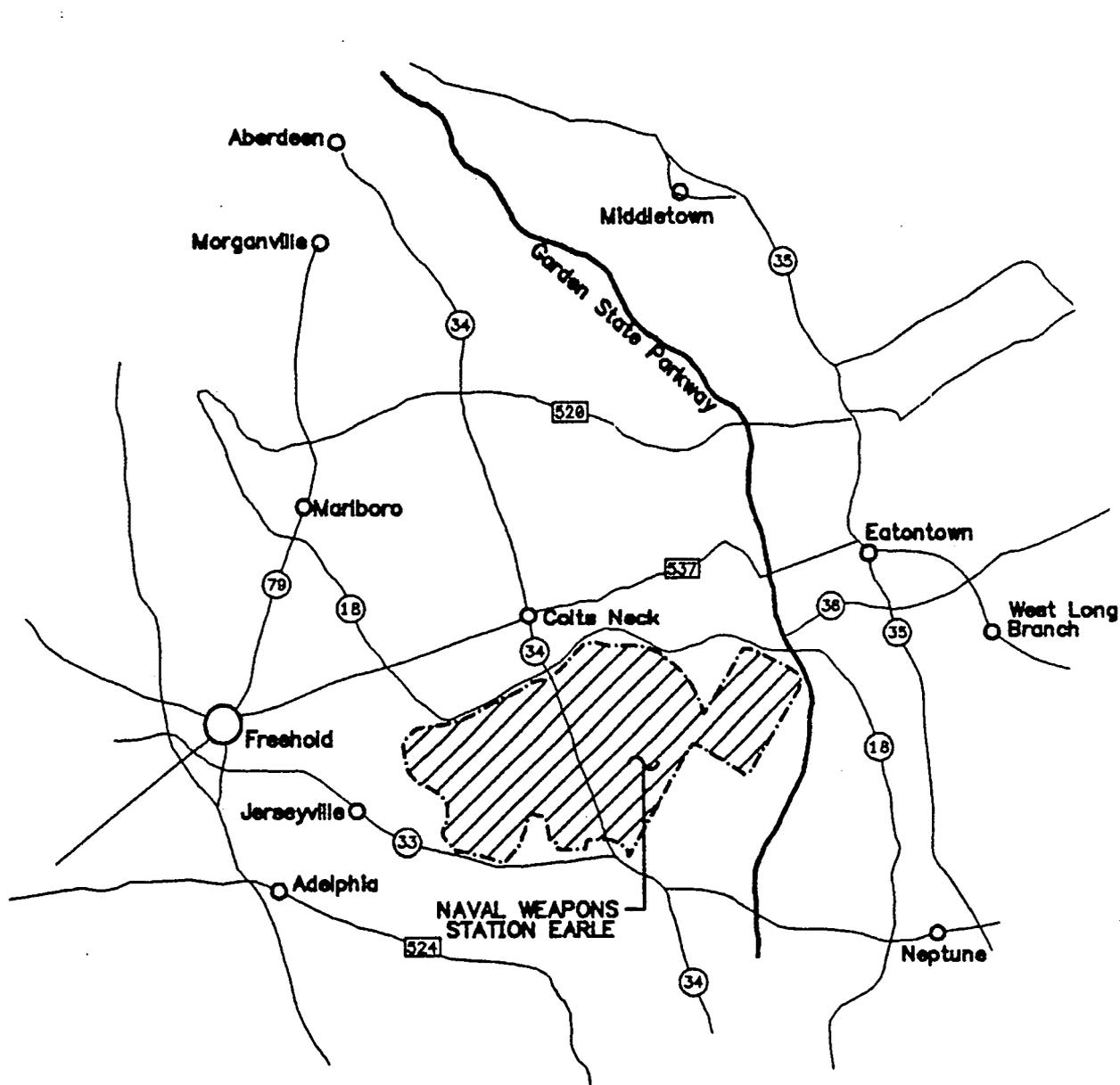
Early Bar  
Progress Bar

3400

Sheet 2 of 3

D.O. 34 - NWS EARLE  
Landfill Cap Construction

ATTACHMENT 4  
SITE MAPS -FIGURES 1 AND 2  
*Attached - Hard copy only*



N.T.S.

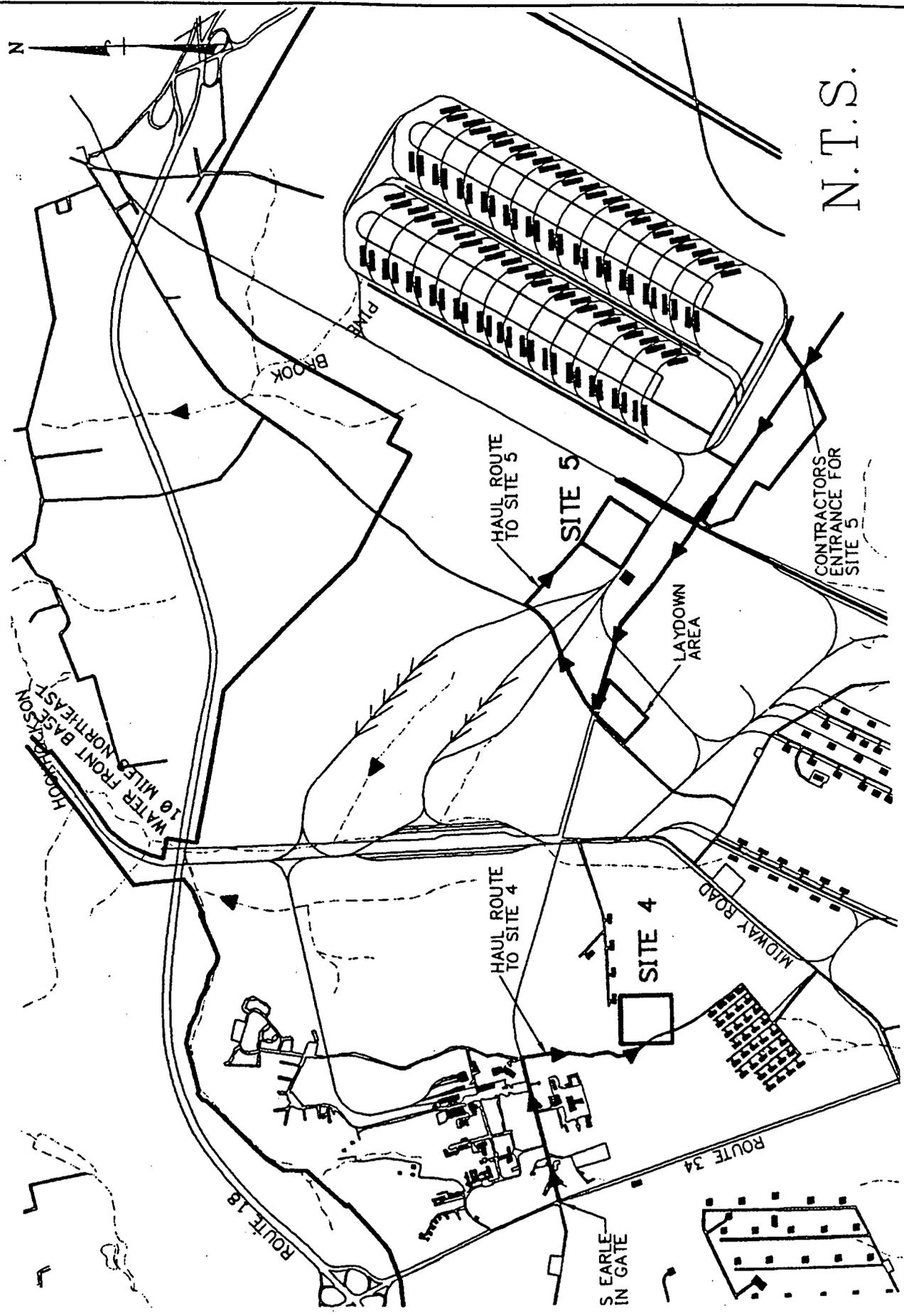
PLOT DATE DE 1997 D:\EarleLandfill\Fig1-2



**FOSTER WHEELER  
ENVIRONMENTAL  
CORPORATION**

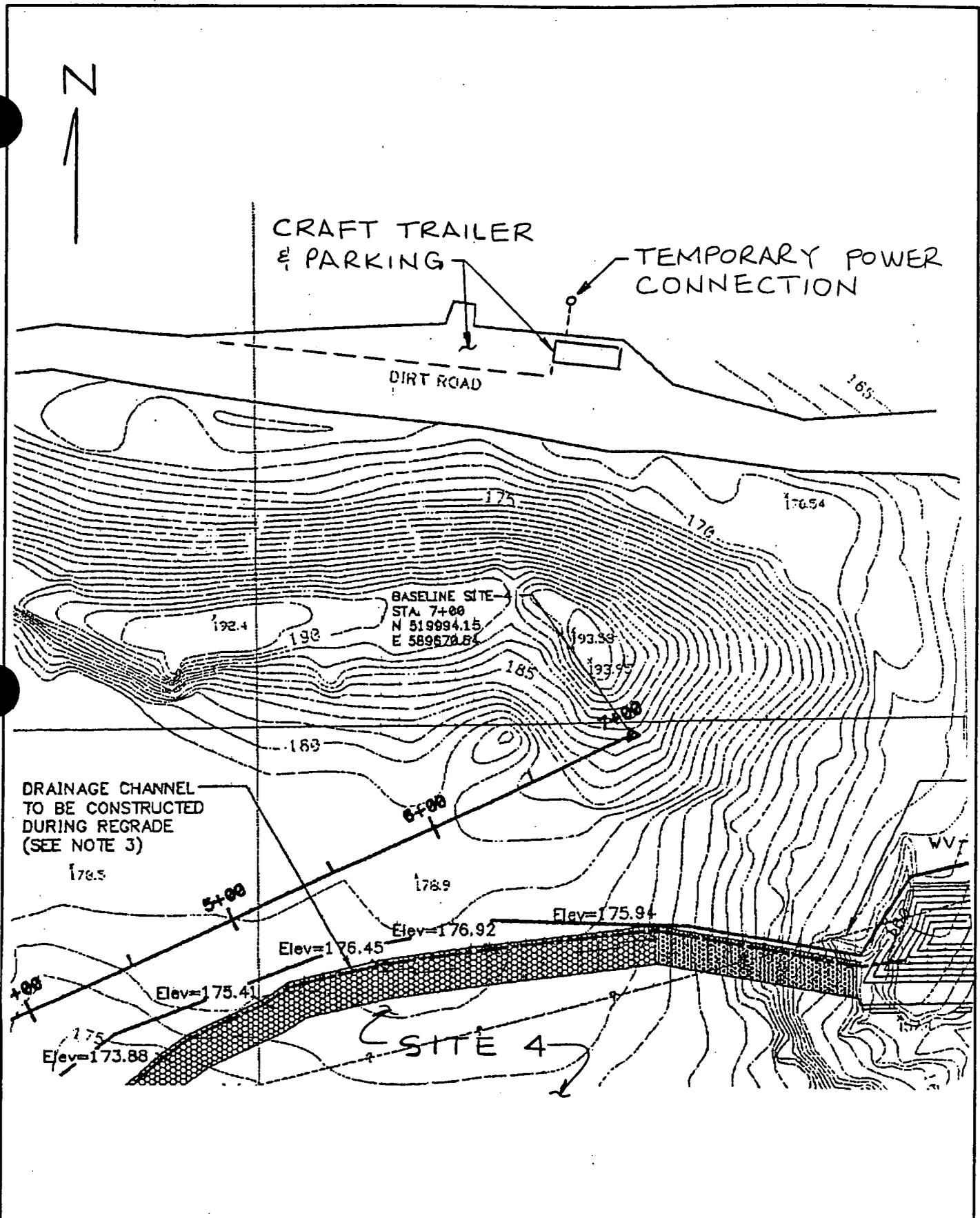
SITE VICINITY  
US NAVY RAC  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY

Figure  
**1**



ATTACHMENT 5  
SITE LAYOUT PLAN, FIGURES 3, 4, AND 5  
Attached - Hard copy only

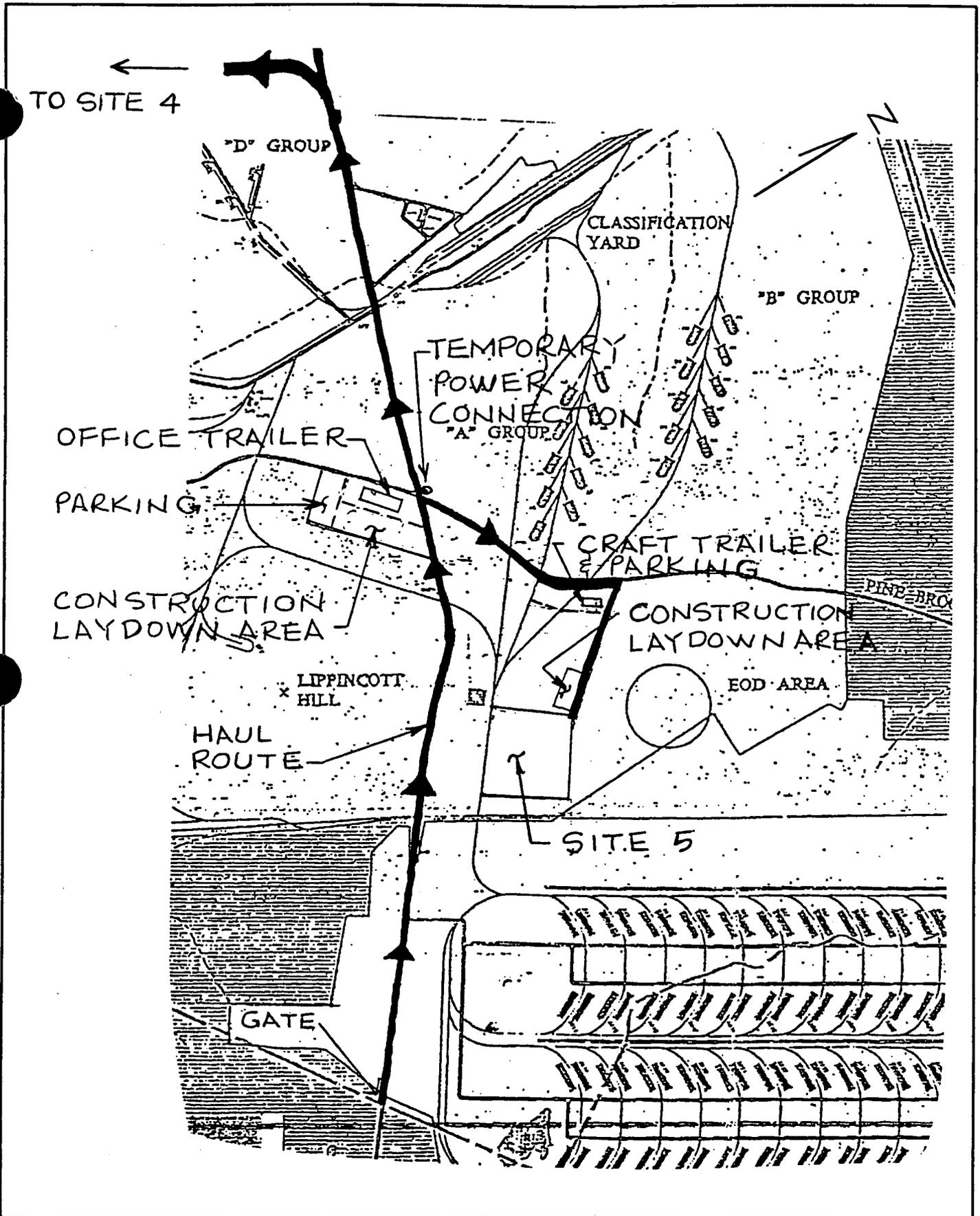




  
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 CORPORATION

SITE 4 LAYOUT PLAN "B"  
 US NAVY RAC  
 NAVAL WEAPONS STATION EARLE  
 COLTS NECK, NEW JERSEY

Figure  
 4



  
 FOSTER WHEELER  
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 CORPORATION

SITE 5 LAYOUT PLAN  
 US NAVY RAC  
 NAVAL WEAPONS STATION EARLE  
 COLTS NECK, NEW JERSEY

Figure  
 5

**U.S. NAVY NORTHERN DIVISION  
REMEDIAL ACTION CONTRACT (RAC)  
CONTRACT NO. N62472-94-D-0398  
DELIVERY ORDER NO. 0034**

**CONSTRUCTION QUALITY CONTROL (CQC) PLAN  
FOR  
REMEDIAL ACTION AT OPERABLE UNIT 1 (SITES 4 AND 5)**

**NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY**

**January 1998**

Prepared by

Foster Wheeler Environmental Corporation

Revision

1

Date

1/30/98

Prepared By

P. Mooney

Approved By

A. Aziz



Pages Affected

2-2 to 2-7, 2-11, 2-13

ND98-010  
1/30/98

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#### APPENDIX A: FORMS AND REPORTS

- A.1: Daily CQC Report Form
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- A.5: Submittal Transmittal Form
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- A.7: Geotextile and Geomembrane Inspection Forms
- A.8: Nonconformance Report
- A.9: RFI/FCR Forms
- A.10: Punch List Form
- A.11: Initial Submittal Register

## **1.0 INTRODUCTION**

This document presents the Construction Quality Control (CQC) Plan for the Remedial Action (RA), which consists of the installation of a final cover system on the Landfill Sites 4 and 5 located at the Naval Weapons Station (NWS) Earle in Colts Neck, New Jersey. This CQC Plan will be considered part of the contract documents for this project. The purpose of this plan is to specify methods, procedures, and frequency of inspection and testing activities to verify the quality of the installation of the final cover system on Site 4 and 5 Landfills in accordance with the Construction Drawings and Technical Specifications presented to the U.S. Environmental Protection Agency Region II (USEPA) and the New Jersey Department of Environmental Protection (NJDEP). The data and information collected during this program will be used as the basis for the Certifying Engineer to certify that the cover system has been installed in accordance with the Construction Drawings and Technical Specifications.

The activities addressed by this plan consist of the construction of multi-layered final cover systems and associated surface water management. Two distinct areas are to be capped: Site 4 involving Wetland Restoration and Site 5 with a Skeet Range and paved/parking areas. The cover systems feature, in ascending order, a bedding/gas management layer, a very flexible polyethylene (VFDE) geomembrane, a geotextile cushion fabric, a granular drainage layer, a non-woven geotextile, select fill and topsoil. At Site 5 areas for roadway and parking receive a stabilization fabric and aggregate surface course while paved areas receive stabilization fabric, aggregate base and asphalt surface course. Sideslopes and drainage channels feature riprap protection.

The Quality Control (QC) program outlined in this plan was developed to verify that the placement and quality of the materials are in compliance with the Construction Drawings and Technical Specifications.

This CQC Plan was prepared in accordance with the guidelines presented in the USEPA Technical Guidance Document, Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R-93-182).

## **2.0 PROJECT ORGANIZATION AND STRUCTURE**

### **2.1 General**

The organizations involved in the Landfill Sites 4 and 5 remedial action include regulatory agencies, the U.S. Navy Northern Division (the Navy), and the Remedial Action Contractor (RAC). The regulatory agencies are the United States Environmental Protection Agency Region II (USEPA) and the New Jersey Department of Environmental Protection (NJDEP). Representatives of the Navy will act as Remedial Project Manager Navy Technical Representative (RPM NTR), Construction Navy Technical Representative (Construction NTR), Design Navy Technical Representative (Design NTR), and RAC Contracting Officer's Technical Representative (COTR). Representatives of the RAC will act as the Certifying Engineer, QC Manager and Site Quality Control Representative (SQCR).

The role of CQC personnel is described within this CQC document.

### **2.2 Organization and Responsibilities**

The following section describes the responsibilities and lines of authority within each organization involved in the project and construction quality control. A project organizational list is provided on Table 2-1 and a project organizational chart is shown on Figure 2-1.

#### **2.2.1 U.S. Navy Northern Division**

The U.S. Navy Northern Division (Northdiv), as facility owner, will designate an employee of NWS Earle's office of the Resident Officer In Charge of Construction (ROICC) as the Construction NTR to manage the RAC. The RAC is responsible for daily landfill construction operations and providing CQC personnel to oversee these operations.

Northdiv has the authority to select and dismiss organizations charged with design, CQC, and construction activities, and to accept or reject Construction Drawings and Technical Specifications, CQC Plan, reports, recommendations of the RAC's Certifying Engineer, and the materials and workmanship of the RAC.

##### **2.2.1.1 Construction NTR**

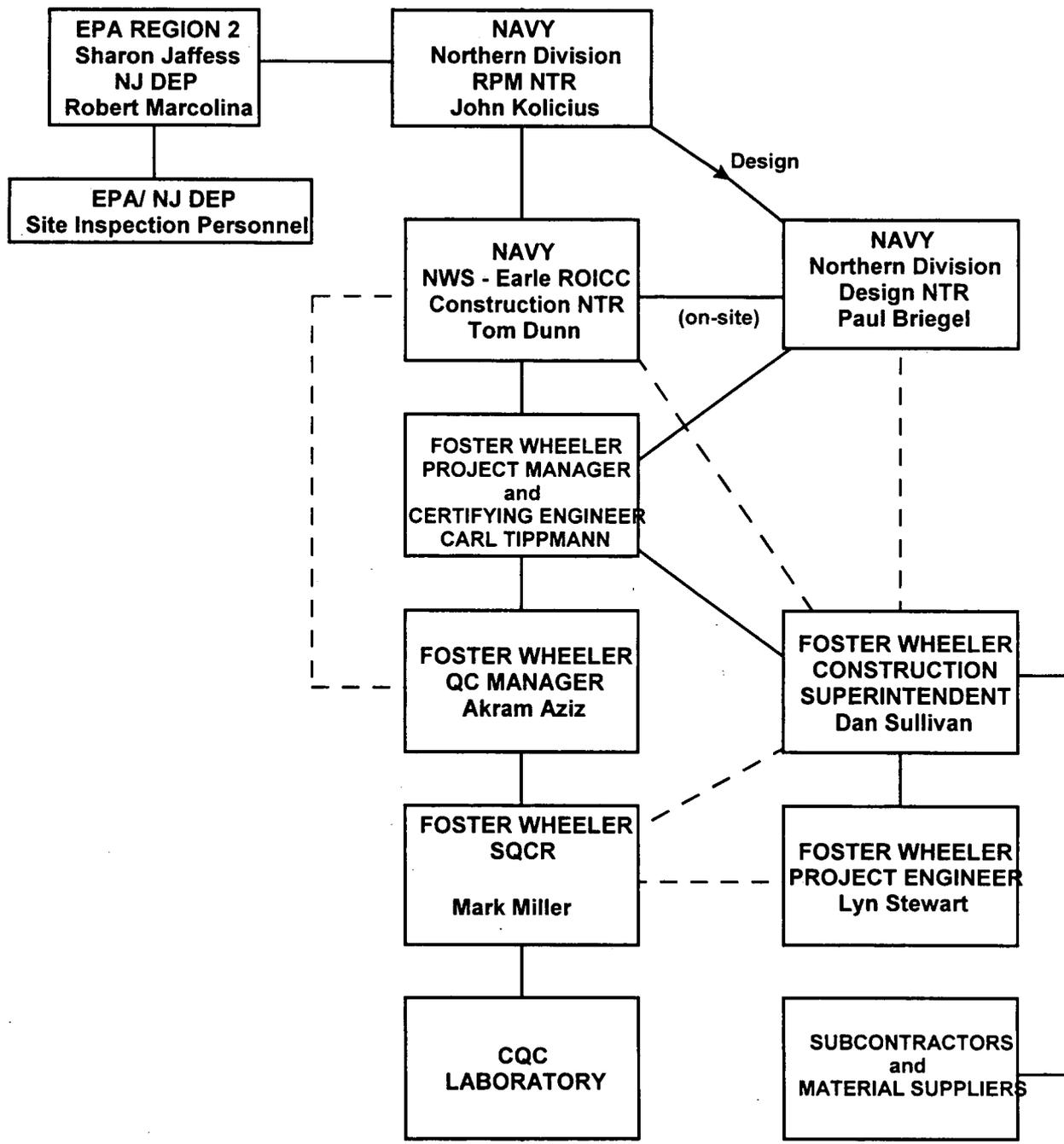
The Construction NTR will be an employee of NWS Earle's ROICC office and will be the Navy's local representative for the project. The Construction NTR has the responsibility of coordinating construction and CQC activities so that they are conducted in accordance with Construction Drawings and Technical Specifications. He interfaces with the RAC's Construction Representative, SQCR, and QC Manager regarding daily operations and conformance of construction activities with Construction Drawings and Technical Specifications. His responsibilities include the following:

- Ensuring that the project scope and objectives are defined and that procedures, schedules, budgets and manpower requirements are established.
- Establishing project procedures, instructions, lines of communication, working relationships, controls, and reporting requirements within the project.

**TABLE 2-1  
PROJECT ORGANIZATION LIST  
LANDFILL SITES 4 AND 5 REMEDIAL ACTION  
NAVAL WEAPONS STATION EARLE**

<b>Function</b>	<b>Firm</b>	<b>Contact</b>	<b>Phone No.</b>
RPM NTR	NAVFAC, Northdiv Environmental Dept.	John Kolicus	(610) 595-0567, Ext. 162
Design NTR	NAVFAC, Northdiv Civil Design	Paul Briegel	(610) 595-0590
COTR	NAVFAC, Northdiv Civil Design	Paul Briegel	(610) 595-0590
Construction NTR	NWS-Earle ROICC Office	Tom Dunn	(732) 866-2048
Regulatory Agencies	USEPA NJDEP	Sharon Jaffess Robert Marcolina	
RAC Project Manager and Certifying Engineer	Foster Wheeler Environmental Corp.	Carl Tippman	(215) 702-4044
RAC QC Manager	Foster Wheeler Environmental Corp.	Akram Aziz	(215) 702-4077
RAC Project Engineer	Foster Wheeler Environmental Corp.	Lyn Stewart	(770) 825-7206
RAC Construction Superintendent	Foster Wheeler Environmental Corp.	Dan Sullivan	(508) 397-2019
RAC SQCR	Foster Wheeler Environmental Corp.	Mark Miller	(215) 702-4000
QC Laboratory	TBD	TBD	

**FIGURE 2-1  
CQC ORGANIZATION CHART  
LANDFILL SITES 4 & 5 REMEDIAL ACTION  
COLTS NECK, NEW JERSEY**



----- Indirect Reporting Relationship

- Providing direction and guidance to the site project team with respect to their individual project responsibilities.
- Processing submittals, Requests for Information (RFIs) and Field Change Requests (FCRs) generated by the RAC and transmitted by the QC Manager.
- Reviewing CQC documentation to verify that corrective action has been satisfactorily completed when deviations are made from the Construction Drawings and Technical Specifications.

#### 2.2.1.2 Design NTR

The Design NTR will be an employee of Northdiv's Civil Design Department and will be the Navy's technical point-of-contact (POC) for the project. In particular, the Design NTR is responsible for coordinating the resolution of design engineering issues with the RAC.

#### 2.2.1.3 RPM NTR

The RPM NTR will be an employee of Northdiv's Environmental Department and will be the Navy's environmental POC for the project. In particular, the RPM NTR is responsible for interfacing with regulatory agencies (USEPA and NJDEP) and for coordinating the resolution of environmental issues with the RAC.

#### 2.2.2 Remedial Action Contractor (RAC)

Foster Wheeler Environmental Corporation is the Remedial Action Contractor for Landfill Sites 4 and 5. The RAC is responsible for implementation of construction activities in strict accordance with design criteria, Construction Drawings, and Technical Specifications using the necessary construction procedures and techniques. The RAC is also responsible for formulating and implementing a Construction Quality Control (CQC) Plan which addresses the rules and responsibilities of RAC project and CQC personnel, and outlines inspection and testing procedures to be conducted by CQC personnel and/or subcontractors.

Other RAC responsibilities include:

- Furnish the materials and equipment and utilize the specific means, methods, techniques, sequence, or procedure of construction as indicated in the Construction Drawings and Technical Specifications. In case of deviation, submit an RFI or FCR (as described in Section 5.0) to the QC Manager for evaluation and transmittal to the Construction NTR.
- Procure subcontractor services. Submit a scope of work description for these services to the Construction NTR for acceptance.
- Prepare Daily Reports as described in Section 5.1 and submit these reports to the Construction NTR.
- Initiate, maintain, and supervise all safety precautions and programs in connection with the work.
- If conflict, error, or discrepancy is found in contract documents or existing field conditions differ materially from those indicated, report in writing (via an RFI) to the QC Manager and

Construction NTR before proceeding to obtain a written interpretation or clarification from the Navy.

- Notify in writing the QC Manager and Construction NTR of any subsurface or latent physical conditions encountered which differ materially from those specified or indicated.
- Implement the Foster Wheeler CQC Plan and establish a chain of command.
- Provide the construction superintendent who will be responsible for the field construction operations and the Site Quality Control Representative (SQCR) who will be responsible for the implementation of the Foster Wheeler CQC Plan.
- Maintain at the site a record copy of As-Built Drawings, a copy of specifications, addenda, written amendments, change orders, work directive changes, field test records, field orders, and written interpretations and clarifications. Upon completion of the work, deliver these records to the Construction NTR.

#### 2.2.2.1 Certifying Engineer

The Certifying Engineer is responsible for determining if operations are conducted in accordance with approved Construction Drawings, Technical Specifications, and permits, and for reporting deviations from these plans and procedures to the Construction NTR.

The Certifying Engineer will also be responsible for assuring that quality control inspections and/or sampling and testing activities are conducted as specified in the CQC Plan. He reports to the Construction NTR regarding QC data documented by the QC Manager.

Submittals, correspondence, or other relevant project documentation will be submitted to the Certifying Engineer by the RAC's QC Manager.

Specific tasks to be performed by the Certifying Engineer include:

##### Submittal Review

The Certifying Engineer will review the RAC submittals as listed in the register appended to the Technical Specifications. The Register of Submittals is included in Appendix A. The Certifying Engineer will provide the Construction NTR with a memo outlining the documents reviewed and any comments or concerns within 10 working days of receipt of each submittal. The submittals will be provided by the RAC to the Certifying Engineer through the QC Manager.

##### Oversight

The Certifying Engineer will provide limited on-site oversight/inspection during construction of the final cover system as described previously. Oversight will consist of field inspections during critical construction sequences, such as installation of the VFPE geomembrane, to verify that construction is proceeding in accordance with the Construction Drawings, Technical Specifications, and the CQC Plan. The Certifying Engineer will notify the Construction NTR in the event of any observed non-compliance and recommend appropriate action.

The Certifying Engineer will be available for daily communication with the QC Manager to discuss CQC activities and their results and to comment upon the RAC's Daily Reports. The Certifying Engineer will also review and comment upon the Weekly Summary Reports prepared by the QC Manager prior to submittal of these reports to the Construction NTR.

### Project Meetings

The Certifying Engineer will be available to attend or participate in all weekly project QC and management team review meetings, either in person, if present in the field, or via teleconferencing. He will also participate in appropriate progress meetings.

### Final Report

At the completion of the project, the Certifying Engineer will prepare and certify a Final Report documenting the CQC activities conducted during the construction of the final cover system. Conformance of the RA to the Construction Drawings and Technical Specifications will be documented in the Final Report. The contents of the Final Report are further described in Section 5.6.

#### 2.2.2.2 QC Manager

The QC Manager reports to the Certifying Engineer and interfaces with the Construction NTR and the RAC's SQCR. Specific tasks to be performed by the QC Manager include the following:

- Witness the RAC's construction activities and inspect the ongoing and completed work.
- Observe personnel and equipment working on site for cross-checking of the RAC's Daily Reports.
- Monitor the RAC's SQCR testing program for adherence to the requirements of the Construction Drawings and Technical Specifications.
- Perform QC Manager testing in accordance with the CQC Plan. This includes the performance of field tests, the collection and shipment of samples for laboratory testing, the preparation of inspection and testing reports as described in Section 5.2, and the reporting of any QC deficiencies to the Construction NTR and Certifying Engineer.
- Prepare and submit to the Construction NTR Weekly Summary Reports, as described in Section 5.3.
- Work in conjunction with the SQCR to establish and maintain a Rework Item List of work that does not conform to Construction Drawings and/or Technical Specifications. Track and monitor the items on the list to assure the rework inspection and testing activities and frequencies are in accordance with the contract requirements.
- Receive, review, and forward to the Certifying Engineer those submittals requiring Government approval.
- Receive, evaluate, and distribute the RFIs and FCRs received from the SQCR.
- Coordinate, facilitate, and prepare and distribute minutes for the weekly project QC and progress meetings.

- Monitor the SQCR's maintenance of As-Built Drawings, as described in Section 5.5.
- Participate in pre-final and final inspections of the completed work, prepare and maintain a detailed punch list, and verify that punch list items have been properly corrected.
- Collect samples for or perform QC Manager testing outlined in Table 4-1.
- Inform the Construction NTR, RPM NTR, Design NTR in order of availability of any site visit by regulatory agencies.
- Supervise and direct SQCR(s) if necessary due to increased work load.

#### 2.2.2.3 Site Quality Control Representative (SQCR)

The RAC's SQCR reports to the QC Manager and interfaces with the RAC's Construction Superintendent and Project Engineer.

The SQCR is responsible for coordinating inspection and surveillance activities. The SQCR or his delegate will monitor site activities on a full-time basis. The results of inspections and surveillances will be documented in the Daily Reports. The SQCR will also be responsible for:

- Implementation of the Foster Wheeler's CQC Plan.
- Performance of CQC inspection and field tests and preparation of inspection and testing reports as described in Section 5.2 and listed in Tables 3-1 and 3-2.
- Collection of samples for CQC laboratory testing and review of tests results.
- Preparation of Non-Conformance Reports, as described in Section 5.4.
- Maintenance of the latest applicable Construction Drawings and Technical Specifications with amendments and/or approved modifications at the job site and assure that they are used for shop drawings, fabrication, construction, inspections, and testing.
- Maintenance of As-Built Drawings as described in Section 2.5.4. The As-Built Drawings will be available for review at all times.
- Maintenance of a RAC-generated Submittal Register, ENG Form 4288, for the duration of the contract. A review of this Submittal Register will be performed monthly. Appropriate actions will be undertaken should slippages or other changes so necessitate. The initial Submittal Register is provided in Appendix A of this CQC Plan.
- Review shop drawings and/or other submittals for compliance with the contract requirements prior to their submission to the QC Manager for review, action, and transmission to the Construction NTR.
- Establish and maintain in conjunction with the QC Manager a Rework Item List for work that does not conform to Construction Drawings and/or Technical Specifications. Track and

monitor the items on the list to assure the rework inspection and testing activities and frequencies are in accordance with the contract requirements.

- Assist the Construction NTR, Certifying Engineer, and QC Manager at the pre-final inspection and final acceptance inspection.
- Maintain a dated photographic log of the project.

### **2.3 Project Meetings**

Progress meetings will be held to review current project status and enhance coordination and communication. Weekly progress meetings will be conducted during construction. Additional meetings, including problem or work deficiency meetings, will also be conducted as deemed necessary.

The weekly progress meetings will be coordinated and facilitated by the QC Manager and attended by the Construction NTR, the RAC's Construction Superintendent, Project Engineer, and SQCR. The Certifying Engineer will be available to attend the weekly progress meetings in person whenever present on site and via teleconferencing when not. The QC Manager will prepare and distribute the minutes of the weekly progress meetings. Weekly progress meetings will include discussions of the following, as applicable:

- Review of the previous week's activities and accomplishments.
- Review of the current week's activities.
- Discuss any potential problems.
- Discuss any existing construction problems and deficiencies, current status of resolution and action plans.
- Discuss status of submittals, Requests for Information (RFI), Field Change Requests (FCRs), etc.

### **2.4 Qualifications Of Key Personnel**

#### **2.4.1 Certifying Engineer**

The Certifying Engineer assigned to the project will possess the following minimum qualifications:

- Bachelor of Science in Civil Engineering.
- Registration as a Professional Engineer (P.E.) in the State of New Jersey.
- Five (5) years experience in Civil Engineering design of landfill cover systems and a demonstrated competency for the certification of landfill cover systems or like installations.

#### **2.4.2 QC Manager**

The QC Manager assigned to the project will possess the following minimum qualifications:

- Bachelor of Science in Civil Engineering.
- Three years of experience in civil engineering and demonstrated capability of thoroughly understanding Construction Drawings and Technical Specifications for landfill cover systems.

- Sufficient practical, technical, and administrative experience to execute and record inspection activities successfully. Such training will include demonstrated knowledge of specific field practices relating to construction techniques used for hazardous waste land disposal facility closures, knowledge of all codes and regulations concerning material and equipment installation, observation, and testing procedures, equipment, documentation procedures, and site safety.

## **2.5 Design Documents**

### **2.5.1 Purpose**

This section describes the procedure for controlling the receipt, processing, and distribution of design documents, including revisions to these documents in the form of field changes. It ensures that project personnel and subcontractors use the correct design document revision.

### **2.5.2 General Requirements**

The RAC will maintain a master control register which identifies the current revision of Construction Drawings, Technical Specifications, and other design documents transmitted to the job site. It is the responsibility of the RAC to receive, control, and distribute design documents and design document changes at the job site.

### **2.5.3 Receipt, Control, and Distribution of Design Documents**

The CQC Plan establishes a system for the receipt, control and distribution of design documents, including Construction Drawings and Technical Specifications, As-Built Drawings, subcontractor submittals, RFIs, and FCRs.

The RAC is responsible for design document control in the field.

### **2.5.4 Red-Line and As-Built Drawings**

The RAC is responsible for maintaining, on a day-to-day basis, a complete set of full-size red-line drawings, which are Construction Drawings reflecting the latest design changes and current as-built conditions. Red-line drawings conform to the following:

- Red pen is used to indicate all changes to design.
- Surveyed measurements of final locations and elevations are indicated.
- Subcontractor-installed temporary work, which is not removed, is indicated and appropriately marked.
- As revised subcontract drawings are received, they are checked to determine whether as-built details have been incorporated into the revision. If any further as-built details pertinent to these drawings exist, they are transferred onto the red-line drawings.
- Other clarifying documents are noted on the affected red-line drawings.

At the conclusion of construction, the RAC will prepare and provide to the Design NTR marked-up Construction Drawings which reflect final field conditions. The RAC will provide certification that the marked-up Construction Drawings reflect as-built conditions.

The As-Built Drawings will document lines and grades and conditions of each component of the final cover system. This will be accomplished using one of two means: topographical survey and field measurement. A topographic survey will be performed and certified by a licensed surveyor for the regraded landfill surface (just prior to placement of the bedding/gas management layer) and the final cover surface (following completion of the final cover systems). Field measurement will be utilized to document the final cover system components' (soils and geosynthetics) thickness, lines, and grades, including soil test, geomembrane test, and panel seam locations. Locations of tests will be recorded daily and referenced to the existing landfill baseline (station, offset). For soil components, the As-Built Drawings will include the plan dimensions of the component and locations of all soil test samples. For geosynthetic components, the As-Built Drawings will show the dimensions of all geomembrane field panels, the location of each panel, identification of all seams and panels with appropriate identification numbering or lettering, location of all patches and repairs, and locations of all soil test samples. Separate drawings will be prepared to show as-built cross sections and special features.

#### 2.5.5 Changes to Design Documents

If a field situation requires clarification not provided by the Construction Drawings and Technical Specifications or necessitate a design change, the RAC will submit a Request for Information (RFI) or a Field Change Request (FCR) to the QC Manager. RFIs are for specific requests (e.g., can RAC use different telephone poles for communication wiring?). FCRs are to identify in detail a problem and propose a solution (e.g., excess rock cut/fill - propose crushing to use as gabion aggregate). The QC Manager will transmit the RFIs and FCRs to the Construction NTR and the Certifying Engineer. The RFIs and FCRs will then be evaluated by the QC Manager and Certifying Engineer presenting a recommendation and a decision being reached by the Construction NTR. If this decision involves a design change, the Certifying Engineer, Design NTR, and RPM NTR will assess this change and, if necessary, the RPM NTR will direct the Certifying Engineer to have the QC Manager submit the FCR to USEPA and NJDEP for information or approval. The RFI/FCR form attached in Appendix A will be used for transmittal. Upon receipt of USEPA's and NJDEP's approval, the Construction NTR will issue the approved RFI or FCR for implementation. Figure 2-2 provides a flow chart diagram of the RFI/FCR process.

#### 2.7 **Subcontractors**

The RAC's SQCR, and QC Manager will perform inspections, including a final inspection for acceptance of the work performed by subcontractors. These inspections ensure that the subcontractors are complying with the Construction Drawings, Technical Specifications, approved design changes, and subcontract documents. Such inspections are conducted daily during the subcontractor's activities. The RAC is responsible for all work and activities conducted or performed by their subcontractors.

The RAC may subcontract the various construction and test activities to organizations qualified to perform such activities. The RAC will retain the responsibility for construction quality control by performing inspections at intervals during construction and reserves the right to accept or reject items and installations as specified. The RAC will ensure that each subcontractor meets the technical and testing requirements of the Construction Drawings and Technical Specifications applicable to their scope of work.

Subcontract documents will include requirements for subcontractor submittals, inspections and tests which meet this CQC Plan. Requirements may be included in referenced Technical Specifications and Construction Drawings. Subcontract documents will include indication of submittal requirements which are prerequisite to specific field activities.

## **2.8 Submittals**

Submittals (shop drawings, samples, catalog cuts, certifications, manuals, part lists, inspection, test reports, etc.) relating to CQC are transmitted by manufacturers and subcontractors to the RAC and SQCR. A standard form, "Contractor Drawings & Information Submittal" (NORTHNAVFACEDNGCOM 4335/3), as attached in Appendix A, will be used for this transmittal.

Upon receipt of a submittal, the SCQR will review it for completeness and assign to each drawing, catalog cut, etc., an item number or control number; mark them accordingly; and enter these numbers on the appropriate transmittal form. The SCQR then logs all submittals in a Submittal Register as attached in Appendix A. The SCQR transmits the submittals to the QC Manager who, in turn, transmits it to the Certifying Engineer for review.

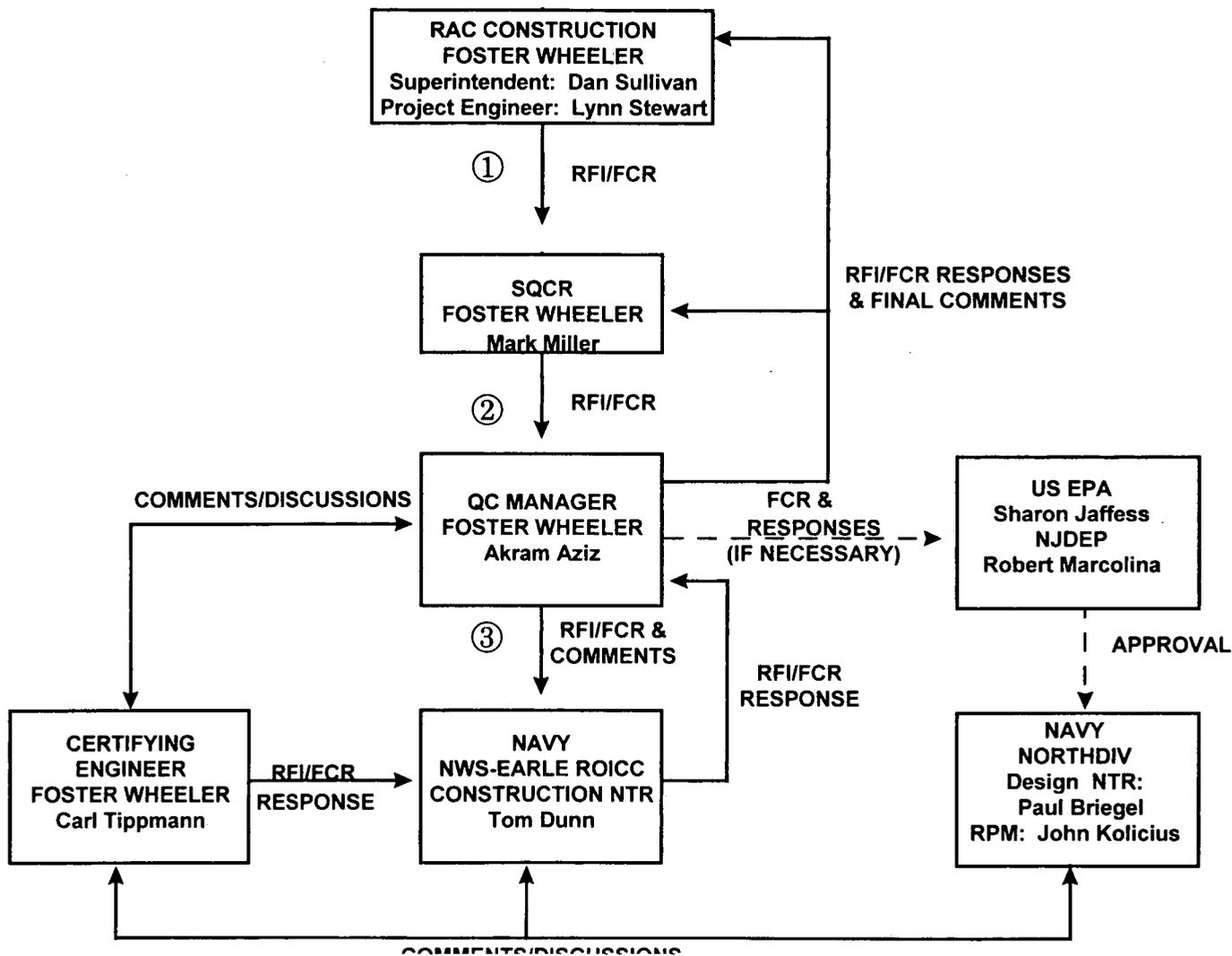
Once a submittal is received it is given a prompt review by the QC Manager and Certifying Engineer and transmitted to the Construction NTR with appropriate comments.

The Certifying Engineer stamps and signs the submittal and form with the following actions:

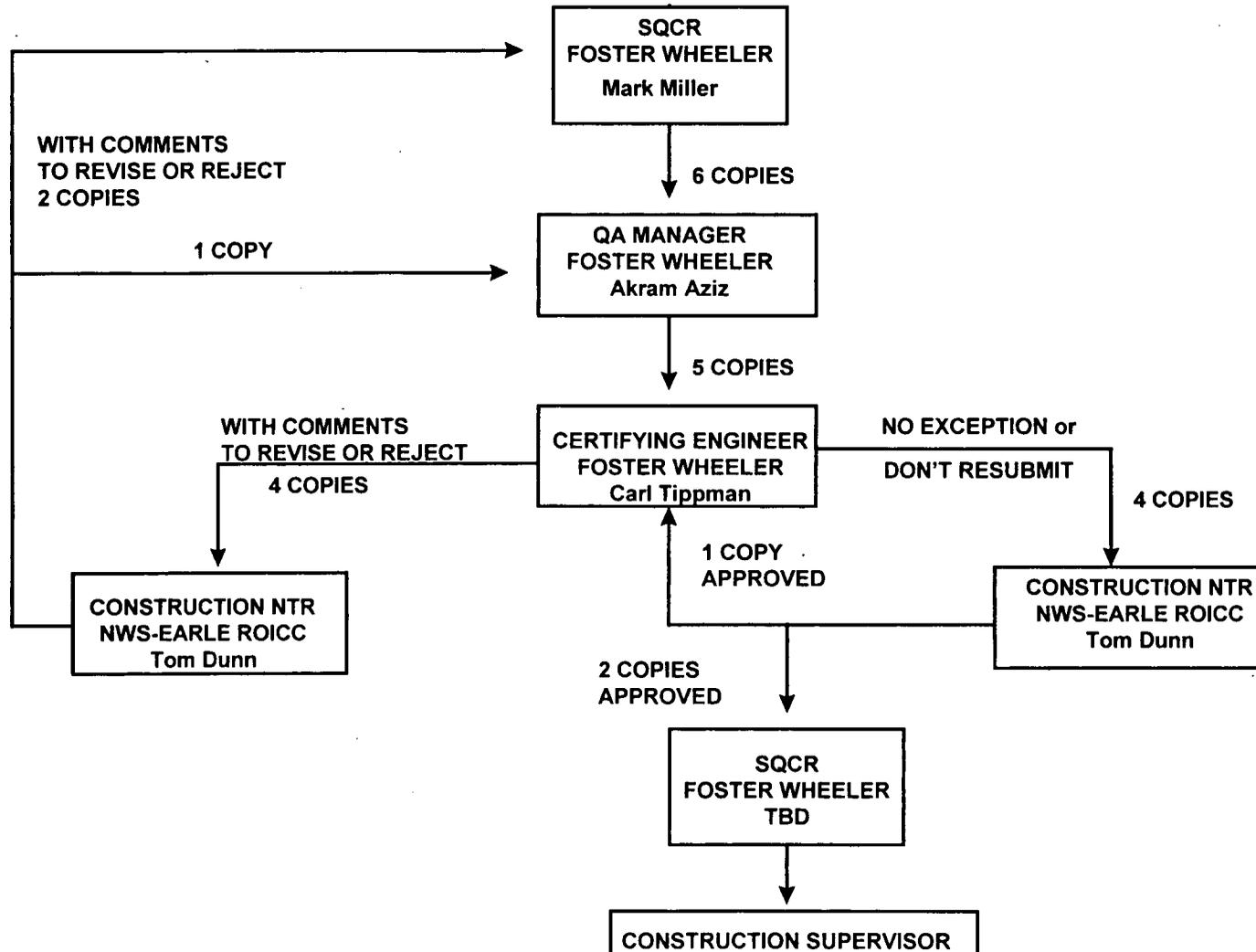
- "No Exception Taken, Do Not Resubmit" - This signifies conformance with the Construction Drawings and Technical Specifications.
- "Make Corrections As Noted, Do Not Resubmit" - This signifies general conformance with the Construction Drawings and Technical Specifications with minor changes required.
- "Make Corrections As Noted, Resubmit" - This signifies general conformance with the Construction Drawings and Technical Specifications, but more significant changes are required and must be verified and reviewed by the Certifying Engineer.
- "Rejected, Resubmit" - This signifies non-conformance with the Construction Drawings and Technical Specifications and requires resubmittal with conforming materials and methods.
- "Comments Attached" - This may be added to any of the above reviews to request additional information or provide clarification.

The Construction NTR then signs the submittal and returns it to the QC Manager for distribution to the SQCR and the Certifying Engineer. A flowchart of the submittal review process is shown on Figure 2-3.

**FIGURE 2-2  
RFI/FCR FLOW DIAGRAM  
LANDFILL SITES 4 AND 5  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY**



**FIGURE 2-3  
 SUBMITTAL REVIEW PROCEDURE FLOW DIAGRAM  
 SITES 4 AND 5 REMEDIAL ACTION  
 NAVAL WEAPONS STATION EARLE  
 COLTS NECK, NEW JERSEY**



### **3.0 SQCR TESTING AND INSPECTION ACTIVITIES**

The purpose of this section is to outline the pre-construction and conformance qualification testing and inspection requirements for each material for the remedial action. As appropriate, the key property, inspection method, test method reference, frequency of testing, specification, and response to a failed test or inspection is provided. The materials referenced herein are those described in the Construction Drawings and Technical Specifications of the November 1997 Final (100%) Design Document prepared by Brown & Root Environmental (B&R) for Landfill Sites 4 and 5 at Naval Weapons Station Earle.

Table 3-1 outlines the pre-construction SCQR testing to be performed by the RAC or manufacturer prior to acceptance, placement, or delivery. Table 3-2 outlines the construction conformance testing/inspection to be performed during placement and installation of the components of the remedial action.

It should be noted that, notwithstanding the information presented on these tables, the documents of reference for this project remain the Construction Drawings and Technical Specifications.

#### **3.1 Components/Elements**

The major construction tasks, elements, or components of the landfill cover systems that will be tested and/or inspected are listed below. See Tables 3-1 and 3-2 for specific requirements.

##### **3.1.1 Landfill Subgrade Preparation/Excavation**

Components of landfill subgrade preparation and landfill excavation consist of:

- Excavation of material within the limit of the existing landfill material to achieve the subgrade for the final cover system.
- Placement and compaction of fill materials within the limit of the existing landfill material to achieve the subgrade for the final cover system.

##### **3.1.2 Bedding/Gas Management Layer**

Components of the bedding/gas management layer placement consist of:

- Placement and compaction of gas management layer material for the final cover system.

##### **3.1.3 Drainage Layer Material**

Components of the drainage layer placement consist of:

- Placement and compaction of drainage layer material for the final cover system.

##### **3.1.4 Geomembranes**

Components of the geomembrane consist of:

- Installation of textured VFPE for the 4:1 sideslope cover system.
- Installation of smooth VFPE for the plateau area cover system.

### 3.1.5 Geotextiles

Components of the geotextile placement consist of:

- Placement of non-woven geotextile for the cover system between Drainage Material and Select Fill.
- Placement of non-woven geotextile beneath riprap.
- Placement of Roadway Stabilization Fabric for Cover system between Select Fill and Aggregate Courses.
- Placement of the non-woven Cushion Material between Geomembrane and Drainage Material.

### 3.1.6 Gas Management Piping

Components of the gas management piping construction include:

- Placement of the gas management piping system for the final cover system.

### 3.1.7 Aggregate Base Course Material

Components of the aggregate base course layer placement consist of:

- Placement and compaction of aggregate base course material for the final cover system.

### 3.1.8 Aggregate Surface Course

Components of the aggregate surface course layer placement consist of:

- Placement and compaction of surface course material for the final cover system.

### 3.1.9 Storm Drainage System

Components of the storm drainage system construction consist of:

- Placement of corrugated plastic pipe, fittings, and appurtenances for construction of the storm drainage system.
- Placement of the rip rap layer material for the sideslope cover system.
- Placement of the rip rap layer material for Drainage Channels.
- Placement of the topsoil for fortified Drainage Channels.
- Creation of Sediment/Detention Basins and Emergency Spillways.

### 3.1.10 Monitoring Wells

Components of the monitoring well construction consist of:

- Abandon existing well.
- Extend existing wells.

### 3.1.11 Turf

Components of the turfing of the final cover system consist of:

- Preparing subgrade and placing topsoil
- Hydroseeding finished surface.

### 3.1.12 Wetlands Mitigation

Components of the Wetlands Mitigation consist of:

- Relocating topsoil as part of Wetlands Restoration.
- Planting of trees and shrubs.

### 3.1.13 Relocation of Skeet Range Facilities

Components of Skeet Range relocation consist of:

- Removal and reestablishment of trap and sporting clay houses.
- Construction of cast in place concrete pads and paths.
- Construction of Waste Water Holding Tank and sanitary sewerage system.
- Placement and compaction of asphalt and aggregate surface course parking area.
- Provision of electrical power to skeet range facilities.
- Provision of new exterior light fixtures.

## 3.2 **Three Phases of Control**

The QC Manager and SQCR will perform the three phases of control to ensure that work complies with contract requirements. The Three Phases of Control will adequately cover the following for each definable feature of work. A definable feature of work is a task which is separate and distinct from other tasks and requires separate control requirements.

### 3.2.1 Preparatory Phase

The preparatory phase will be conducted with the QC Manager and/or SQCR, the superintendent, and the foreman responsible for the definable feature, documenting the results of the preparatory phase actions in the daily CQC Report. The following will be performed prior to beginning work on each definable feature of work:

- Review each paragraph of the applicable specification sections;
- Review the Contract Drawings;
- Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required;
- Review the testing plan and ensure that provisions have been made to provide the required QC testing;

- Examine the work area to ensure that the required preliminary work has been completed;
- Examine the required materials, equipment, and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data;
- Review the safety plan and appropriate activity hazard analysis to ensure that applicable safety requirements are met, and that required Material Safety Data Sheets (MSDSs) are submitted; and
- Discuss construction methods.

### 3.2.2 Initial Phase

When construction crews are ready to start work on a definable feature of work, the initial phase will be conducted with the QC Manager and/or SQCR, the superintendent, and the foreman responsible for that definable feature of work. Observe the initial segment of the definable feature of work to ensure that the work complies with contract requirements. Document the results of the initial phase in the daily CQC Report. Repeat the initial phase for each new crew to work on-site, or when acceptable levels of specified quality are not being met. Perform the following for each definable feature of work:

- Establish the quality of workmanship required;
- Resolve conflicts;
- Review the Safety Plan and the appropriate activity hazard analysis to ensure that applicable safety requirements are met; and
- Ensure that testing is performed by the approved laboratory.

### 3.2.3 Follow-Up Phase

The following will be performed for ongoing work daily, or more frequently as necessary, until the completion of each definable feature of work and document in the daily CQC Report:

- Ensure the work is in compliance with contract requirements;
- Maintain the quality of workmanship required;
- Ensure that testing is performed by the approved laboratory; and
- Ensure that rework items are being corrected.

TABLE 3-1

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (02142)</b>							
	Interface Friction Angles	Direct Shear Test	ASTM 5321	3 interfaces/source	Smooth VFPE/Cushion Fabric >8 deg; Textured VFPE/Cushion Fabric >25 deg; Drainage Layer/Cushion Fabric >25 deg	See Note 1	Reject Material
	Record Sample	NA	NA	1 per product	36" x 12" sample	See Note 1	NA
	Manufacturer's Qualifications	Review of Certification	NA	1 per manufacturer	Listed on the NSF as having met NSF Standard 54 for Flexible Membrane Liners, at least 5 years continuous experience in the manufacture of geomembrane rolls, or experience totaling at least 10 million sf of VFPE or HDPE geomembrane.	See Note 2	Reject Manufacturer
	Installer's Qualifications	Review of Certification	NA	1 per installer	Placed at least 2 million sf; personnel at least 1 million sf.	See Note 2	Reject Installer
	Resin	Review of Certification	NA	1 per product	Contains between 2 and 3 percent carbon black by weight, a specific gravity between 0.910 and 0.930, and a melt index less than 1.0 gram/10 minutes.	See Note 2	Reject Material
	Quality Control Certificates	Review of Certification	Specified Properties - Refer to Tech. Spec.	1 per product	Signed by the Manufacturer, include roll numbers, identification, and, at a minimum, the results of the following QC tests: thickness, tensile force per unit width and elongation at break, and tear resistance.	See Note 3	Reject Material
	Manufacturer's Warranty	Review of Certification	NA	1 per batch	Geomembrane will not develop cracks or holes from normal service for ten (10) years from delivery date, and the geomembrane is immune from chemical attack and degradation by chemicals specified in the Manufacturer's literature.	See Note 2	Reject Material
	Ozone Substances	Review of Certification	NA	1 per batch	No ozone depleting substances were used in the manufacture of the geomembrane.	See Note 2	Reject Material
	Extrusion Resin	Review of Certification	NA	1 per batch	Same material as sheet resin	See Note 2	Reject Material
	Textured Manufacture Method	Visual/Review of Certification	NA	1	Textured on both sides by coating at time of manufacture rather than etched construction; Uniform textured surface.	See Note 2	Reject Material
	Average Thickness	Review of Certification	ASTM D5199	1 per batch	≥40 mil	See Note 3	Reject Material

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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (cont'd)</b>							
	Thickness	Review of Certification	ASTM D5199	1 per batch	≥36 mil	See Note 3	Reject Material
	Specific Gravity	Review of Certification	ASTM D1505	1 per batch	0.910 to 0.935	See Note 3	Reject Material
	Carbon Black Dispersion	Review of Certification	ASTM D1603	1 per batch	A1, A2, or B1	See Note 3	Reject Material
	Melt Index	Review of Certification	ASTM D1238	1 per batch	<1.0 gm/10 min.	See Note 3	Reject Material
	Tensile Strength	Review of Certification	ASTM D638	1 per batch	≥150 ppi (smooth); ≥75 ppi (textured)	See Note 3	Reject Material
	Elongation	Review of Certification	ASTM D638	1 per batch	≥500% (smooth); ≥200% (textured)	See Note 3	Reject Material
	Low Temperature Brittleness	Review of Certification	ASTM D746	1 per batch	≤-90°F	See Note 3	Reject Material
	Tear Resistance	Review of Certification	ASTM D1004	1 per batch	≥20 lbs.	See Note 3	Reject Material
	Puncture Resistance	Review of Certification	FTM-STD 101 Method 2065	1 per batch	≥45 lbs.	See Note 3	Reject Material
	Dimensional Stability	Review of Certification	ASTM D1204 (1 hr. at 212°F)	1 per batch	≤3% at 1 hour at 212°F	See Note 3	Reject Material
<b>Gas Management Piping (02143)</b>							
PVC Plastic Pipe and Fittings	Type and Size of Pipe	Review of Literature	NA	1 per product	ASTM D1785, PVC 1120, Schedule 80	See Note 2	Reject Materials
	Type and Size of Fittings	Review of Literature	NA	1 per product	Solvent Welded Socket ASTM D2467, Schedule 80, or Threaded ASTM D2464	See Note 2	Reject Materials
	Solvent Cement	Review of Literature	NA	1 per product	ASTM D2564	See Note 2	Reject Materials

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Geotextiles (02272)</b>							
General	Manufacturer Method	Review of Certification	NA	1 per product	Continuous inspection for needles with permanent on-line full-width metal detectors.	See Note 2	Reject Material
	Material	Review of Literature	NA	1 per product	≥85% polyolefins, polyesters, or polyamides. Filaments retain dimensional stability relative to each other.	See Note 2	Reject Material
Non-Woven Cushion Material	Record Sample	NA	NA	1 per batch or 100,000 sf	36" x 12" sample	See Note 3	NA
	Weight	Review of Literature	ASTM D3776	1 per product	≥12 oz/sy	See Note 3	Reject Material
	Puncture Resistance	Review of Literature	ASTM D4833	1 per product	≥150 lbs.	See Note 3	Reject Material
	Grab Tensile Strength	Review of Literature	ASTM D4632	1 per product	≥275 lbs.	See Note 3	Reject Material
	Trapezoidal Tear Strength	Review of Literature	ASTM D4533	1 per product	≥110 lbs.	See Note 3	Reject Material
	Burst Strength	Review of Literature	ASTM D3786	1 per product	≥590 psi	See Note 3	Reject Material
Roadway Stabilization Fabric	Record Sample	NA	NA	1 per product	36" x 12" sample	See Note 2	NA
	Grab Tensile Strength	Review of Literature	ASTM D4632	1 per product	≥200 lbs.	See Note 3	Reject Material
	Puncture Resistance	Review of Literature	ASTM D4833	1 per product	≥80 lbs.	See Note 3	Reject Material
	Burst Strength	Review of Literature	ASTM D3786	1 per product	≥320 psi	See Note 3	Reject Material
	Trapezoidal Tear Strength	Review of Literature	ASTM D4533	1 per product	≥50 lbs.	See Note 3	Reject Material
	Seam Strength	Review of Literature	ASTM D4632	1 per product	≥180 lbs.	See Note 3	Reject Material
	UV Degradation	Review of Literature	ASTM D4355	1 per product	70% at 150 hrs.	See Note 3	Reject Material

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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Geotextiles (cont'd)</b>							
Roadway Stabilization Fabric (cont'd)	AOS	Review of Literature	ASTM D4715	1 per product	≤0.6 mm	See Note 3	Reject Material
	Permeability	Review of Literature	ASTM D4491	1 per product	≥1 x 10 <sup>-9</sup> cm/sec	See Note 3	Reject Material
Non-Woven Geotextile	Permittivity	Review of Literature	ASTM D4491	1 per product	≥0.05 sec	See Note 3	Reject Material
	AOS	Review of Literature	ASTM D4751	1 per product	≤0.43 mm	See Note 3	Reject Material
<b>Landfill Preparation/Excavation (02315)</b>							
Common/Select/Restricted Fill	Moisture Density	Standard Proctor	ASTM D698	1 per off-site borrow source; 1 per 200 feet along baseline on-site	None	See Note 1	NA
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source; 1 per 200 feet along baseline on-site	Classify GC, SW, SP, SM, SC, ML, CL	See Note 1	Reject Material
	Liquid Limit, Plastic Limit, Plasticity Index	Atterberg Limits Test	ASTM D4318	1 per off-site borrow source; 1 per 200 feet along baseline on-site	LL <50	See Note 1	Reject Material
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source; 1 per 200 feet along baseline on-site	Classify SW, SP, SM, SC, ML, CL	See Note 1	Reject Material
	Acid Production	Iron Sulfide Test	Rutgers Soil Testing Lab "Soil Test #6"	3 per borrow source (off-site) if suspected	Zero Iron Sulfide	See Note 1	Reject Material
<b>Bedding/Gas Management Layer (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per off-site borrow source	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source	Classify SP	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source	<10%	See Note 1	Reject Material

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Granular Drainage Material (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per off-site borrow source	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source	$D_{85} > 4D_{15}$	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source	$D_2 > 0.1$ inch	See Note 1	Reject Material
<b>Aggregate Base Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per off-site borrow source	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source	SHS NJDOT, Section 901 Table 901-2, Type 1-2	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source	0-7%	See Note 1	Reject Material
<b>Aggregate Surface Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per off-site borrow source	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source	SHS NJDOT, Section 901-08	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source	3-12%	See Note 1	Reject Material
<b>Riprap (02315)</b>							
	Gradation	Gradation Test	ASTM C136	1 per borrow source	Type I $D_{50} = 4$ inch Type II $D_{50} = 6$ inch	See Note 1	Reject Material
<b>Casing Pipe (02315)</b>							
	Type and Size of Pipe	Review of Literature	NA	1 per product	ASTM A139, Grade B, or ASTM A252, Grade 2	See Note 2	Reject Material

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Monitoring Wells (02524)</b>							
	Type and Size of Outer Casing	Review of Certification	NA	1 per product	ASTM A53, Grade A	See Note 2	Reject Material
	Type and Size of Well Casing	Review of Certification	NA	1 per product	ASTM D1785 and NSF STD 14, Schedule 40 PVC Pipe	See Note 2	Reject Material
	Cement Grout	Review of Certification	NA	1 per product	ASTM C150, Type I or II	See Note 2	Reject Material
<b>Sanitary Sewerage (02530)</b>							
	Type and Size of Pipe	Review of Literature	NA	1 per product	ASTM D3034, SDR 35, or ASTM F949	See Note 2	Reject Material
	Type of Joints and Gaskets	Review of Literature	NA	1 per product	ASTM D3212 (joints), ASTM F477 (gaskets)	See Note 2	Reject Materials
	Design Calculations for Holding Tank	Review of Design Criteria and P.E. Stamp	NA	1 per product	NJAC Title 7, Chapter 7:14A-23.5	See Note 2	Reject Design
	Type and Size of Frames and Covers	Review of Literature	NA	1 per product	FS RR-F-621 Figure 4, Size 22 (frame), Figure 12, Size 22 (cover)	See Note 2	Reject Material
<b>Electrical Manhole and Handhole (02582)</b>							
	Type of Manhole or Handhole	Review of Literature	NA	1 per product	ACI 318 and AASHTO HB14	See Note 2	Reject Material
	Type of Frame and Cover	Review of Literature	NA	1 per product	FS.RR-F-621	See Note 2	Reject Material
<b>Storm Drainage (02631)</b>							
	Type and Size of Piping	Review of Literature	NA	1 per product	Corrugated HDPE conforming to AASHTO M252 or AASHTO M294, Type S	See Note 2	Reject Material
<b>Bituminous Concrete Pavement (02741)</b>							
	Mix Design	Review of Mix Design Report	NA	1 per mix	SHS NJDOT Section 903, Paragraph 903.05, Type I-5	See Note 2	Reject Mix
	Producer Certificate	Review of Certificate	NA	1 per producer	Conformance with Tech. Spec.	See Note 2	Reject Material
	Laboratory Results	Review Results	NA	1 per mix	Less than 1 year old	See Note 2	Reject Material

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Turf (02921)</b>							
	Physical Characteristics of Fertilizer	Review of Literature	NA	1 per product	Rutgers University Soil Test Recommendations	See Note 2	Reject Material
	Type of Seed	Review of Certification	NA	1 per product	DOA FSA	See Note 2	Reject Material
	Topsoil Composition	Soil Test	DOA SSIR	1 per borrow source	NJDA SE & SC, Section 3.5.1	See Note 1	Modify Accordingly with Adjusters, Conditioners, and Fertilizers
	Acid Production	Iron Sulfide Test	Rutgers University "Soil Test #6"	1 per borrow source	Zero Iron Sulfide	See Note 1	Reject Material
<b>Wetlands, Shrubs, Plants, and Grass (02951)</b>							
	Plant Types, Quality, and Size	Review of Certifications	NA	1 per plant type	DOI List of Botanical Names, ANSI 260.1 and nursery grown within 500 miles of Colts Neck in USDOA Hardiness Zone 7	See Note 2	Reject Materials
<b>Cast-In-Place Concrete (03300)</b>							
	Mix Design	Review Mix Design	NA	1 per concrete strength and type	ASTM C94, Option A; 3,000 psi 28 day strength; Aggregate: ASTM C260, No. 67	See Note 2	Reject Mix
	Curing Compound	Review of Literature	NA	1 per product	ASTM C309, white-pigmented, Type 2	See Note 2	Reject Material
	Grout	Review of Literature	NA	1 per product	ASTM C1107	See Note 2	Reject Material
<b>Overhead Transmission and Distribution (16301)</b>							
	Tested Transformer Losses	Review of Certification	NA	1 per product	NEMA Class 1 efficiency at full and one-half load	See Note 3	Reject Transformer
	Transformer Size and Type	Review of Literature	NA	1 per product	ANSI C57.12.20	See Note 2	Reject Transformer
	Overhead-type Distribution Transformer Routine	Review of Test Reports	NA	1 per product	ANSI/IEEE C57.12.00 ANSI/IEEE C57.12.90	See Note 3	Reject Transformer

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Service and Distribution (16400)</b>							
	Panelboard	Review of Literature and Drawing	NA	1 per product	UL 67, UL 50	See Note 2	Reject Material
	Disconnect Switches	Review of Literature	NA	1 per product	NEMA ICS 1	See Note 2	Reject Materials
<b>Underground Electrical Work - Low Voltage (16403)</b>							
	Wires and Cables	Review of Literature	NA	1 per product	UL 83 THWN (conductors), "W" type, $\geq$ No. 12 AWG (wires), Manufactured within last 12 months.	See Note 2	Reject Materials
	Conduit	Review of Literature	NA	1 per product	UL 6 (rigid galvanized), NEMA RN 1 (PVC coated), UL 1242 (intermediate galvanized)  NEMA TC 2, Type EPC-40-PVC (plastic)  NEMA TC 8, ASTM F512, Type EB-35 (plastic ducts)	See Note 2	Reject Materials
	Conduit Fittings	Review of Literature	NA	1 per product	UL 514A and UL 514B (metal)  NEMA TC 3 (PVC)	See Note 2	Reject Materials
	Ground Rods	Review of Literature	NA	1 per product	$\geq 3/4$ " diameter, 10' long (rod), $\geq$ No. 4 AWG (wire)	See Note 2	Reject Materials
<b>Exterior Lighting (16524)</b>							
	Lighting Fixtures	Review of Literature	NA	1 per product	ANSI C136.14 or UL 1572	See Note 2	Reject Materials
	Contactors	Review of Literature	NA	1 per product	NEMA ICS 2	See Note 2	Reject Material
	Photocell Switch	Review of Literature	NA	1 per product	UL 773 or UL 773A	See Note 2	Reject Material

Note 1: SQCR to perform test, provide results to QC Manager prior to delivery of material.

Note 2: SQCR to prepare or provide document, provide to QC Manager prior to delivery of material.

Note 3: Manufacturer to perform test, provide results to SQCR, who provides results to QC Manager prior to delivery of material.

TABLE 3-2

**SUMMARY OF CONSTRUCTION CONFORMANCE SQCR TESTING/INSPECTION  
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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (02142)</b>							
	Record Sample	NA	NA	1 per 100,000 sf	36" x 12" sample	See Note 2	NA
	Subbase Acceptability	Review of Certification	NA	1 per area	Written statement from RAC that subgrade is acceptable for geomembrane placement.	See Note 2	Rework Subbase
	Quality Control Certificates	Review of Certification	Specified Properties - Refer to Tech. Spec.	1 per every 2 rolls of geomembrane	Signed by the Manufacturer, include roll numbers, identification, and, at a minimum, the results of the following QC tests: thickness, tensile force per unit width and elongation at break, and tear resistance.	See Note 3	Reject Material
	Test Seams - Shear Strength	Field Tensiometer Test	ASTM D4437	Beginning of each seaming period, every 4 hours thereafter, and 1 per 500 feet of seam, minimum.	8 feet long (wedge), 3 feet long (extrusion), at beginning of each seaming period, every 4 hours thereafter.	See Note 2	Produce Test Seams
	Test Seams - Peel Strength	Field Tensiometer Test	ASTM D4437	Beginning of each seaming period, every 4 hours thereafter, and 1 per 500 feet of seam, minimum.	8 feet long (wedge), 3 feet long (extrusion), at beginning of each seaming period, every 4 hours thereafter.	See Note 2	Produce Test Seams
	Shear Strength	Shear Test	ASTM D413	1 per 500 feet of seam, minimum	30 ppi, minimum	See Note 2	Adjustment or Replacement, Repair Seams
	Peel Strength	Peel Test	ASTM D3083	1 per 500 feet of seam, minimum	30 ppi, minimum Film Tear Bond	See Note 2	Adjustment or Replacement, Repair Seams
	Non-destruct Testing of Seams	Vacuum Box	NA	100%	Air Tight	See Note 1	Repair Seam, Retest
	Roll Labeling	Visual	NA	100%	All rolls with Manufacturer's Name, Batch No., Dimensions, Roll No., Date of Fabrication, Directions for Unrolling and Unfolding.	See Note 1	Obtain Label Information
	Roll Storage	Visual	NA	100%	Wrapped to protect against ultraviolet light and water.	See Note 1	Repair/Replace Wrapping
	Transportation and Handling	Visual	NA	Random	Rolls protected and dry, handling equipment not pose damage, handle with care.	See Note 1	Protect, Cover, and Use Safe Equipment
	Surface of Geomembrane	Visual	NA	100%	Surface free of flaws or damage.	See Note 1	Remove Reject if Severe; Repair if Minor

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**SUMMARY OF CONSTRUCTION CONFORMANCE SQCR TESTING/INSPECTION  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (cont'd)</b>							
	Storage	Visual	NA	100%	Location provides adequate protection from puncture, is free of standing water, maximum 5 rolls in height, rolls or pallets secured.	See Note 1	Correct Storage Area
	Folds or Fishmouths	Visual	NA	100%	None	See Note 1	Repair Geomembrane
	Placement	Visual	NA	100%	Placed only in presence of QC Specialist. 40 hours notice to Contracting Officer required.	See Note 2	Halt Work
	Amount Placed	Visual	NA	100%	Limited to amount that can be anchored, ballasted, and seamed in 1 day; cannot be uncovered for more than 10 days.	See Note 1	Reject Installation
	Equipment	Visual	NA	100%	Any equipment used does not damage the geomembrane by handling, trafficking, or other means. No vehicular traffic shall be operated directly on the geomembrane.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Equipment	Visual	NA	100%	The geomembrane in trafficked areas shall be protected by a minimum of the cushion fabric overlaid by 12" of material meeting the gradation of the drainage layer.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Personnel	Visual	NA	100%	All personnel working on the geomembrane shall not smoke, wear damaging shoes, or engage in other activities which could damage the geomembrane.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Methods	Visual	NA	100%	The method used to unroll the geomembranes shall not cause scratching, folds, or crimps in the geomembrane and shall not rut the supporting soil.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Ballasting	Visual	NA	100%	Adequate ballasting shall be placed to prevent uplift by wind and creep without damaging the geomembrane.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Seam Layout	Visual	NA	100%	Oriented parallel to line of maximum slope, no T-shaped closer than 5 feet to toe of slope.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Seam Overlap	Measurement	NA	100%	4 inches minimum (wedge), 3 inches minimum (extrusion).	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
	Weather	Visual	NA	Daily	Placement only permitted between 40 and 100°F, periods of no precipitation, no excessive moisture (fog or dew), no excessive winds, no frozen soil.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage

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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (cont'd)</b>							
	Pipe Boots	Visual	NA	100%	Manufacturer's Standard, same base material, 4 inch neoprene and 4 inch stainless.	See Note 1	Correct Nonconformance, Inspect Work, Reject/Repair Damage
<b>Gas Management Piping (02143)</b>							
	Location of Pipes, Vents, Blind Flange	Measurements	Survey	100%	Within 3 feet of contract documents.	See Note 1	Reposition
	Joint Assembly	Visual	NA	Random	ASTM D2855	See Note 1	Reassemble Joint
<b>Geotextiles (02272)</b>							
All Geotextiles	Record Sample	NA	NA	1 per 100,000 sf	36" x 12" sample	See Note 2	NA
	Protective Wrapping	Visual	NA	100%	The Installer shall remove the protective wrappings from the geotextile rolls to be deployed only after the substrate layer, soil, or other geosynthetic has been documented and approved by the SQCR.	See Note 1	Correct Nonconformance
	Protection of Underlying Layers	Visual	NA	100%	The Installer shall take the necessary precautions to protect the underlying layers upon which the geotextile will be laid. if the substrate is soil, care should be taken to avoid rutting of the soil.	See Note 1	Correct Nonconformance
	Substrate	Visual	NA	100%	If the substrate is comprised of geosynthetic materials, the geotextile will be deployed by hand by use of small jack lifts on pneumatic tires having low ground contact pressure, or by use of all-terrain vehicles (ATVs) having low ground contact pressure (<5.0 psi).	See Note 1	Correct Nonconformance
	Trapped Material	Visual	NA	100%	During placement, care must be taken to avoid trapping stones, excessive dust, or moisture that could damage the geomembrane.	See Note 1	Correct Nonconformance
	Anchoring	Visual	NA	100%	On sideslopes the geotextiles should be anchored at the top and then unrolled so as to the geotextile free of wrinkles and folds.	See Note 1	Correct Nonconformance
	Ballast	Visual	NA	100%	The geotextile should be weighted with sandbags, or the equivalent, to provide resistance against wind uplift.	See Note 1	Correct Nonconformance

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Geotextiles (cont'd)</b>							
	Harmful Objects	Visual	NA	100%	A visual examination of the geotextile should be carried out to ensure that no potentially harmful objects are present such as stones, sharp objects, small tools, sandbags, etc.	See Note 1	Correct Nonconformance
	Exposure	Visual	NA	100%	Prolonged exposure to sunlight will not be allowed.	See Note 1	Correct Nonconformance
	Exposure	Visual	NA	100%	Deployed geotextile will not be exposed more than 14 days without cover.	See Note 1	Correct Nonconformance
	Weather	Visual	NA	100%	Geotextile should not be exposure to precipitation or temperatures >140°F prior to being installed.	See Note 1	Correct Nonconformance
	Locations	Visual	NA	100%	Geotextile should be placed at the locations indicated.	See Note 1	Correct Nonconformance
	Defects	Visual	NA	100%	All defective geotextile (i.e., holes, rips, flaws, deterioration, or damage) material will be rejected and removed from the site to avoid use.	See Note 1	Correct Nonconformance
	Orientation	Visual	NA	100%	On slopes >5H:1V, the long dimension of the roll will be placed parallel to the slope.	See Note 1	Correct Nonconformance
	Wrinkles	Visual	NA	100%	All material will be laid flat and without incurring tensino, stress, wrinkles, folds, or creases in the material.	See Note 1	Correct Nonconformance
	Seams	Visual	NA	100%	The geotextile panels will be joined by overalapping seams (minimum 12"). On slopes >4H:1V, seams shall be continuously sewn using a "prayer" seam with one row of a two thread chain stitch (minimum 3" from stitch line to edge of geotextile).	See Note 1	Correct Nonconformance
	Overlap	Visual	NA	100%	Overlap joints shall be measured as a single layer of cloth.	See Note 1	Correct Nonconformance
	Repairs	Visual	NA	100%	Patch to extend a minimum of 12" beyond edge of damage and be sewn.	See Note 1	Correct Nonconformance
	Shingle	Visual	NA	100%	The panels shall be placed so that the pugrade gabric overlaps the downgrade fabric.	See Note 1	Correct Nonconformance

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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Landfill Preparation/Excavation (02315)</b>							
Common/ Select/ Restricted Fill	Gradation	Gradation Test	ASTM C136	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Liquid Limit, Plastic Limit, Plasticity Index	Atterberg Limits Test	ASTM D4318	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487 and LL $\leq$ 50.	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Moisture/Density	Standard Proctor Test	ASTM D698	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	None	See Note 1	NA
	Field Density/Moisture	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	90% of ASTM D698 (general site) 95% of ASTM D698 (under slabs and paved areas)	See Note 1	Recompact
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922/3017	$\pm$ 5%	See Note 1	Change or Recalibrate Densometer
	Proof Rolling	Visual	NA	100% on waste material	6 passes with 15 ton roller between 2 1/4 to 3 1/2 mph	See Note 1	Complete Proof Rolling
	Grades and Elevation	Survey	NA	50 ft offsets, 50 ft intervals along baseline	Within 0.5 feet	See As Built	Regrade Area
	Lift Thickness	Visual and Measure- ment at Density Tests Locations	NA	Random	12" maximum	See Note 1	Remove and Recompact
	Material Separation	Visual	NA	100%	Separate Landfill Material as: a. Any dimension >3 feet b. Any dimension between 6" and 3 feet c. All dimensions <6" d. Ordnance Materials e. Intact Drums	See Note 2	a. Dispose of as directed under Landfill Cap; b. Use as Com- mon Fill in 12" lifts; c. Use as Common Fill; d. Contact EOD and ROICC; e. Over-pack and Stockpile
<b>Bedding/Gas Management Layer (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM .D4253/4254	1 per 5,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 2,000 cy or borrow source change	Classify SP	See Note 1	Reject Material

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 LANDFILL SITES 4 AND 5 REMEDIAL ACTION  
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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Landfill Preparation/Excavation (02315)</b>							
Common/Select/Restricted Fill	Gradation	Gradation Test	ASTM C136	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/Select/Restricted, as Appropriate
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/Select/Restricted, as Appropriate
	Liquid Limit, Plastic Limit, Plasticity Index	Atterberg Limits Test	ASTM D4318	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	Classify according to ASTM D2487 and LL ≤50.	See Note 1	Use as Common/Select/Restricted, as Appropriate
	Moisture/Density	Standard Proctor Test	ASTM D698	1 test per 2,000 cy or source change (off-site) 1 test per 200 ft along baseline (on-site)	None	See Note 1	NA
	Field Density/Moisture	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	90% of ASTM D698 (general site) 95% of ASTM D698 (under slabs and paved areas)	See Note 1	Recompact
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922/3017	±5%	See Note 1	Change or Recalibrate Densometer
	Proof Rolling	Visual	NA	100% on waste material	6 passes with 15 ton roller between 2½ to 3½ mph	See Note 1	Complete Proof Rolling
	Grades and Elevation	Survey	NA	50 ft offsets, 50 ft intervals along baseline	Within 0.5 feet	See As Builts	Regrade Area
	Lift Thickness	Visual and Measurement at Density Tests Locations	NA	Random	12" maximum	See Note 1	Remove and Recompact
	Material Separation	Visual	NA	100%	Separate Landfill Material as: a. Any dimension >3 feet b. Any dimension between 6" and 3 feet c. All dimensions <6" d. Ordnance Materials e. Intact Drums	See Note 2	a. Dispose of as directed under Landfill Cap; b. Use as Common Fill in 12' lifts; c. Use as Common Fill; d. Contact EOD and ROICC; e. Over-pack and Stockpile
<b>Bedding/Gas Management Layer (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 5,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 2,000 cy or borrow source change	Classify SP	See Note 1	Reject Material

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**SUMMARY OF CONSTRUCTION CONFORMANCE SQCR TESTING/INSPECTION  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Bedding/Gas Management Layer (cont'd)</b>							
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 2,000 cy or borrow source change	<10%	See Note 1	Reject Material
	Field Density	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	60% of Relative Density	See Note 1	Recompact
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922	±5%	See Note 1	Change or Recalibrate Densometer
	Lift Thickness	Visual and Measurement at Density Test Locations	NA	Random	12" ± 1"	See Note 1	Rework Layer
<b>Granular Drainage Material (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 2,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 2,000 cy or borrow source change	D <sub>85</sub> > 4D <sub>15</sub>	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 2,000 cy or borrow source change	D <sub>2</sub> > 0.1 inch	See Note 1	Reject Material
	Field Density	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	70% of Relative Density	See Note 1	Recompact
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922	±5%	See Note 1	Change or Recalibrate Densometer
	Lift Thickness	Visual and Measurement at Density Test Locations	NA	Random	12" ± 1"	See Note 1	Rework Layer
<b>Aggregate Base Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 2,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 2,000 cy or borrow source change	SHS NJDOT, Section 901 Table 901-2, Type 1-2	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 2,000 cy or borrow source change	0-7%	See Note 1	Reject Material
	Field Density	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	70% or Relative Density	See Note 1	Recompact

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**SUMMARY OF CONSTRUCTION CONFORMANCE SQCR TESTING/INSPECTION  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Aggregate Base Course (cont'd)</b>							
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922	±5%	See Note 1	Change or Recalibrate Densometer
	Lift Thickness	Visual and Measure- ment at Density Test Locations	NA	Random	10" ± 1"	See Note 1	Rework Layer
<b>Aggregate Surface Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per off-site borrow source	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per off-site borrow source	SHS NJDOT, Section 901-08	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per off-site borrow source	3-12%	See Note 1	Reject Material
	Field Density	Nuclear Densometer	ASTM D2922/3017	1 per 10,000 sf per lift	70% or Relative Density	See Note 1	Recompact
	Density Verification	Sand Cone	ASTM D1556	1 per 10 ASTM D2922	±5%	See Note 1	Change or Recalibrate Densometer
	Lift Thickness	Visual and Measure- ment at Density Test Locations	NA	Random	6" ± 1"	See Note 1	Rework Layer
	Grades and Elevation	Survey	NA	50 ft offsets 50 ft intervals along baseline	Within 0.5 feet	See As Built	Regrade Areas
<b>Riprap (02315)</b>							
	Gradation	Gradation Test	ASTM C136	1 per 2,000 cy or borrow source change	Type I D <sub>50</sub> = 4 inch Type II D <sub>50</sub> = 6 inch	See Note 1	Reject Material
	Grades and Elevation	Survey	NA	50 ft intervals	Within 0.5 feet	See As Built	Regrade
<b>Pipe Bedding (02315)</b>							
	Compaction	Nuclear Densometer	ASTM D2922	1 per 200 linear ft per lift	95% of ASTM D698	See Note 1	Recompact

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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Monitoring Wells (02524)</b>							
	Well Abandonment	Visual	EPA 650/4-89/034	100%	Grout borehole annulus, allow to settle, add additional grout.	NJAC Title 7, Chapter 7:26E	RegROUT
	Well Extension	Visual	NA	100%	Match Existing Casing and Riser	See Note 1	Correct Weld and/or Collar
	Location/Elevation	Survey	NA	100%	Elevations on Drawings	See As Builts	Correct Elevation
<b>Sanitary Sewerage (02530)</b>							
	Joint Assembly	Visual	NA	100%	ASTM D2321	See Note 1	Reassemble Joint/Gasket
	Grade and Elevation	Survey	NA	100%	Lines and Grades on Drawings	See As Builts	Relay Pipe
<b>Electrical Manhole and Handhole (02582)</b>							
	Installation	Visual	NA	100%	NFPA 70 and ANSI C2	See Note 1	Correct Position and Assembly
<b>Storm Drainage (02631)</b>							
	Grade and Elevation	Survey	NA	100%	Lines and Grades on Drawings	See As Builts	Relay Pipe
<b>Bituminous Concrete Pavement (02741)</b>							
	Mix	Extraction Test	ASTM D2172	2 per day per mix type at plant or from truck	SHS NJDOT Section 903, para 05 Type I-5	See Note 2	Reject Materials, Cease Operations, New Trial Batch
	Gradation	Sieve Analysis	AASHTO T30	2 per day per mix type at plant or from truck	SHS NJDOT Section 903, para 05 Type I-5	See Note 2	Reject Materials, Cease Operations, New Trial Batch
	Stability and Flow	Stability and Flow Test	ASTM D1559	2 per day per mix type at plant or from truck	SHS NJDOT Section 903, para 05 Type I-5	See Note 2	Reject Materials, Cease Operations, New Trial Batch
	Pavement Density	Nuclear Densometer	ASTM D2950	1 per 10,000 sf	SHS NJDOT Section 404, paras 01-16	See Note 2	Recompact
	Pavement Thickness	Formula	Tech. Spec.	1 per 10,000 sf	2 inches	See Note 2	Rework Layer
	Grade and Elevation	Survey	NA	50 ft offsets 50 ft intervals along baseline	Within 0.5 feet of grades on Drawings	See As Builts	Regrade

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**SUMMARY OF CONSTRUCTION CONFORMANCE SQCR TESTING/INSPECTION  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Turf (02921)</b>							
	Subgrade Preparation	Visual	NA	100%	Track with Dozer	See Note 1	Rework Surface
	Fertilizers, pH Adjusters, Soil Conditions	Review of Application Rates	NA	100%	NJDA SE&SC, Section 3.5.1	See Note 2	Modify Rate of Application
	Grade and Elevation	Survey	NA	50 ft offsets 50 ft intervals along baseline	Design contours on Drawings within 0.5 ft	See As Built	Regrade Layer
	Seeding	Review of Mix	NA	100%	Proportions listed on Drawing C-2	See Note 2	Reject Materials
<b>Wetlands, Shrubs, Plants, and Grass (02951)</b>							
	Wetlands Restoration	Visual	NA	100%	Plants, Seed, and Fertilizer listed on Drawing C-9	See Note 2	Reject Planting
<b>Cast-in-Place Concrete (03300)</b>							
	Slump	Measurement	ASTM C143	Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch or every 10 cy of concrete.	2-4 inches	See Note 1	Reject Material
	Temperature	Measurement	NA	Perform tests in hot or cold weather conditions for each batch or every 10 cy of concrete and whenever test cylinders and slump tests are made.	Below 50°F and above 80°F	See Note 1	NA
	Compressive Strength	Measurement	ASTM C39/C31/C42	Samples shall be taken not less than once a day, nor less than once for each 100 cy of concrete, nor less than one for each 5,000 sf of surface area.	3,000 psi	See Note 1	Remove and Replace with New Material
	Air Content	Measurement	ASTM C173/C231	Same frequency as specified for slump tests.	4-6%	See Note 1	Reject Material

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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Overhead Transmission and Distribution (16301)</b>							
	Transformer	Visual, Mechanical, and Electrical	NA	100%	NFPA 70B, NETA ATS	See Note 2	Reject Transformer
	Grounding System	Visual, Mechanical, and Electrical	NA	100%	ANSI C2	See Note 2	Reject System
<b>Service and Distribution (16400)</b>							
	Panelboard, Switches	Visual, Mechanical, and Electrical	NA	100%	NFPA 70, ANSI C2	See Note 2	Reject System
	System Layout	Review of Diagram	NA	100%	Single Line Diagram	See As Built	Reject System
<b>Underground Electrical Work - Low Voltage (16403)</b>							
	Installation	Cable Test	NA	100%	Apply 500 volts to provide 250,000 ohms minimum resistance.	See Note 2	Reject Installation
<b>Exterior Lighting (16524)</b>							
	Installation	Operational Test	NA	100%	ANSI C2, NFPA 70	See Note 2	Reject Installation

Note 1: SQCR to perform test/inspection.

Note 2: SQCR to perform test/inspection, provide results to QC Manager prior to delivery of material.

Note 3: Manufacturer to perform test, provide results to SQCR, who provides results to QC Manager prior to delivery of material.

#### **4.0 QC MANAGER TESTING/INSPECTION ACTIVITIES**

To assure accuracy and consistency of test results generated by the testing activities of the SQCR, the QC Manager will duplicate tests as described in Table 4-1 and utilize separate laboratory facilities.

The purpose of this section is to outline the testing/inspections to be performed by the QC Manager. As appropriate, the key property, inspection method, test method reference, frequency of testing, specification, and response to a failed test or inspection is provided. The materials referenced herein are those described in the Construction Drawings and Technical Specifications of the November 1997 Final (100%) Design Document prepared by B&R Environmental for the Landfill Sites 4 and 5 at Naval Weapons Station Earle.

See Table 4-1 for a summary of the QC Manager testing/inspection activities.

**TABLE 4-1**  
**SUMMARY OF QC MANAGER INSPECTION**  
**LANDFILL SITES 4 AND 5 REMEDIAL ACTION**  
**NAVAL WEAPONS STATION EARLE, COLTS NECK, NEW JERSEY**  
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Component/Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Smooth and Textured VFPE (02142)</b>							
	Record Sample	NA	NA	1 per 100,000 sf	36" x 12" sample	See Note 1	NA
	Quality Control Certificates	Review of Certification	Specified Properties - Refer to Tech Spec.	1 per every 2 rolls of geomembrane	Signed by the Manufacturer, include roll numbers, identification, and, at a minimum, the results of the following QC tests: thickness, tensile force per unit width and elongation at break, and tear resistance.	See Note 1	Reject Material
	Shear Strength	Shear Test	ASTM D413	1 per 5,000 ft of seam, minimum	30 ppi, minimum	See Note 1	Welding Device Adjustment or Replacement, Repair Seams
	Peel Strength	Peel Test	ASTM D3083	1 per 5,000 ft of seam, minimum	30 ppi, minimum	See Note 1	Welding Device Adjustment or Replacement, Repair Seams
	Average Thickness	Thickness Test	ASTM D751 (Modified)	1 per 20 rolls	≥40 mil	See Note 1	
	Thickness	Thickness Test	ASTM D751 (Modified)	1 per 20 rolls	≥36 mil	See Note 1	
	Specific Gravity	Specific Gravity Test	ASTM D1505	1 per 20 rolls	0.910 to 0.930	See Note 1	
<b>Geotextiles (02272)</b>							
All Geotextiles	Record Sample	NA	NA	1 per 100,000 sf	36" x 12" sample	See Note 1	NA
Non-Woven Cushion Material	Weight	Review of Certification	ASTM D3776	1 per 200,00 sf	≥12 oz/sy	See Note 1	Reject Material
Non-Woven Geotextile	Permittivity	Review of Certification	ASTM D4491	1 per 200,000 sf	≥0.05 seconds	See Note 1	Reject Material
Roadway Stabilization Fabric	Tensile Strength	Review of Certification	ASTM D4632	1 per 200,000 sf	≥200 lbs.	See Note 1	Reject Material

TABLE 4-1

**SUMMARY OF QC MANAGER INSPECTION  
LANDFILL SITES 4 AND 5 REMEDIAL ACTION  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Landfill Preparation/Excavation (02315)</b>							
Common/ Select/ Restricted Fill	Gradation	Gradation Test	ASTM C136	1 test per 10,000 cy or source change (off-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 test per 10,000 cy or source change (off-site)	Classify according to ASTM D2487.	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Liquid Limit, Plastic Limit, Plasticity Index	Atterberg Limits Test	ASTM D4318	1 test per 10,000 cy or source change (off-site)	Classify according to ASTM D2487 and LL $\leq 50$ .	See Note 1	Use as Common/ Select/Restricted, as Appropriate
	Moisture/Density	Standard Proctor Test	ASTM D698	1 test per 10,000 cy or source change (off-site)	None	See Note 1	NA
	Lift Thickness	Visual	NA	Random	12' maximum	See Note 1	Remove and Recompact
<b>Bedding/Gas Management Layer (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 10,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 10,000 cy or borrow source change	Classify SP	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 10,000 cy or borrow source change	<10%	See Note 1	Reject Material
	Lift Thickness	Visual	NA	Random	12" $\pm$ 1"	See Note 1	Rework Layer
<b>Granular Drainage Material (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 10,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 10,000 cy or borrow source change	$D_{85} > 4D_{15}$	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 10,000 cy or borrow source change	$D_2 > 0.1$ inch	See Note 1	Reject Material
	Lift Thickness	Visual	NA	Random	12" $\pm$ 1"	See Note 1	Rework Layer

TABLE 4-1

SUMMARY OF QC MANAGER INSPECTION  
 LANDFILL SITES 4 AND 5 REMEDIAL ACTION  
 NAVAL WEAPONS STATION EARLE, COLTS NECK, NEW JERSEY  
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Component/ Element	Key Property	Inspection Method	Test Method Reference	Frequency of Testing	Specification	Procedure for Submittal	Response to Failed Inspection/Test
<b>Aggregate Base Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 10,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 10,000 cy or borrow source change	SHS NJDOT, Section 901 Table 901-2, Type I-2	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 10,000 cy or borrow source change	0-7%	See Note 1	Reject Material
	Lift Thickness	Visual	NA	Random	10" ± 1"	See Note 1	Rework Layer
<b>Aggregate Surface Course (02315)</b>							
	Maximum/Minimum Density	Relative Density Test	ASTM D4253/4254	1 per 10,000 cy or borrow source change	None	See Note 1	NA
	Gradation	Sieve Analysis	ASTM C136	1 per 10,000 cy or borrow source change	SHS NJDOT, Section 901-08	See Note 1	Reject Material
	Percent Passing No. 200 Sieve	Wet Sieve Analysis	ASTM D1140	1 per 10,000 cy or borrow source change	3-12%	See Note 1	Reject Material
	Lift Thickness	Visual	NA	Random	6" ± 1"	See Note 1	Rework Layer
<b>Turf (02921)</b>							
	Type of Seed	Review of Certification	NA	1 per product	DOA FSA	See Note 1	Reject Material
	Topsoil Composition	Review of Test Results	DOA SSIR	1 per borrow source	NJDA SE & SC, Section 3.5.1	See Note 1	Modify Accordingly with Adjusters, Conditioners, and Fertilizers

Note 1: QC Manager to perform test/inspection.

## **5.0 DOCUMENTATION**

The CQC Plan provides a mechanism to document the construction activities. These documents are utilized by the Construction NTR, Design NTR, Certifying Engineer, QC Manager, and others (i.e., USEPA, NJDEP) to review the adequacy of construction.

### **5.1 Daily Reports**

A Daily Report will be prepared by the RAC's SQCR. This report will provide the chronological framework for identifying and recording all other reports. The Daily Reports will include the following information:

- Date, project name, location, and other identification.
- Description of weather conditions, including temperature, cloud cover, and precipitation.
- A summary of any meetings held and actions recommended or taken.
- Description and location of construction activities.
- Equipment and personnel working on-site including all subcontractors.
- Description of off-site materials received, including any quality verification documentation.
- Calibrations, or recalibrations, of test equipment, including actions taken as a result of recalibration (when applicable).
- Decisions made regarding approval of units of material or of work, and/or corrective actions to be taken in instances of substandard quality.
- Unique identifying sheet numbers of inspection data sheets and/or problem reporting and corrective measures reports used to substantiate the decisions described in the preceding item.
- Signature of the RAC's SQCR.

The Daily Reports will be submitted by the RAC's SQCR to the Construction NTR.

### **5.2 Inspection And Testing Reports**

Inspection and Testing Reports will be prepared by the RAC's SQCR and the QC Manager for their respective inspection and field testing activities. The CQC Inspection and Testing Reports will include the following information:

- Description or title of the inspection activity.
- Date of the inspection and/or testing and personnel involved in the inspection besides the individual preparing the data sheet.

- Location of the inspection activity or action from which a sample was obtained for testing.
- Type of inspection activity and procedure used (reference to standard method when appropriate, such as ASTM, etc.).
- Unique identifying geomembrane sheet number for cross referencing and document control.
- Recorded observation or test data.
- Results of the inspection activity (e.g., pass/fail). Comparison with design requirements.
- Signature of the SQCR and the person performing the reported inspection and/or test, if other than the SQCR.

### **5.3 Weekly Summary Reports**

A Weekly Summary Report will be prepared by the QC Manager summarizing the results of all inspections, QC activities and corrective actions. The Weekly Summary Report will be reviewed and signed by the Certifying Engineer and include the following information:

- Decisions made regarding approval of materials or of work.
- Corrective actions to be taken in instances of substandard or suspect quality.
- CQC test results in support of determination of substandard quality.
- Details and reason for delays that pertain to CQC experienced by the RAC (e.g., RAC, Government, weather, etc.).
- Log and status of and comments on the submittals, RFIs and FCRs received from the RAC.

### **5.4 Problem Identification and Corrective Measures Documents**

A problem is defined as a material or workmanship that does not meet the design criteria, Construction Drawings, and/or Technical Specifications. For each problem a Problem Identification and Corrective Measures document will be prepared and cross-referenced to the specific Daily Report and Weekly Summary Report where the problem was first identified. The Problem Identification and Corrective Measures document will include the following information, as applicable:

- A description of the problem.
- The location of the problem.
- The probable cause of the problem.
- A description of how and when the problem was located.
- An estimate of how long the problem existed.
- Suggested corrective measure(s).
- A documentation of the implementation of the corrective measure(s).
- A description of the final results of the corrective measure(s).
- Suggested methods to prevent similar problems.
- Signature of the QC Manager.
- Signature of the Certifying Engineer.

In certain cases, not all of the above information will be available or applicable. The QC Manager and Certifying Engineer will be aware of any significant recurring problems, determine the cause of the problem, and recommend appropriate changes to prevent recurrence. When this type of evaluation is made, the results will be documented in a brief report to the Construction NTR containing the supporting Problem Identification and Corrective Measures document.

#### 5.4.1 Control of Discrepant and Non-conforming Items

This section describes the procedure for controlling discrepant and non-conforming items.

Discrepant items are those found during inspection to be incomplete, but are correctable by further prescribed processing.

Non-conforming items are those that have been completed, inspected, and accepted, but are subsequently found to deviate from the design documents.

##### 5.4.1.1 Discrepant Items

Items that have been inspected and found in accordance with the design documents are classified as acceptable. Engineering changes that make it necessary to alter these acceptable items by further field action are classified as new work and subject to the same QC requirements as was the original work.

Incomplete items that are discovered during field activities to be discrepant, but which are correctable by further prescribed processing are controlled and documented by the use of Rework Item List (see Appendix A) prepared and maintained by the SQCR and QC Manager. These punch lists describe the discrepancy which must be corrected before the item is completed, inspected, and accepted. Discrepant items that are corrected within the same shift as discovered need not be punch listed, but are reported in the Daily Report.

##### 5.4.1.2 Non-conforming Items

Non-conforming items are controlled and documented by the use of a Non-conformance Report. Nonconformance Reports are prepared as shown by the sample attached in Appendix A.

The verification of corrective actions taken in accordance with the Non-conformance Reports is the responsibility of the SQCR and QC Manager.

The Non-conformance Report is accurately and concisely written by the SQCR after consultation with the interested parties to ensure that the nonconforming item is correctly described, the appropriate program criteria referenced, and sufficient data provided to facilitate proper and complete dispositions to resolve the non-conformity. The QC Manager then validates the Non-Conformance Report and transmits it for review by the Certifying Engineer. Upon receiving the Certifying Engineer's written concurrence, the QC Manager submits the Non-Conformance Report to the Construction NTR and the Design NTR.

Each Non-Conformance Report is given a disposition by the Certifying Engineer and/or the Construction NTR and Design NTR, which is the action required to correct or resolve the non-conformance.

Non-Conformance Reports are dispositioned in one of the following four ways:

- "Rework", which is the action by which a non-conforming item is processed to make it conform to the requirements of the design documents.
- "Repair", which is the action to make a non-conforming item perform its intended use but not necessarily meet all the requirements of the design documents.
- "Reject", which is the action taken to eliminate a non-conforming item from its specified use and replace it with conforming material.
- "Use-As-Is", which is the action taken by the Certifying Engineer to accept an otherwise non-conforming item.

The QC Manager is authorized to make "Rework" and "Reject" dispositions. "Repair" and "Use-As-Is" dispositions are obtained from the Certifying Engineer by means of a Non-Conformance Report. Approval from USEPA and NJDEP is also required for all "Repair" and "Use-As-Is" dispositions.

Upon completion of "Rework" and "Reject" dispositions, the QC Manager makes a re-inspection to determine acceptability.

If the item is found acceptable as the result of the re-inspection, the QC Manager who performed the re-inspection documents his acceptance by signing and dating the Non-Conformance Report.

If the item is found unacceptable during the re-inspection, the SQCR signs, dates and reprocesses the Non-Conformance Report.

If the final disposition is "Reject", the SQCR and QC Manager sign and dates the Non-Conformance Report after ensuring that adequate measures have been taken to prevent the inadvertent use of an unacceptable item.

Information copies of each completed Non-Conformance Report are sent to the Certifying Engineer. Distribution of the Non-Conformance Report is shown on the report.

## **5.5 Documentation And Records Control**

A records management system will be established and implemented to ensure that project documents such as correspondence, procedures, Construction Drawings, Technical Specifications, contract documents, changes to documents, and inspection records will be controlled. The records management system will identify and/or include:

- The documents to be controlled,
- An index and filing method,
- Control logs to identify the document, its subject, identification number, and revision status, if applicable,

- An Action Item List referencing appropriate collateral documents and including provisions for tracking status, and closeout of action items, and
- The responsibility for preparing, reviewing, approving, and issuing documents.

A set of all QC Management and CQC documentation will be kept by the QC Manager and SQCR, respectively, at all times. Records will be retained for the duration of the job then turned over to Northdiv for retention for the minimum of six (6) years as required by USEPA.

## **5.6 Final Report**

At the completion of the project, the Certifying Engineer will submit a Final Report to the Construction NTR. The Final Report will include the following information:

- A detailed narrative summarizing construction, CQC, and QC Manager activities. This narrative will describe the personnel, equipment, and materials involved in each phase of construction and will be illustrated with sketches and selected photographs, as appropriate.
- A discussion of design changes implemented during the course of construction, as may be applicable. For each design change, this discussion will explain the circumstances which lead to the need for a change, describe the change itself, and provide a rationale for the selection of the change.
- Copy of the Weekly Summary Reports prepared by the QC Manager.
- Copy of the results for all field and laboratory CQC and QC Manager tests.
- Copy of all manufacturers' certification documents.
- Red-line Construction Drawings and Technical Specifications documenting design changes during construction.
- As-Built Drawings.
- A formal statement, signed and sealed by the Certifying Engineer, indicating that the landfill cover system as constructed conforms to Construction Drawings, Technical Specifications, and approved design changes.
- Inspection Report by QC Manager.

## **APPENDIX A**

### **FORMS AND REPORTS**

- A.1: Daily CQC Report Form**
- A.2: Weekly Summary Report**
- A.3: RFI/FCR Status Report**
- A.4: Weekly Progress/QC Meeting Minutes**
- A.5: Submittal Transmittal Form**
- A.6: Materials Received Report Form**
- A.7: Geotextile and Geomembrane Inspection Forms**
- A.8: Nonconformance Report**
- A.9: RFI/FCR Forms**
- A.10: Punch List Form**
- A.11: Initial Submittal Register**





**AVE WEEKLY SUMMARY REPORT  
AREA "A" LANDFILL IRA - CTO 203  
REPORT NO. 13 FOR THE PERIOD MAY 25 THROUGH MAY 31, 1997**

**GENERAL CONSTRUCTION ACTIVITY**

Area 1: Placement of drainage sand over the liner is approximately 90% complete. Woven geotextile and base course continued to be installed over approved sections of the drainage sand.

Area 2: Gas management sand and gas management pipe installation is nearly complete. Channels A and E have been backfilled with cohesive backfill to Culvert 1. GCL and LDPE liner installation began over the western portion of the area.

Area 3: Subgrade preparation continued throughout the week. Test pits were excavated along Channel A between Culverts 1 and 2 to search for the presence of landfill material beyond the final limit of landfill material. Landfill material was encountered between Station 20+00 and Culvert 2. The landfill material was excavated over a 200 foot section to four feet below subgrade. The excavation will be backfilled with low permeability soil.

Area 4: Additional GCL and LDPE liner were deployed over the Channel C sideslope. Drainage sand was spread over the completed section of liner. Installation of the woven geotextile and base course material began over the plateau this week.

General: Cohesive backfill, drainage sand and base course material was delivered to the site during the week. Survey support was ongoing during the week. The sidewalk guy wire was installed by Dicin Electric at the southern limit of IR Site 4.

**STATUS OF CQA TESTING AND INSPECTION**

CQA inspection of the subgrade preparation in Area 3 continued throughout the week.

CQA inspection of the GCL and LDPE liner installation in Areas 1 and 2 continued throughout the week. The Certifying Engineer was onsite to observe the installation.

Sand cone density testing of the gas management sand and drainage sand yielded similar results to those taken by the nuclear densiometer.

The second CQA destructive sample was sent to GeoTesting Express for peel and shear strength analysis. The test results are pending. Samples of drainage sand and base course were sent to the laboratory for geotechnical testing.

Field inspection of the geotextile seams was ongoing throughout the week.

**DELAYS IN SCHEDULE**

Foster Wheeler is approximately two days behind the baseline schedule. No construction delays were incurred this week.

**STATUS OF SUBMITTALS**

The following submittals were submitted for A/E review during this period:

- No. 055 - Geomembrane Interface Friction Tests.
- No. 056 - Geomembrane and GCL Installation Reports.
- No. 057 - Construction Phase Testing of Cohesive Backfill.
- No. 058 - Construction Phase Testing of Drainage/Gas Management Sand.

The following approved submittals were returned by the ROICC during this period:

- No. 050 - Geomembrane Resin and Roll Data.
- No. 051 - Construction Phase Testing of Drainage/Gas Management Sand.
- No. 052 - Non-Woven & Woven Geotextile Properties Tests.
- No. 055 - Geomembrane Interface Friction Tests.
- No. 056 - Geomembrane and GCL Installation Reports.

**STATUS OF RFI**

The following RFI's were submitted during this period. See Table 1 for the list and status of RFI's that have been submitted throughout the project.

- No. 019 - Request to Place Drainage Sand at a Minimum Density of 106 pcf in Order to Comply With the Permeability Specification.

**STATUS OF FCR**

The following FCR's were submitted during this period. See Table 2 for the list and status of FCR's that have been submitted throughout the project.

None.

**COMMENTS**

The first two CQA permeability test results for the gas management/drainage sand have yielded slower permeability's than the CQC tests for the same material under similar conditions. To accurately determine the differences between the two laboratories, a split sample of the material was taken this week for permeability analysis under the same density and moisture conditions. The test reports from both laboratories will be reviewed upon receipt to determine any variation in the testing procedures that may be the cause of the varying results.

---

Bryan Conley  
CQA Field Engineer

**TABLE 5-1**  
**SUMMARY OF REQUEST FOR INFORMATION (RFI) FORMS**  
**AREA A LANDFILL INTERIM REMEDIAL ACTION**  
**NSB-NLON GROTON, CONNECTICUT**

RFI#	SUBJECT	RESPONSE	RESPONSE DATE
1	Elevation of survey station #217.	Provided	1/24/97
2	Number of monitoring wells to abandon.	Provided w/comment	4/29/97
3	Decommissioning of the existing utilities along the southern limit of work.	Approved w/comment	2/2/97
4	Substitution of ADS pipe for HDPE pipe.	Re-submitted as FCR #3	3/11/97
5	Modification to the LDPE and GCL specification.	Re-submitted as FCR #4	3/11/97
6	Modification of the LDPE/GCL anchor trench.	Re-submitted as FCR #5	3/11/97
7	Use of a refurbished transformer in place of a new one.	Approved w/comment	3/24/97
8	Use of single leaf handhole covers.	Approved	4/16/97
9	Request to cut tires in half and place in the fill.	Approved w/comment	4/28/97
10	Request for the circuit number for the 5kV cable.	Provided	4/23/97
11	Use of overhead aluminum cable as installed.	Approved	4/23/97
12	Modification of Channels B, C and D sideslopes.	Approved	5/2/97
13	Modification of Channel A detail.	Approved	5/12/97
14	Reduction in sand conformance testing.	Approved	5/15/97
15	Reduction in the compaction of the gas management sand from 70% to 60% relative density.	Approved	5/19/97
16	Request for ten day liner exposure period.	Approved	5/19/97
17	Replace 24 gauge with 26 gauge on buildings.	Approved	5/21/97
18	Omit the synthetic bags around the pipe flanges.	Approved	5/22/97
19	Placement of drainage sand at a minimum of 106 pcf.	Re-Submitted as FCR #17	6/25/97
20	Permanent mounting of the transformer.	Approved	6/30/97
21	Use of new fixtures for the deployed parking lot.	Approved	7/31/97
22	Silt fence removal plan.	Approved	7/22/97
23	Omit grounding the deployed parking lot gate.	Disapproved	9/5/97

**TABLE 5-2**  
**SUMMARY OF FIELD CHANGE REQUEST (FCR) FORMS**  
**AREA A LANDFILL INTERIM REMEDIAL ACTION**  
**NSB-NLON GROTON, CONNECTICUT**

FCR#	SUBJECT	RESPONSE	RESPONSE DATE
1	Unsuitable subgrade in Area 4.	Approved w/comment	3/21/97
2	Stockpiling material on the landfill surface.	Rejected	3/21/97
2A	Stockpiling gas management sand on site.	Approved	4/17/97
3	Use of ADS pipe in place of HDPE pipe.	Rejected	3/21/97
4	Modification to the LDPE and GCL specification.	GCL and smooth LDPE approved; Textured LDPE rejected	3/21/97
5	Modification of the LDPE/GCL anchor trench.	Approved	3/21/97
6	Geotechnical testing of the IR Site 4 material.	Approved	3/21/97
7	Classification testing of common and select fill.	Approved	3/21/97
8	Reduction in the depth of the gabion baskets.	Rejected	3/27/97
9	Modification of the elliptical pipe size/joints.	Approved	4/10/97
10	Use of flowable fill to abandon existing RCP's	Approved	4/17/97
11	Protection of the gas vents above the asphalt.	Resubmit	5/1/97
11A	Protection of the gas vents above the asphalt.	Approved	5/5/97
12	Modification of the low permeability specification.	Approved	5/20/97
13	Stockpiling drainage/base course on site.	Approved	5/15/97
14	Modification of the Channel E bedrock tie-in.	Approved	6/2/97
15	Use of Class 1 asphalt in place of Class 2.	Approved	6/30/97
16	Elimination of the south slope drainage swale.	Approved	6/30/97
17	Placement of drainage sand at 106 pcf.	Approved	6/30/97
18	Replacing the modified riprap with gabion stone.	Approved	7/16/97
19	Salt storage building partition wall addition.	Approved	10/14/97
20	Electrical installations at the MAA Building.	Approved	10/14/97

AREA "A" LANDFILL CAP CONSTRUCTION  
SUBASE GROTON, CT

WEEKLY PROGRESS MEETING MINUTES

FOR THE WEEK ENDING MAY 24, 1997

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DISTRIBUTION:

Jim Briggs, NORTHDIV  
Mark Evans, NORTHDIV  
John McGrath, NORTHDIV  
Lt. Mark Wiersma, NSB-NLON  
Bill Hayward, NSB-NLON  
Andrew Stackpole, NSB-NLON  
Kymberlee Keckler, USEPA Region 1  
Mark Lewis, CTDEP  
Jean-Luc Glorieux, B&RE  
Douglas Cervenak, B&RE  
Bryan Conley, B&RE  
File 5082-3.3

Carl Tippmann, FWENC  
Dan Sullivan, FWENC  
Lyn Stewart, FWENC  
Peter Mooney, FWENC  
Michelle Pagano, FWENC

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The 12<sup>th</sup> weekly progress meeting began at 1430 hours on May 22, 1997, in the site trailer at the Area "A" Landfill.

ATTENDEES:

Lt. Mark Wiersma  
Dan Sullivan  
Lyn Stewart  
Peter Mooney  
Michelle Pagano  
Bryan Conley

ROICC  
FWENC  
FWENC  
FWENC  
FWENC  
B&RE

Construction NTR  
Site Superintendent  
Project Engineer  
Construction QC  
Project Controls  
CQA Field Engineer

## I. WORK ACCOMPLISHED

1. Construction of the drainage layer has been completed over the lined portion of Area 4. Density testing of the drainage sand is in progress.
2. Deployment of the GCL and LDPE was completed in Area 1. Quality control testing of the deployed liner is nearly complete. Placement of drainage sand, woven geotextile and base course began this week.
3. Placement of gas management sand in Area 2 is approximately 90% complete. Installation of the gas management piping is about 80% complete. Installation of the non-woven geotextile and cohesive backfill has been completed to the 18" RCP discharge. The Channel A subgrade excavation has been completed to Culvert 1. Cohesive backfill has been installed in the excavation to Station 16+00.
4. Subgrade preparation continues in Area 3. Channel A has been constructed between Culverts 1 and 2.
5. An additional 5 feet of soil was excavated south of Channel E in search of bedrock. Minimal bedrock was encountered during the excavation. Construction of Channel E will continue upon receipt of a response to FCR 14.
6. Cohesive backfill and drainage sand deliveries continue to arrive onsite.
7. Survey support continued throughout the week.

## II. WORK PLANNED

The following work items are scheduled to occur within the next two weeks:

1. Install the woven geotextile in Area 4 and begin to construct the base course layer.
2. Begin to construct and install the gabion baskets in Area 4.
3. Complete the drainage layer in Area 1 and continue to install the woven geotextile and base course.
4. Complete the gas management layer in Area 2 and begin to deploy GCL and LDPE liner.
5. Complete placement of the cohesive backfill in the Area 2 section of Channel A.
6. Begin placing cohesive backfill in Channel E if FCR 14 is approved.
7. Begin to construct Culvert 1.
8. Continue the subgrade preparation in Area 3. Begin to install the gas management sand and gas management piping on the plateau area and the non-woven geotextile and cohesive backfill on the north slope.
9. Begin to place cohesive backfill in the Area 3 section of Channel A.

## III. GENERAL MINUTES

1. FCR 14 has been submitted to the Navy for review and forwarding to the regulatory agencies for approval. Brown & Root will check on the status of the FCR so Foster Wheeler can continue to construct Channel E.
2. Additional confirmation samples in IR Site 4 will most likely not be taken since the majority of the soil has already been removed. Brown & Root will confirm this with the Navy.
3. The volume of soil remaining to be placed in Area 3 appears to be at least 1,000 CY less than the 3,500 CY that the regrading plan was designed to accommodate. ROICC will find out if any of the other sites around the base have a small amount of contaminated soil that could be incorporated into the landfill subgrade prior to closure.
4. The Channel C sideslope along the west slope of Area 4 will not be required to have the Nicolon HS 1150 woven geotextile placed. The TNS woven geotextile will be installed instead. The reasoning behind the decision was that the sideslope will not be part of the deployed parking lot and settlement should not be a major issue. The TNS material has one fourth the strength of the Nicolon material.
5. ROICC noted that sandbags at the Wahoo gate should remain accessible to the Navy since it is hurricane season. Access to the sandbags is presently clear.
6. Hauling of drainage sand over Hospital Hill has proceeded throughout the week without incidents or complaints.
7. Foster Wheeler is sending a letter of intent to their building vendor to provide the preengineered metal buildings. The estimated delivery time is 10 weeks. ROICC will expedite the review and approval of the submittals by the Navy.

#### IV. SCHEDULE REVIEW

- The overall project is currently two days behind the baseline schedule.

#### V. SUBMITTAL

The following submittals were submitted for A/E review during this period:

- No. 050 - Geomembrane Resin and Roll Data.
- No. 051 - Construction Phase Testing of Drainage/Gas Management Sand.
- No. 052 - Non-Woven & Woven Geotextile Properties Tests.
- No. 053 - GCL MQA/MQC Data.
- No. 054 - Geomembrane and GCL Installation Reports.

The following approved submittals were returned by the ROICC during this period:

- No. 012B - Geosynthetic Installer's Qualifications.
- No. 045 - Construction Phase Testing of In-Place Soil Density.
- No. 046 - GCL MQA/MQC Data.
- No. 047 - GCL MQA/MQC Data.
- No. 048 - Construction Phase Testing of Onsite Common Fill.
- No. 049 - Construction Phase Testing of Cohesive Backfill.

The following RFI's were submitted during this period:

- No. 015 - Request to Reduce the Relative Density Testing Requirement From 70% to 60%.
- No. 016 - Request for Ten Days of Exposure on the LDPE Liner Prior to Covering.
- No. 017 - Use of 28 Gauge Material to Construct the Gutters, Trim and Downspouts for the Preengineered Metal Buildings.
- No. 018 - Elimination of the Synthetic Bags Around the Gas Management Pipe Flanges.

The following FCR's were submitted during this period:

- No. 014 - Modification of the Channel E Bedrock Intercept Tie-In Detail.

#### VI. QUALITY ISSUES

- Foster Wheeler has been placing the drainage sand to the densities that have been proven to meet the specified permeability for the drainage layer. An RFI will be submitted to request a reduction of the 70% relative density compaction requirement to allow the soil to be placed at a lower density to meet the specified permeability.
- Foster Wheeler has performed an additional interface friction test on the textured liner to drainage sand interface to prove that the drainage sand can be placed at a lower density with an acceptable factor of safety against sliding. The results will be submitted for A/E review.

#### VII. COST STATUS

The project currently remains on budget.

#### VIII. SPECIAL INTEREST ITEMS

- The installation of GCL and LDPE liner in Area 2 is scheduled for the week of May 26, 1997.
- Installation of the gabions in Area 4 is scheduled to begin during the week of May 26, 1997.

#### IX. MEETING MINUTE REVISIONS

It was noted that Jim Briggs (NorthDiv) attended the May 15, 1997 progress meeting via telephone.

CONTRACT NO. N62472-D-0398	DELIVERY ORDER NO. 0034	ACTIVITY LOCATION NWS EARLE, COLTS NECK, NEW JERSEY
PROJECT TITLE: SITES 4 & 5 LANDFILL CAPS		
FROM: FOSTER WHEELER ENVIRONMENTAL / CQC PETER MOONEY		DATE 31 DECEMBER 97
TO: TOM DUNN ,ROICC		DATE 31 DECEMBER 97

1. THE CONTRACTOR SUBMITTALS LISTED BELOW ARE FORWARDED FOR YOUR:

- APPROVAL, APPLY APPROPRIATE STAMP IMPRINT TO EACH SUBMITTAL, RETAIN ONE (1) COPY OF THIS TRANSMITTAL FORM.
- REVIEW & COMMENT, RETURN REVIEWED COMMENT COPIES.
- INFORMATION ONLY.

2. SUBMITTALS SHOULD BE RETURNED BY (DATE) \_\_\_\_\_,  NO RETURN REQUIRED

RETURN TO:  ROICC  FOSTER WHEELER ENVIRONMENTAL  OTHER \_\_\_\_\_

3. APPROVAL REQUIRED BY:

NORTHDIV  ROICC  CQC  OTHER \_\_\_\_\_

COPY TO:

ROICC  NORTHDIV  OTHER  
 TOM DUNN PAUL BRIEGEL  
 (2 COPIES)

\_\_\_\_\_  
 SIGNATURE AND DATE

FROM APPROVING AUTHORITY (#3 ABOVE)	DATE
TO TOM DUNN ,ROICC	DATE

1. THESE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE RETURNED, WITH ACTION TAKEN AS INDICATED.

2. \_\_\_\_\_  
 \_\_\_\_\_

COPY TO:

ROICC  DESIGNER  OTHER

\_\_\_\_\_  
 SIGNATURE AND DATE

FROM TOM DUNN ,ROICC	DATE
TO FOSTER WHEELER ENVIRONMENTAL CORPORATION CONTRACTOR	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE APPROVED/DISAPPROVED AS SHOWN BELOW AND ON EACH STAMP IMPRINT.

COPY TO:

CONTRACTOR - FOSTER WHEELER ENVIRONMENTAL  OTHER

\_\_\_\_\_  
 FOR COMMANDING OFFICER,  
 NORTHERN DIVISION  
 NAVAL FACILITIES ENGINEERING COMMAND  
 DATE

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
100	Riprap Gradations SD-12, Field Test Reports Spec. Sec 02315 /2.3.2	Peter Mooney			



**GEOTEXTILE  
FIELD INSPECTION FORM  
AREA A LANDFILL**

<b>LOCATION</b>		
Woven:	Non-woven:	Panel Layout on Back:
<b>SUBSTRATE INSPECTION</b>		
Substrate Material:		
Acceptable:	Unacceptable:	Deficiency:
Comments:		
<b>MATERIAL INSPECTION</b>		
Visual Inspection:	Acceptable:	Unacceptable:
Comments:		
<b>METHOD OF PLACEMENT</b>		
Deployment Method:		
Comments:		
<b>SEAM INSPECTION</b>		
Sewing Machine Number:	Total Seam Length:	
Edge to Seam Limit (2-inch min.):	Acceptable:	Unacceptable:
<b>REPAIR INSPECTION</b>		
Location:		
Patch Size:		
Comments:		
C-QC Inspector	Title	Date



## GEOMEMBRANE PANEL DEPLOYMENT LOG

<b>PROJECT:</b>	Area A Landfill	<b>CONTRACTOR:</b>	Foster Wheeler Envir.
<b>LOCATION:</b>	Groton, Connecticut	<b>INSTALLER:</b>	Foster Wheeler Envir.
<b>JOB NO.:</b>	5082		

Date:	Page No.
Geomembrane:	
Subgrade Condition:	
Deployment Method:	
Comments:	

Description	Panel Number	Panel Number	Panel Number
Roll Number			
Ambient Air Temp.			
Weather Cond.			
Visual Observation			
Overlap			
Monitor			
Ballasting			
Comments			

Description	Panel Number	Panel Number	Panel Number
Roll Number			
Ambient Air Temp.			
Weather Cond.			
Visual Observation			
Overlap			
Monitor			
Ballasting			
Comments			

Description	Panel Number	Panel Number	Panel Number
Roll Number			
Ambient Air Temp.			
Weather Cond.			
Visual Observation			
Overlap			
Monitor			
Ballasting			
Comments			



**NONCONFORMANCE REPORT  
LANDFILL SITES 4 & 5**

To Officer In Charge of Navy Contracts

Date:

Naval Weapon Station Earle  
Colts Neck , New Jersey

Attn: Tom Dunn, ROICC

From:

References:

**NONCONFORMANCE DESCRIPTION:**

**ACTION REQUIRED:**

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**DISPOSITION:**

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

**Foster Wheeler Environmental Corporation  
Change Request Form**

Section 1 through 4 to be filled out by Foster Wheeler, Section 5 to be filled out by Navy

<b>PROJECT: Navy RAC D.O.</b>	OFS.No. <b>1284-00</b>	Change Request Form: <b>CRF- Rev.</b>
-------------------------------	---------------------------	--

To: \_\_\_\_\_ Dept. \_\_\_\_\_ Location: \_\_\_\_\_ Date: \_\_\_\_\_

Re:  Drawing No. \_\_\_\_\_ Title \_\_\_\_\_  
 Spec. No. \_\_\_\_\_ Title \_\_\_\_\_  
 Other \_\_\_\_\_

1. DESCRIPTION (*Items involved, submit sketch if applicable*) \_\_\_\_\_

2. REASONS FOR CHANGE (*If from disposition of nonconformance report, list report number*) \_\_\_\_\_

3. RECOMMENDED DISPOSITION

- Technical Clarification [NTR approval required]
- Out of Scope [CO/COTR approval required]
- Cost Growth
- ROM Estimate (If Applicable) \$ \_\_\_\_\_
- Schedule Impact \_\_\_\_\_

**FWENC Initiator (Signature/Title):**

4. FWENC Project Manager (Signature)	Date	Project Superintendent Concurrence (Signature)	Date
--------------------------------------	------	--	------

5. NAVY DISPOSITION

- Approved per recommended disposition
- Not approved (give reason)
- Approved with modification(s) [describe below]

NTR Concurrence ( <i>Signature</i> )	Date	ROICC Concurrence ( <i>Signature</i> )	Date
Contracting Officer Technical Representative Approval ( <i>Signature</i> )		Contracting Officer Approval ( <i>Signature</i> )	Date

Engineer signs and transmits to Resident Engineer with copies to:

\_\_\_\_\_ Project Manager      Others as Required \_\_\_\_\_  
 \_\_\_\_\_ Project Superintendent      File: \_\_\_\_\_  
 \_\_\_\_\_ Quality Control \_\_\_\_\_

# PUNCH LIST

PAGE NO. \_\_\_\_\_

ITEM NO.	DATE	DESCRIPTION	SPEC./DRWG. REFERENCE	DATE CORRECTED	ENGINEER SIGN-OFF

**SUBMITTAL REGISTER**

Contract Number: N62472-94-D-0398 D.O. # 0034

Project Title: Landfill Caps for Sites 4 and 5

LOCATION: NWS-Earle, NJ

CONTRACTOR: Foster Wheeler Environmental Corporation

SPEC SECTION NO.	SD NO. & TYPE OF SUBMITTAL-MATL OR PRODUCT	SPEC PARA NO.	CLASSIF/ APPR BY CO *	GOVT OR A/E REVR	TRANS CONTRL NO.	PLANNED SUBMITTAL DATE	ACT. CODE	DATE OF ACTION	CONTRACTOR ACTION				APPROVING AUTHORITY ACTION				CONTR	
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(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)			
02142	SD-02, Manufacturer's Catalog Data																	
	VFPE Geomembrane	2.1	G			2/14/98												
	SD-04, Drawings																	
	Panel Layout	1.2.2.1	G			2/14/98												
	SD-06, Instructions																	
	VFPE Geomembrane	2.1	G			2/14/98												
	SD-08, Statements																	
	Manufacturer's Qualifications	1.4.1	G			2/14/98												
	Installer's Qualifications	1.4.2	G			2/1/98												
	Manufacturer's Warranty	1.5.1	G			5/1/98												
	SD-10, Test Reports																	
	Shear Test Requirements	1.2.5.1	G			2/28/98												
	SD-12, Field Test Reports																	
	Field Technical Service Reports	1.2.6.1	G			As Placed												
	SD-13, Certificates																	
	VFPE Geomembrane	2.1	G			2/14/98												
	Site Preparation	1.2.7.2	G			As Placed												
	SD-14, Samples																	
	VFPE Geomembrane	2.1	G			2/14/98												

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02143	SD-02, Manufacturer's Catalog Data																	
	Polyvinyl Chloride (PVC) Plastic	2.1				2/1/98												
	Pipe and Fittings																	
	SD-06, Instructions																	
	Installation	3.1.1				2/1/98												
02220	SD-08, Statements																	
02272	SD-02, Manufacturer's Catalog Data																	
	Non-woven Cushion Material	2.1.1.1	G			2/21/98												
	Roadway Stabilization Fabric	2.1.1.2	G			3/10/98												
	Non-woven Geotextile	2.1.1.3	G			3/3/98												
	SD-06, Instructions																	
	Manufacturing, Sampling and Testing	2.2.1				3/3/98												
	SD-13, Certificates																	
	Non-woven Cushion Material	2.1.1.1	G			3/25/98												
	Roadway Stabilization Fabric	2.1.1.2	G			5/1/98												
	Non-woven Geotextile	2.1.1.3	G			4/2/98												
	SD-14, Samples																	
	Non-woven Cushion Material	2.1.1.1				2/21/98												
	Roadway Stabilization Fabric	2.1.1.2				3/10/98												

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02315	Non-woven Geotextile	2.1.1.3				3/3/98												
	SD-11, Factory Test Reports																	
	Acid Producing Soil Test	2.2.1.1				3/30/98												
	SD-12, Field Test Reports																	
	Select Fill/Backfill	3.9.2.1				2/7/98												
	Granular Material	3.9.2.2				2/14/98												
	Density Tests	3.9.2.3				As Placed												
02524	SD-12, Field Test Reports																	
	Well Abandonment Form	3.1	G			As Placed												
02524	SD-13, Certificates																	
	Casing	2.1.2				3/3/98												
	Cement	2.1.5				3/3/98												
02530	SD-02, Manufacturer's Catalog Data																	
	Pipeline materials	2.1	G			4/14/98												
	Tank Materials	2.2	G			4/14/98												
	SD-04 Drawings																	
	Holding Tank	2.2.1	G			4/14/98												
	SD-05 Design Data																	
	Design Calculations	1.3.3.1	G			4/14/98												
	SD-12 Field Test Reports																	

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	Leakage Testing	3.2.2.1	G			As Laid											
02582	SD-02 Manufacturer's Catalog Data																
	Precast Concrete Structures	2.1.3.1	G			3/26/98											
	Frames and Covers	2.1.1.2	G			3/26/98											
	Frames and Covers	2.1.3.2	G			3/26/98											
	Sealing Material	2.1.3.1	G			3/26/98											
	Cable racks, Arms & Insulators	2.1.2	G			3/26/98											
	SD-04 Drawings																
	Precast Handhole	1.3.2.1	G			3/26/98											
	Pulling-in Irons	3.1.4.3	G			3/26/98											
02631	SD-02 Manufacturer's Catalog Data																
	Corrugated Plastic Piping	2.1.1				2/1/98											
02741	SD-08 Statements																
	Mix Delivery Record	1.2.1.1				As Placed											
	Asphalt Concrete	2.1				4/21/98											
02741	SD-11 Factory Test Reports																
	Trial Batch	1.2.2.1				4/21/98											
	Mix Design	1.2.2.2				4/21/98											
	SD-12 Field Test Reports																
	Asphalt Concrete	2.1				As Placed											

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	Density	3.2.2.2				As Placed										
	Density	3.3.2.3				As Placed										
	Thickness	3.3.2.2				As Placed										
	Thickness	3.3.2.3				As Placed										
	Straightedge Test	3.3.2.2				As Placed										
	SD-13, Certificates															
	Asphalt Concrete	2.1				As Used										
	Curbs	2.3				As Used										
	SD-14 Samples															
	Uncompacted Mix	3.3.2.1				As Used										
	Cores	3.2				As Used										
02921	SD-02 Manufacturer's Catalog Data															
	Fertilizer	2.5				3/21/98										
	SD-07 Schedules															
	Seed	2.1				3/21/98										
	SD-10 Test Reports															
	Topsoil Composition Tests	1.3.3.1				3/21/98										
	SD-11 Factory Test Reports															
	Acid Producing Soil Test	2.2.1.1				3/21/98										
02951	SD-07 Schedules															

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03300	Nursery Certifications	2.1.1				3/28/98												
	SD-06 Instructions																	
	Liquid Membrane Forming Compounds	2.3.2				3/28/98												
16301	SD-13 Certificates																	
	Concrete	2.1				As Used												
	SD-01 Data																	
	Tested Transformer Losses	2.5.2	G			3/21/98												
	SD-02 Manufacturer's Catalog Data																	
	Transformer	2.5	G			3/21/98												
	SD-11 Factory Test Reports																	
	Routine and Other Tests	2.8.2	G			3/21/98												
	SD-12 Field Test Reports																	
	Acceptance Checks & Tests	3.2.1	G			AS Installed												
16400	Ground Resistance Test Reports	1.4.4.1	G			As Installed												
	SD-18 Records																	
	Transformer Test Schedules	2.8.1	G			3/21/98												
	SD-02 Manufacturer's Catalog Data																	
	Panelboard	2.1				3/21/98												
	SD-04 Drawings																	

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	Panelboard	2.1				3/21/98											
	SD-18 Records																
	Service & Distribution	1.2.3.1				As Installed											
16403	SD-02 Manufacturer's Catalog Data																
	Wires & Cables	2.1				3/21/98											
	Conduit	2.3				3/21/98											
	Conduit Fittings	2.4				3/21/98											
16403	Ground Rods	2.5				3/21/98											
	SD-12 Field Test Reports																
	Cable Test	3.2.1				As Installed											
16524	SD-02 Manufacturer's Catalog Data																
	Lighting Fixtures	2.1				3/21/98											
	SD-04 Drawings																
	Installation Details	1.2.2.1				3/21/98											
	SD-12 Field Test Reports																
	Operational Test	3.2				As Installed											

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**FIELD SAMPLING PLAN (FSP)  
SITE 5 (SKEET RANGE)  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY**

**REMEDIAL ACTION CONTRACT N62472-94-D-0398  
DELIVERY ORDER NO. 0034**

*Issued:  
January 14, 1998*

*Prepared for:*

**Naval Facilities Engineering Command  
10 Industrial Highway  
Lester, PA 19113**

*Prepared by:*

**FOSTER WHEELER ENVIRONMENTAL CORPORATION**  
*2300 Lincoln Highway  
One Oxford Valley - Suite 200  
Langhorne, PA 19047 - 1829*

**FIELD SAMPLING PLAN (FSP)  
SITE 5 (SKEET RANGE)  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY**

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## **1.0 INTRODUCTION**

Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) has been contracted by the Northern Division, Naval Facilities Engineering Command to provide a remedial action at Site 5 (Skeet Range) at Naval Weapons Station (NWS) Earle located in Colts Neck, New Jersey. This Field Sampling and Analysis Plan has been prepared to satisfy requirements of Remedial Action Contract Number N6247-94-D-0398, Delivery Order No. 0034.

Foster Wheeler Environmental Corporation has been contracted by the Navy to perform a remedial action at Site 5. The remedial action to be performed at Site 5 requires field sampling and analysis data for the decision making process. The Field Sampling and Analysis Plan describes the program which ensures that the chemical data meet the requirements for completeness, precision, accuracy, representativeness, comparability, dependability, and legal defensibility presented in the Navy Installation Restoration Laboratory Quality Assurance Guide, February 1996.

### **1.1 SITE LOCATION**

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City (Figure 1-1). The facility was commissioned in 1943, and its primary mission is to supply ammunition to the Naval Fleet. The work under this contract will take place at Operable Unit 1 (OU-1), located on the 10,248-acre Main Base. OU-1 is comprised of 2 areas, Site 4 and Site 5 (Figure 1-2). These sites were historically used by the Navy for disposal of municipal and industrial wastes as well as a skeet shooting range.

### **1.2 CURRENT CONDITIONS**

Currently, the skeet range has been closed for demolition so that a synthetic cap can be placed over the landfill. An area adjacent to the east side of the landfill is part of the fall-out zone for the skeet shooting range. The surface soil (0-6 inches) is contaminated with lead from the ammunition, or lead shot, used to target the skeet. Several areas are known to contain levels of lead ranging from 1,000 mg/kg to 64,000 mg/kg. Some surface areas exhibit obvious signs of visible contamination, as well as, stressed vegetation.

## **2.0 SAMPLE DESIGNATION**

### **2.1 SAMPLE IDENTIFICATION SYSTEM**

The objective of the sample identification system is to provide a framework for developing sample numbers that are unique to that sample and convey information regarding sample type that will enable data users to easily identify sample locations. The procedures outlined in this section are consistent with the USEPA Compendium of Superfund Field Operations Methods - EPA 540

P-87001, the USEPA REM-III Field Technical Guidelines and the NJDEP Field Sampling Procedures Manual (May 1992).

### 2.1.1 Sample Designation

Each sample will be designated by an alpha-numeric code which will identify the matrix sampled and contain a sequential sample number. Location types will be identified by a two-letter code. Each matrix sampling location will be identified with a two-digit number. Sequential sample numbers at each location for each sample type will begin with 01 and increase accordingly. Sampling events, or rounds, will be numbered in a sequence beginning with "01."

The following is a general guide for sample identification:

<u>First Segment</u>	<u>Second Segment</u>	<u>Third Segment</u>
AN ---	AA NN ----	NN
Site Name	Sample Type	Specific Location
		Sampling Event

Symbol Definition:

A = Alphabetic  
N = Numeric

Site Name

S5 = Site 5

Sample Type:

SS = Surface Soil  
DP = Duplicate Sample  
RB = Rinsate Blank

For example, a surface soil sample obtained at sampling location 01 during the first round of sampling will be identified as S5-SS01-01. A duplicate sample from the same location would be labeled as S5-DP01-01.

The sample identifier will increase sequentially from 01 following collection of the initial sample.

A cumulative sampling master log will be maintained as the field program progresses. The samples taken will be referenced to each sampling location in the master log and on a detailed site map.

### 2.1.2 Sample Documentation

A bound field logbook with numbered, water resistant pages must be used to document all pertinent information regarding the site and sampling activities, including but not limited to, weather conditions, daily activities, sampling procedures, waste generation, sample locations and descriptions, and any other information deemed necessary to accurately describe site conditions and activities. The time, date, and signature of the person that made the entry should be noted on each page of the logbook.

Photo documentation of sampling points may be conducted if site conditions warrant it. Each photo taken should be identified in the field logbook. At a minimum the following information should be recorded:

1. Date;
2. Time;
3. Photographed by (Signature);
4. Name of site;
5. General direction faced and description of the subject taken; and,
6. Sequential number of the photograph and the roll number

Sample Labels will be filled out and placed onto the sample bottle prior to sample collection. The sample label will be protected with clear plastic tape. Sample labels will include the sample number, analytical parameter sampled, date sampled, time sampled, samplers initials, and the site name or location.

A Chain of Custody (COC) form will be filled out for all samples to be sent to a laboratory. The COC form is intended as a legal record of possession of the samples. The COC should remain with the samples at all times and bears the name of the person assuming responsibility for the samples.

## 2.2 SAMPLE ANALYTICAL REQUIREMENTS

Table 2-1 specifies location, number of samples and duplicates, matrix, sample container requirements, sample preservation, holding times, laboratory analysis and field analysis performed on each sample type. Specific procedures governing sample preservation are below. Procedures were obtained from the USEPA REM-III Field Technical Guidelines.

Reagents required for sample preservation will be added to the sample containers by the laboratory prior to their shipment to the field. In general, aqueous samples of low concentration organics (or soil samples of low or medium concentration organics) are cooled to 4°C. Medium concentration aqueous samples and high hazard organics samples are not preserved.

TABLE 2-1  
 SITE 5 (SKEET RANGE)  
 NAVAL WEAPONS STATION EARLE  
 COLTS NECK, NEW JERSEY  
 SAMPLING AND ANALYSIS PROTOCOL INFORMATION

Location/ Objective	Sample Type/ Matrix	Sample Quantity	Parameters	Sample Container	Sample Preservative	Analytical Method	Method Detection Limit	Holding Times
<i>Crown Leisure Products Corporation - Soil Gas Sampling</i>								
Site 5	Surface Soil (0-6")	83	Total Lead	(1) 8 oz glass jar with Teflon-lined lid.	4°C	Method 7420 (SW 846)	1 mg/kg	6 months
Site 5	Surface Soil (0-6")	20	TCLP Lead	(1) 8 oz glass jar with Teflon-lined lid	4°C	Extraction Method 1311 (SW 846); Analyze by Method 7430 (SW 846)	100 µg/L	
Rinsate Blank	Water	2	Total Lead	(1) 1 Liter Polyethylene bottle with Teflon-lined lid.	pH < 2 w/HNO <sub>3</sub> ; 4°C	Method 7420 (SW 846)	100 µg/L	6 months

**Notes:**

1. The Quality Control/Quality Assurance samples are included in the table above.
2. The number of rinsate blank samples is estimated.
3. The number in parentheses in the "sample container column" denotes the number of containers needed. Double volume is required for matrix spike/matrix spike duplicate (MS/MSD) analysis of soil samples. One MS/MSD sample will be collected from the soil samples.
4. SW-846 - Test Methods for Evaluating Solid Waste, OSWER, November 1986, revised January 1995.
5. Detection limits for soil samples may vary due to percent moisture. The limits listed for soil are based on wet weight.
6. All holding times listed are from Verified Time of Sample Receipt (VTSR) by the laboratory unless noted otherwise.
7. The detection limits given are the instrument detection limits obtained in pure water that must be met using the procedure specified. Actual detection limits for field samples will be higher.

## 2.3 SAMPLE PACKAGING AND SHIPPING

The objective of the sample packaging and shipping requirements are to maintain sample integrity from the time a sample is collected until it is received at the analytical laboratory. Chain-of-Custody (COC) forms, sample labels, custody seals, and other sample documents will be completed as specified in Section 5.0 of the QAWP. Specific procedures for packaging and shipping of environmental samples are presented below. These procedures were obtained from the USEPA Compendium of Superfund Field Operations Methods.

### 2.3.1 Environmental Samples

Low-concentration samples are defined as environmental samples and should be packaged for shipment as follows:

1. A sample label is attached to the sample bottle. The label should be taped over with clear packing tape to preserve legibility.
2. A picnic cooler (such as a Coleman or other sturdy cooler) is typically used as a shipping container. In preparation for shipping samples, the drain plug is taped shut from the inside and outside, and a large plastic bag is used as a liner for the cooler. Approximately one inch of packing material, such as asbestos-free vermiculite, perlite, or styrofoam beads, is placed in the bottom of the liner.
3. The bottles are placed in the lined picnic cooler. Cardboard separators, and/or additional packing material, should be placed between the bottles to prevent breakage during shipping.
4. Water samples for low or medium-level organics must be shipped cooled to 4°C with ice. No ice is to be used in shipping organic high-level water or soil samples. Ice is not required in shipping soil samples, but may be utilized at the option of the sampler.
5. The remaining voids in the cooler are filled with the packing material and the inner liner is taped closed. Sufficient packing material should be used to prevent sample containers from making contact during shipment.
6. The paperwork being shipped to the laboratory is placed inside a plastic bag. The bag is sealed and taped to the inside of the cooler lid. A copy of the Chain-of-Custody (COC) form should be included in the paperwork sent to the laboratory. The last block on the COC form should indicate the overnight carrier and airbill number. The airbill must be filled out before the samples are handed over to the carrier. The laboratory should be notified if the shipper suspects that the sample contains any substance for which the laboratory personnel should take safety precautions.

7. The cooler is closed taped shut with strapping tape (filament-type).
8. At least two signed custody seals are placed on the cooler, one on the front and one on the back.
9. The cooler is handed over to the overnight carrier. A standard airbill is necessary for shipping environmental samples.

### **3.0 FIELD INVESTIGATION ACTIVITIES**

#### **3.1 STANDARD OPERATING PROCEDURES**

Technical guidelines utilized in preparing this Field Sampling Plan were obtained primarily from the following sources:

- The USEPA Compendium of Superfund Field Operations Methods (USEPA Compendium of Methods).
- The USEPA REM-III Program Field Technical Guidelines, prepared for the USEPA by Ebasco under Contract Number 68-01-7250 (Field Technical Guidelines).
- The New Jersey Department of Environmental Protection and Energy Field Sampling Procedures Manual, May 1992.

All of the aforementioned guidance documents were considered in the preparation of this FSP to ensure that the procedures presented in this FSP are consistent with each document.

#### **3.2 FIELD INVESTIGATION PROGRAM**

The following sections detail the field investigation program. Primary tasks of the program include:

- Mobilization/Demobilization (Section 3.2.1)
- Surface Soil Sampling (Section 3.2.2)

##### **3.2.1 Mobilization/Demobilization**

This activity will include the mobilization/demobilization of field personnel and equipment to/from the site. Prior to mobilization, an orientation meeting of all field personnel will be held to review site history and layout, health and safety training, and field procedures.

Field equipment will include the following:

1. Site vehicles;
2. Sampling equipment;
3. Equipment decontamination materials; and
4. Health and Safety equipment.

### 3.2.2 Surface Soil Sampling

#### ***Objective***

The objectives of the surface soil sampling program is to collect samples from 0-6 inches below surface grade for total lead and to identify and delineate the extent of surficial contamination of lead due to lead shot used at the skeet range. The site specific clean-up standard for lead is 400 ppm. A contour map will be developed based on analytical results to determine the areas that exceed the clean-up standard. These areas will be excavated and placed onto the landfill prior to the installation of the final cap. This work will be addressed under a separate Work Plan.

#### ***Sample Location and Frequency***

In December 1997, several samples were collected by the Navy and analyzed for total lead along radial lines at the 350 and 450 foot radii (Figure 3-1, Appendix A). Foster Wheeler will collect samples from these same locations and analyze them for total lead for confirmatory purposes. In addition, samples will be collected by Foster Wheeler Environmental along these same radial lines at the 300, 500, 550, 600, 650, and 700 foot radii. Samples will also be collected between these radial lines to more accurately define the extent of contamination.

A second jar of soil will be collected from each location. This jar will be held by the laboratory for toxicity characteristic leaching procedure (TCLP) lead analysis after the results of the total lead analysis are reported (48 hour turn around time). Any sample exhibiting a detection of total lead above 400 mg/kg will then be analyzed for TCLP lead to determine its ultimate disposal destination (within the landfill or off-site). A total of up to 80 samples will be collected for total lead analysis and TCLP lead analysis. All 80 total lead samples will be analyzed. It is anticipated that approximately 20 samples will be analyzed for TCLP lead. The proposed sample locations are depicted on Figure 3-1 in Appendix A.

Also, three samples will be collected from the surface soil (0-6 inches) from on top of the landfill. The exact sample locations will be determined on-site. The sample locations will be biased to areas that appear to be the most grossly contaminated. The samples will be analyzed with the same procedure as the above mentioned samples.

#### ***Sampling Equipment and Procedures***

The samples will be collected with a decontaminated stainless steel trowel or disposable trowel and placed into a sample jar. The samples will be labeled as per Section 2.1.2. The samples will be collected by first removing any surface debris from a 6 inch by 6 inch area. Surface debris includes vegetation, rocks, sticks, roots, garbage, and any other object that

may interfere with the integrity of the sample. Next the sample will be collected by breaking up the soil from 0-6 inches and placing it into the proper sample jar. Each sample location will be marked with a wooden stake or flag and the sample location ID will be written on the stake/flag.

### ***Sample Handling and Analysis***

The samples will be kept on ice and packaged at the end of each day for shipment to the analytical laboratory. Proper chain of custody procedures as described in Section 2.3 will be followed. All of the samples collected will be analyzed for total lead by Method 7420 (SW 846). Only those samples that have total lead results above 400 mg/kg will be analyzed for TCLP lead via extraction method 3011 and analyzed via method 7240 (SW 846). The details of the chemical sample analyses are provided in Table 2-1.

### **3.3 DECONTAMINATION**

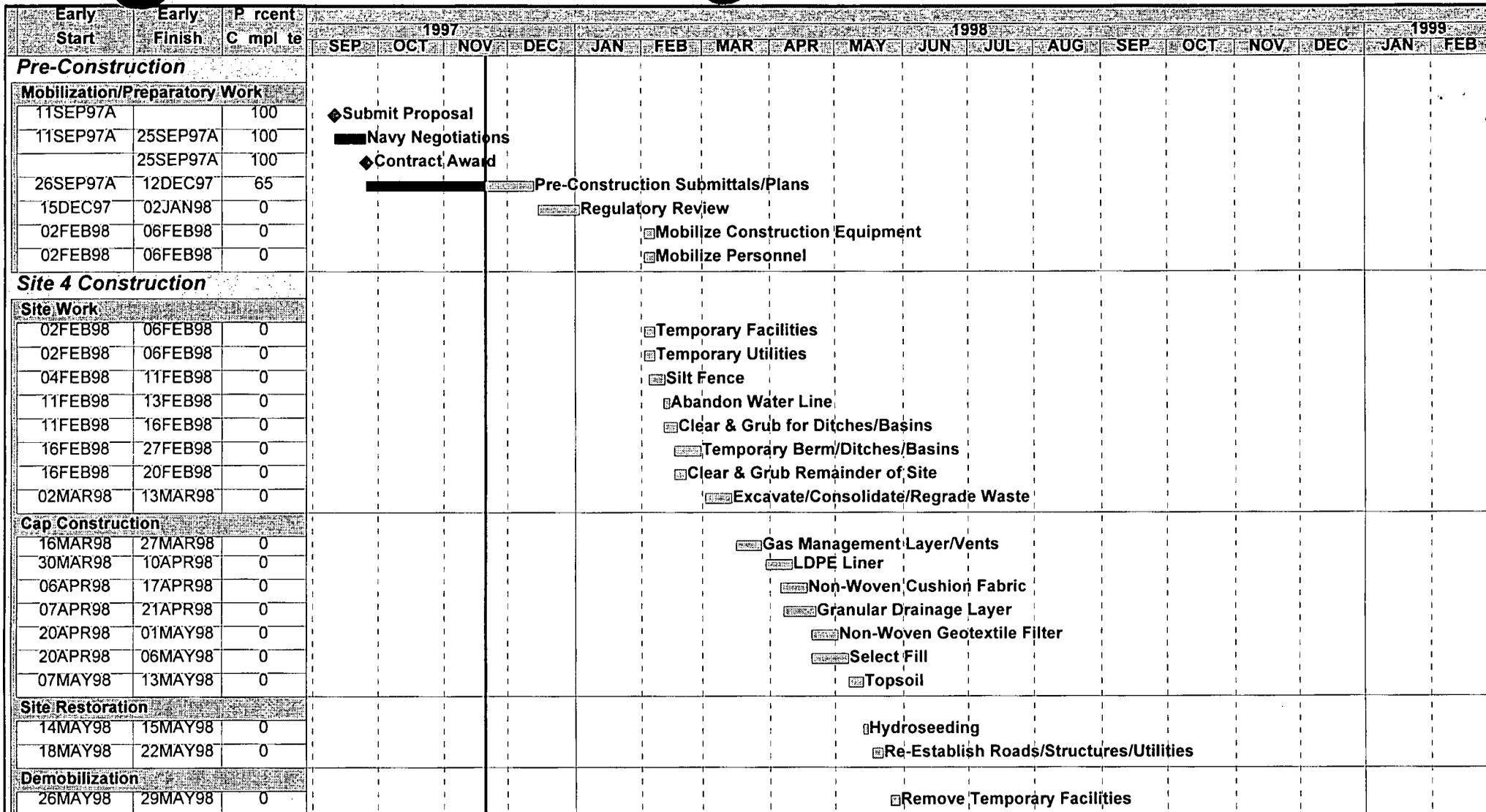
The objective of this section is to provide the methodology for the proper decontamination procedures to be used on chemical sampling and field analytical equipment.

In order to assure that chemical analysis results are reflective of the actual concentrations present at sampling locations, chemical sampling and field analysis equipment must be properly decontaminated prior to the field effort, during the sampling program (i.e., between sample points) and at the conclusion of the sampling program. This will minimize the potential for cross-contamination between sample points and the transfer of contamination off-site.

Prior to sampling, soil, sediment and water sampling equipment will be decontaminated using the following procedures:

1. Physical removal of soil or gross contamination;
2. Potable water rinse;
3. Alconox or Liquinox detergent wash;
4. Scrubbing with a scrub brush may be required if the equipment is heavily contaminated with heavy or extremely viscous compounds (not anticipated);
5. Potable water rinse;
6. Nitric Acid rinse;
7. Distilled, deionized water rinse;
8. Air dry;
9. Wrap sampling equipment in aluminum foil (shiny side out).

Decontamination fluids containing nitric acid solutions should be containerized separately from rinse water consisting of water and soap only.



Project Start 01SEP97  
 Project Finish 03JUL98  
 Data Date 21NOV97  
 Run Date 16JAN98

Early Bar  
 Progress Bar

3400

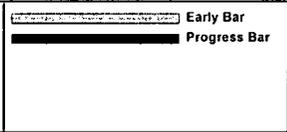
Sheet 1 of 3

D.O. 34 - NWS EARLE  
 Landfill Cap Construction

Early Start	Early Finish	Percent Complete	1997				1998				1999								
			SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
<b>Site 5 Construction</b>																			
<b>Site Work</b>																			
02FEB98	09FEB98	0																	
16FEB98	25FEB98	0																	
23FEB98	19MAR98	0																	
23FEB98	27FEB98	0																	
02MAR98	24MAR98	0																	
02MAR98	09MAR98	0																	
25MAR98	17APR98	0																	
25MAR98	13APR98	0																	
<b>Cap Construction</b>																			
14APR98	01MAY98	0																	
27APR98	15MAY98	0																	
11MAY98	28MAY98	0																	
11MAY98	29MAY98	0																	
20MAY98	05JUN98	0																	
20MAY98	09JUN98	0																	
08JUN98	19JUN98	0																	
<b>Site Restoration</b>																			
08JUN98	19JUN98	0																	
22JUN98	24JUN98	0																	
<b>Demobilization</b>																			
29JUN98	03JUL98	0																	
<b>Construction Support</b>																			
11SEP97A	02JUL98	25																	
02FEB98	24JUN98	0																	
23FEB98	02JUL98	0																	
11FEB98	19JUN98	0																	
16MAR98	19JUN98	0																	

- Temporary Facilities
- Silt Fence
- Skeet Range Demolition
- Clear & Grub for Ditches/Basins
- Temporary Ditches/Basins
- Clear & Grub Remainder of Site
- Excavate/Consolidate/Regrade Waste
- Shooting Range/Soil Removal
- Gas Management Layer/Vents
- LDPE Liner
- Non-Woven Cushion Fabric
- Granular Drainage Layer
- Non-Woven Geotextile Filter
- Select Fill
- Topsoil
- U/G Electrical/Telephone
- Hydroseeding
- Remove Temporary Facilities
- 99xx - Project Management
- Survey Services
- Transportation & Disposal
- Lab Analysis/Geotechnical Testing
- Guard Service

Project Start 01SEP97  
 Project Finish 03JUL98  
 Data Date 21NOV97  
 Run Date 16JAN98



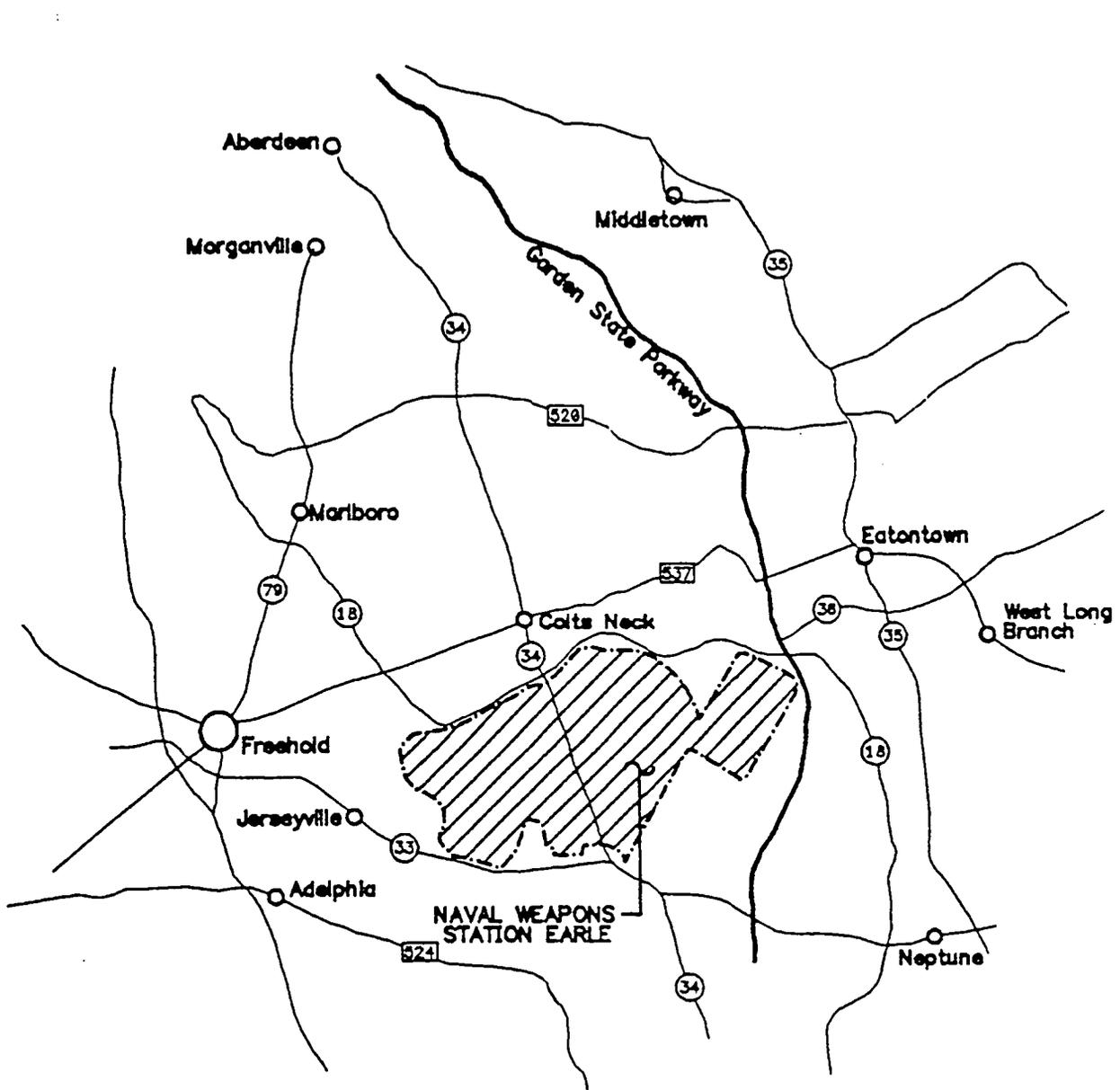
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Sheet 2 of 3

D.O. 34 - NWS EARLE  
 Landfill Cap Construction

**APPENDIX A**

**SITE MAPS**



N.T.S.

PLOT DATE DEC 1997 D:\EarleLandfill\Fig1-2



**FOSTER WHEELER  
ENVIRONMENTAL  
CORPORATION**

SITE VICINITY  
US NAVY RAC  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY

Figure  
**1-1**

FOSTER WHEELER  
ENVIRONMENTAL  
CORPORATION

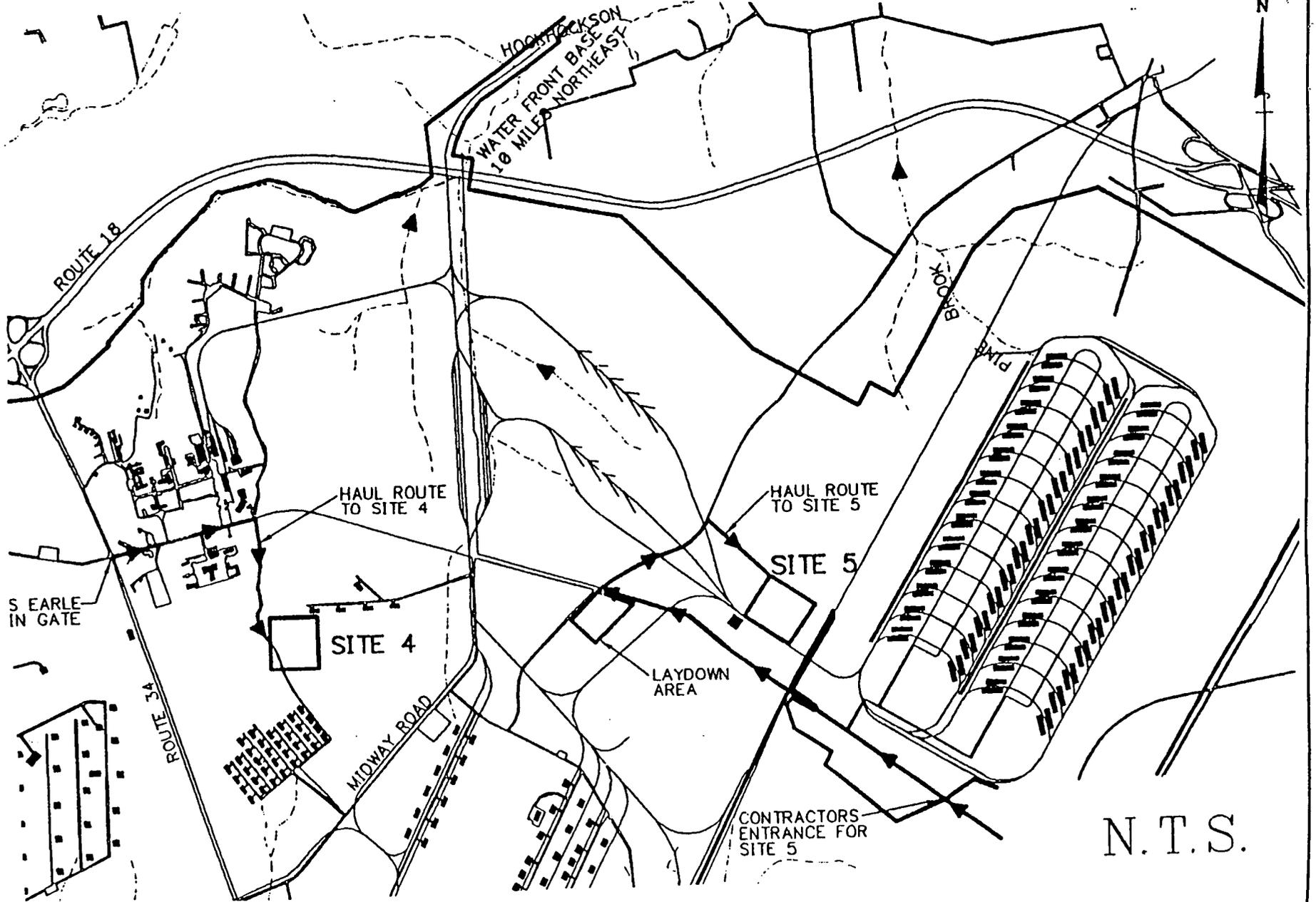


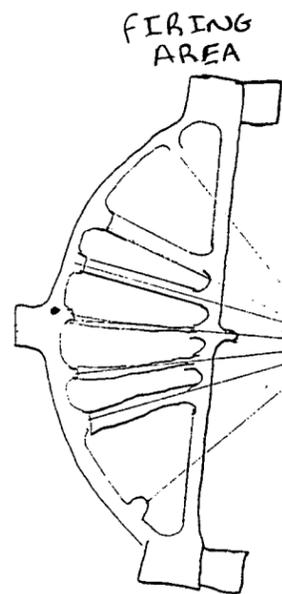
PROJECT LOCATION  
US NAVY RAC  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY

PROJECT LOCATION

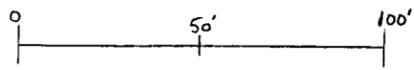
Figure

1-2





APPROXIMATE SCALE



1" = 50'  
1:600

- ⊗ Proposed Sample Location
- ⊙ Previous Sample Locations to be Resampled

05-SS-01  
84.27

05-SS-14  
59.25

Extent of Landfill Cap

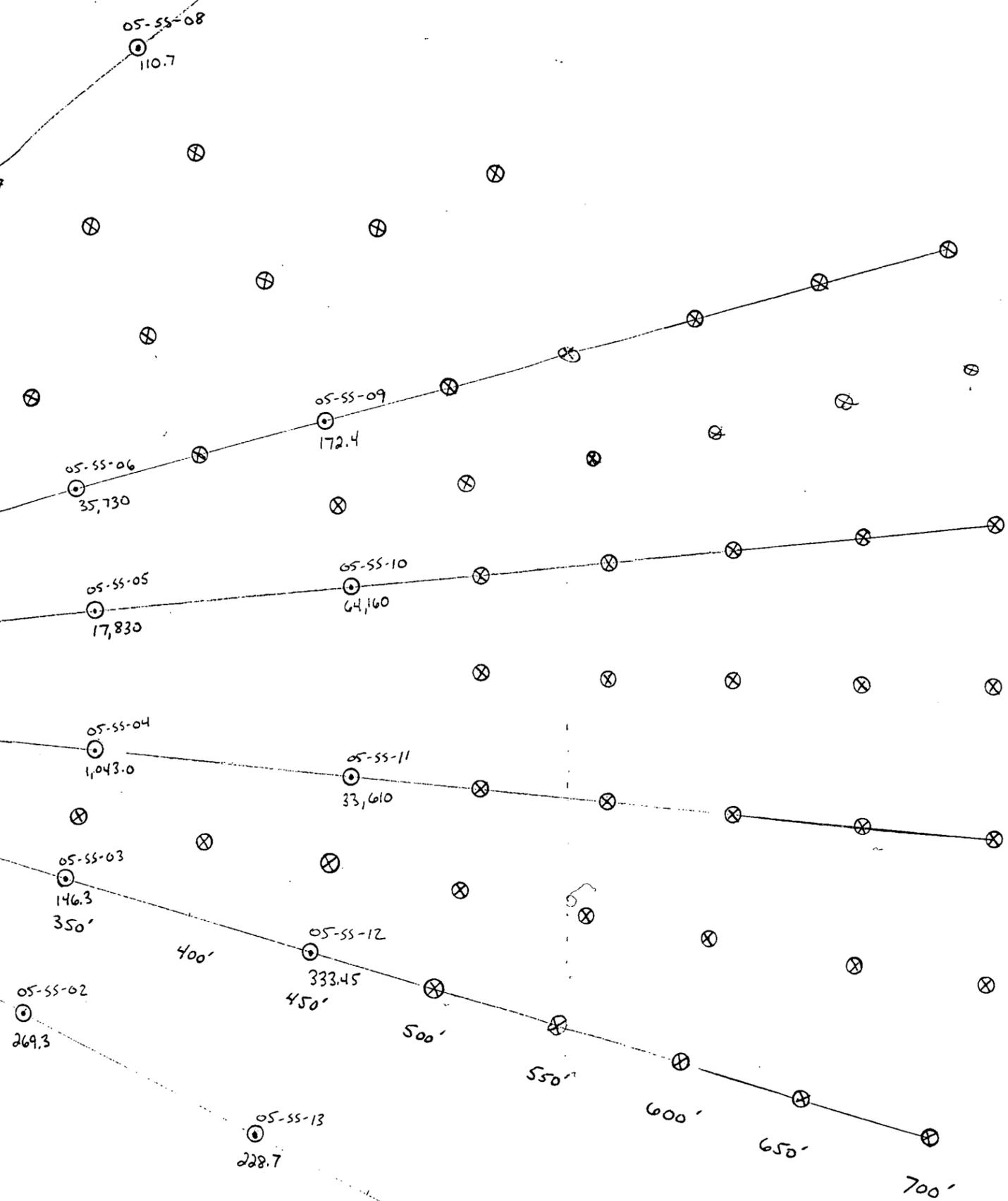


FIGURE 3-1  
Proposed Sample Locations

**FINAL  
SITE HEALTH AND SAFETY PLAN**

**Site:** NAVAL WEAPONS STATION - EARLE  
OPERABLE UNIT 1 (SITES 4 AND 5)

**Location:** COLTS NECK, NJ

**Prepared By:** FOSTER WHEELER ENVIRONMENTAL CORPORATION

**Date Prepared:** JANUARY 23, 1998

**Revision:** 00

**Delivery Order:** 0034

**Project Description:** INSTALLATION OF LANDFILL CAP AT SITES 4 AND 5

**Comments:** INCLUDES ROICC COMMENTS OF JANUARY 14, 1998 AND NETC  
COMMENTS OF JANUARY 8, 1998

**Waste types:** Liquid, Sludge, Solid

**Characteristics:** Volatile, Toxic, Ignitable

**Unusual Site Features:** 100 to 300 feet above mean sea level

**Status:** Active

**Overall Hazard:** Moderate

FOSTER WHEELER ENVIRONMENTAL CORPORATION, FOSTER WHEELER SUBCONTRACTORS, AND THE DEPARTMENT OF THE NAVY DO NOT GUARANTEE THE HEALTH OR SAFETY OF ANY PERSON ENTERING THIS SITE. DUE TO THE NATURE OF THIS SITE AND THE ACTIVITY OCCURRING THEREON, IT IS NOT POSSIBLE TO DISCOVER, EVALUATE, AND PROVIDE PROTECTION FOR ALL POSSIBLE HAZARDS WHICH MAY BE ENCOUNTERED. STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THIS SITE. THE HEALTH AND SAFETY GUIDELINES IN THIS PLAN WERE PREPARED SPECIFICALLY FOR THIS SITE AND SHOULD NOT BE USED ON ANY OTHER SITE WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

**APPROVALS**

By their signature, the undersigned hereby certify that this SHSP has been reviewed and approved for use at OU-1, Sites 4 and 5, NWS - Earle.

Carl Sieppman 1-23-98  
SENIOR PROJECT MANAGER/ENGINEER DATE

Gregory P. Gynn 1/19/98  
PROJECT HEALTH AND SAFETY MANAGER DATE

\_\_\_\_\_  
PROJECT SUPERINTENDENT DATE

\_\_\_\_\_  
SITE HEALTH AND SAFETY OFFICER DATE

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APPENDIX F	WEEKLY HEALTH AND SAFETY REPORT

## 1.0 INTRODUCTION

### 1.1 Purpose

This Site Health and Safety Plan (SHSP) addresses the health and safety practices that will be employed by all site workers participating in the work at the Naval Weapons Station - Earle located in Colts Neck, New Jersey. The SHSP takes into account the specific hazards inherent to the tasks and presents minimum procedures to be followed by Foster Wheeler Environmental Corporation, its subcontractors, and all other on-site personnel in order to avoid and, if necessary, protect against health and/or safety hazards. All activities performed under this SHSP will comply with OSHA Regulations 29 CFR Parts 1910 and 1926, and the Foster Wheeler Environmental Corporation Health and Safety Program Manual. Many programs from the manual are referenced in this SHSP but are not included. A copy of the manual will be maintained at the site. Modifications to the SHSP may be made with the approval of the PHSM using the Field Change Request Form found in Appendix A.

### 1.2 Scope

This SHSP has been developed to address health and safety concerns relative to the removal action to be undertaken at the OU-1 Sites 4 and 5, NWS - Earle.

#### 1.2.1 Objectives

The objective of the remedial action is the capping of Site 4 and Site 5 Landfills to prevent the release of landfilled waste materials into the environment and to reduce rainwater infiltration and associated leachate generation.

#### 1.2.2 Project Description

The following is a list of work activities for the Site 4 and Site 5 Landfills:

- TASK - Support Zone Construction and General Site Mobilization. Temporary construction offices and facilities, lay down, staging and material storage areas, stabilized construction entrances, assess roads and ramps, and haul roads will be installed. Facilities will include an office trailer, a craft trailer at each site, two or more storage containers, and portable toilets. Utility connections will be made. The "Boy Scout Area" has been chosen for the location of the office trailers. All operations associated with this task are considered clean. The initial LOP for this task is Level D.
- TASK - Site Preparation - Erosion and sediment Controls. Prior to site disturbance, the perimeter soil erosion and sediment control devices will be constructed. Channels and berms will be constructed to direct surface water to the sediment basins. Channels, berms and basins will be constructed before the sites are cleared and grubbed.

- TASK - Clearing and Grubbing and Topsoil Removal. Clearing and grubbing will be performed in areas within the limits of disturbance. Clearing and grubbing debris will be chipped and used as mulch for wetlands restoration or will be disposed off-site. Topsoil will be stripped from clean areas and stockpiled for later use. The initial LOP will be Level D.
- TASK - Demolition of Skeet Range. On Site 5, existing structures, facilities, utilities, paved areas, and other items associated with the existing Skeet Range will be removed and disposed; on Site 4, an existing water line will be abandoned in place. Asbestos materials are associated with this pipe. The pipe will be abandoned in place by covering pipe with topsoil. No ACM materials will be handled or disturbed. The initial level of protection for Site 5 demolition will be Level D. The NJDEPE received a copy of the FWENC work plan which described our intent to abandon the ACM pipe in place.
- TASK - Skeet Range remediation. Removal of soils in the target flight zone path will be performed in modified Level D. Dust monitoring will be performed. Demolition tasks not involving potential exposure to lead will be performed in Level D.
- TASK - Monitoring Wells. Existing monitoring wells will be abandoned to accommodate Landfill Cap System. Existing monitoring wells will be modified by extending the casings to final grade. Initial Level of Protection for Well abandonment will be Modified Level D.
- TASK - Storm Drainage System. Surface drainage of the landfill caps is provided by a system of channels and culverts, which are part of the erosion and sediment controls. Additional temporary culverts are required at haul road/drainage channel crossings and will be designed in the field and constructed of corrugated HDPE pipe. Initial Level of Protection will be Level D.

Providing surface drainage during construction will be done by installing the perimeter channels early in the construction phase, which will provide pathways for diverting stormwater to the basins and the temporary channel for discharge into the wetlands. The initial level of protection for this task is Level D.

- TASK - Landfill waste material excavation. Within the "limits of re-graded waste," landfill waste material will be cut and filled as required to achieve the sub-grade. Landfill waste material extending laterally beyond these limits will be excavated and placed within the limits. It is not anticipated that dewatering or shoring will be required to accomplish the landfill cap construction or landfill waste material excavation. Excavation will be performed to the visual limits of waste in the indicated areas. Removed landfill waste material will be incorporated into the landfill within the "limits of regraded waste." Select fill will be used to bring the subgrade to design grade. Initial level of protection for this task will be Modified Level D.

- TASK - Ordnance related materials. Areas of excavation include areas where inert ordnance shells have been identified during test pitting operations (1997). Site personnel will be trained to recognize ordnance materials. Ordnance materials will not be handled by FWENC site personnel. Work will be coordinated with Navy Explosive Ordnance Disposal personnel who will be responsible for removal and disposal of ordnance materials, should any be encountered. This task is associated with landfill waste material excavation and will be performed in modified Level D.
- TASK - Gas management piping. Gas management piping and gas vents will be installed as shown on Drawings C-6 and C-13. Installation of piping and gas vents within the limits of the landfill cap will be performed in modified Level D.
- TASK - Final cover system subgrade preparation. The final cover system subgrade will be constructed to design grade. Landfill waste material is potentially contaminated and work will be conducted in modified Level D.
- TASK - Final cover system. The final cover system comprises a bedding/gas management layer, a very flexible polyethylene (VFPE) geo-membrane, a drainage layer, woven and non-woven geo-textiles, riprap, a select fill layer and, depending upon the proposed use of the cap, either topsoil and turf or a base course and a bituminous concrete or aggregate surface course. Soil materials will be obtained from off-site sources. The initial layer of bedding will be installed in modified Level D. Once contact with contaminated material or atmospheres is eliminated, work may proceed in Level D. Installation of cap materials in proximity of gas vents will require real-time air monitoring.
- TASK - Site restoration. Site restoration will consist of the removal of temporarily constructed features, such as haul roads and staging and material lay-down areas, removal of temporary sedimentation and erosion control features, restoration of areas to their original or design conditions, general site clean-up, fine grading, and establishment of vegetation in areas that were disturbed by construction activities. This will be a level D activity.
- TASK - Demobilization. Following completion of construction activities, temporary facilities and utilities, personnel, equipment and materials will be removed from the site and the support zone area will be restored. Construction equipment will be decontaminated and/or cleaned before leaving the site.
- TASK - Subcontracted work. Several tasks associated with site activities will be performed by subcontractors. Subcontractors will provide activity hazard analysis to FWENC where applicable. Subcontractors shall comply with all requirements of this Health and Safety Plan. Subcontractors are anticipated to perform the following activities:
  - clearing and grubbing
  - electrical work

- geomembrane testing
- off-site transportation
- cast-in-place concrete work
- paving
- seeding and planting

Foster Wheeler will self-perform all other work.

### **1.3 Application**

The SHSP applies to all personnel involved in the removal action who wish to gain access to active work areas, including but not limited to:

- Navy representatives
- NJDEP, EPA and other regulatory personnel
- Foster Wheeler Environmental and subcontractors
- Subcontractors will provide activity hazard analysis

### **1.4 Summary of Major Risks**

The SHSP has been developed to address the following major risks during the installation of landfill caps at OU-1, Sites 4 and 5, NWS-Earle.

- Exposure to chlorinated hydrocarbon contaminated soil during waste excavation activities
- Lead in soil at skeet range
- Possible presence of asbestos in landfills 4 and 5
- Falls into excavations
- Construction hazards during waste excavation and cap installation activities
- Explosive atmospheres during well abandonment and extension
- Explosion due to UXO

## **2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES**

This section specifies the Foster Wheeler Environmental Project Organization, inclusive of subcontractors. Foster Wheeler Environmental will manage the project.

### **2.1 Senior Project Manager/Engineer (SPM/E)**

The Project Manager is Carl Tippmann.

- Has the overall responsibility for the health and safety of site personnel
- Ensures that adequate resources are provided to the field staff to carry out their responsibilities as outlined below
- Participates in periodic inspections

## **2.2 Project Superintendent**

The Project Superintendent is Dan Sullivan.

- Ensures that the Site Health and Safety Plan is implemented in conjunction with the designated PHSM and SHSO
- Ensures that field work is scheduled with adequate personnel and equipment resources to complete the job safely
- Ensures that adequate telephone communication between field crews and emergency response personnel is maintained
- Ensures that field site personnel are adequately trained and qualified to work at the site
- Enforces site health and safety rules
- Investigates major incidents
- Conducts periodic site inspections
- Contacts emergency response organizations

## **2.3 Program Health and Safety Manager (PHSM)**

The PHSM is an individual certified by the American Board of Industrial Hygiene (CIH) or the Board of Certified Safety Professionals (CSP) with experience in hazardous waste site remediation activities.

The PHSM for the site is Grey Coppi.

- Provides for the development and approval of the SHSP
- Serves as the primary contact to review health and safety matters that may arise
- Approves revised or new safety protocols for field operations
- Coordinates revisions of this SHSP with field personnel
- Assists in the investigation of major accidents
- Conducts periodic inspections for compliance with the SHSP

## **2.4 Site Health and Safety Officer (SHSO)**

The SHSO for the site is John Carroll.

- Directs and coordinates health and safety monitoring activities
- Ensures that proper personal protective equipment is utilized by field teams
- Conducts and documents daily safety briefings
- Monitors compliance with this SHSP
- Notifies PHSM of all accidents/incidents
- Coordinates with the CS and PM in any accident/incident investigation
- Completes and maintains Accident/Incident Report Forms
- Determines upgrade or downgrade of personal protective equipment (PPE) based on site

- conditions and/or Real-Time monitoring results
- Ensures that monitoring instruments are calibrated
- Reports to PHSM to provide summaries of field operations and progress
- Establish communications with the NOSC/NOSCDR, the LEPC and other emergency response providers
- Maintains health and safety field log books
- Also serves as craft supervisor

### **3.0 SITE HISTORY AND PROJECT DESCRIPTION**

#### **3.1 Location**

NWS-Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,248 -acre Main Base (Mainside) area, located inland, and the 706-acre Waterfront area. See the Site Vicinity and Project Location Maps, figure 3-1 and 3-2, respectively. The two areas are connected by a navy-controlled right-of-way. Commissioned in 1943, the facilities primary mission is to supply ammunition to the naval fleet. Operable Unit 1 (OU-1) consists of two former landfills located in the Mainside area.

#### **3.2 Background and Site Description**

Site 4 is a 3-acre landfill that received approximately 10,200 tons of mixed domestic and industrial wastes from 1943 until 1960. Materials disposed in the landfill include metal scrap, construction debris, pesticide and herbicide containers, paint residue, and rinse waters. It has been reported that containers of paint, paint thinners, varnishes, shellacs, acids, alcohols, caustics, and asbestos may have also been disposed in the landfill. The landfilled materials are currently covered by a thin layer of sandy soil.

Site 5 is a 5-acre landfill that received approximately 6,600 tons of mixed domestic and industrial wastes between 1968 and 1978. Wastes include paper, glass, plastic, construction debris, pesticide and herbicide containers, containers of paint, paint thinners, varnishes, shellacs, acids, alcohols, caustics, and small amounts of asbestos. The landfilled materials are currently covered by a sand and vegetated soil layer ranging in depth from 1 to 3 feet. Approximately 2.5 acres of the site are used as a skeet shooting range.

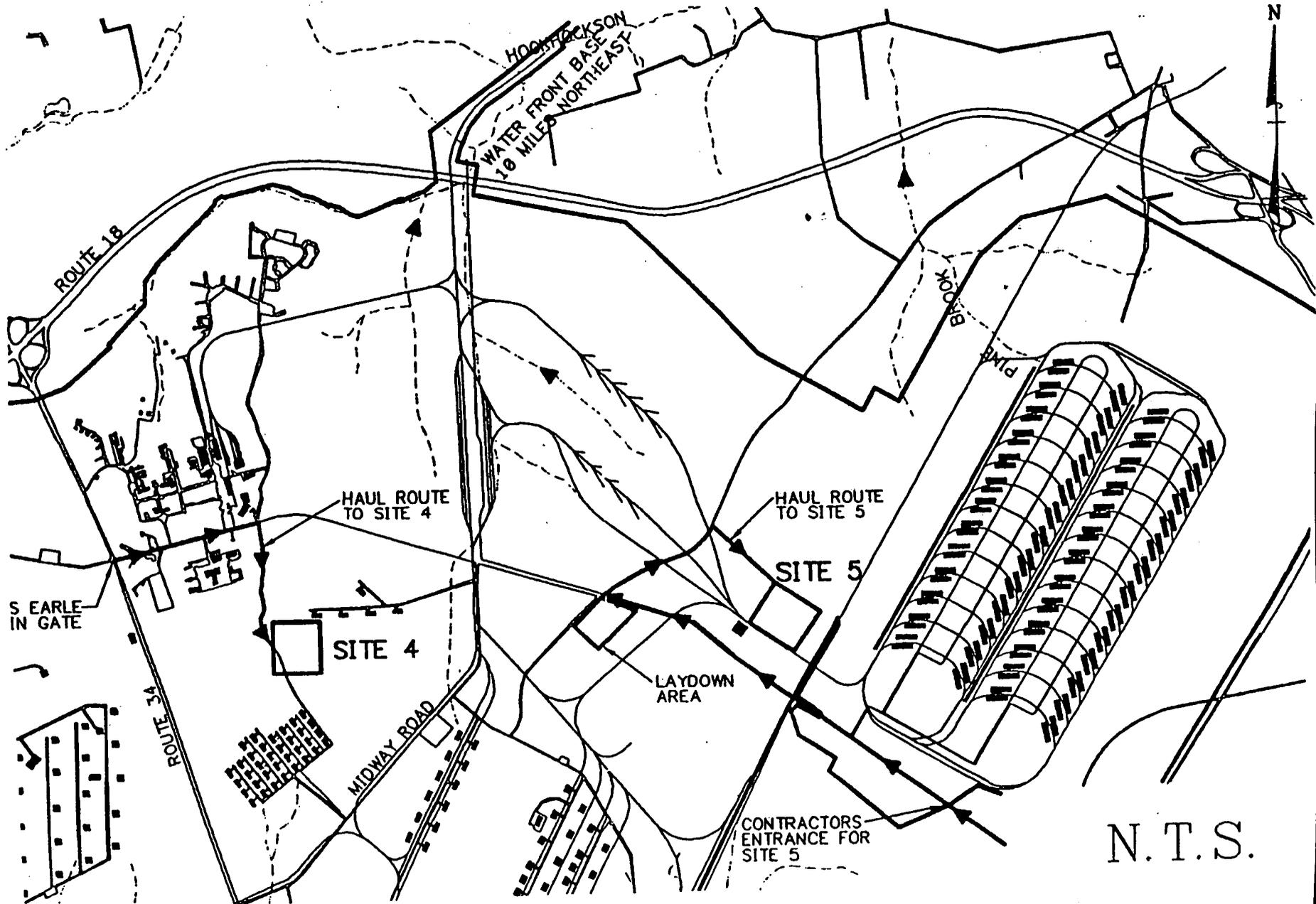
The trap/skeet shooting facility (Shooters Club) is located on top of the landfill at Site 5. The Shooters Club consists of concrete walkways leading to shooting stations, various small structures which house target throwing equipment, wooden light standards with the associated lights for night shooting, and other small ancillary items (gun racks, flagpole).

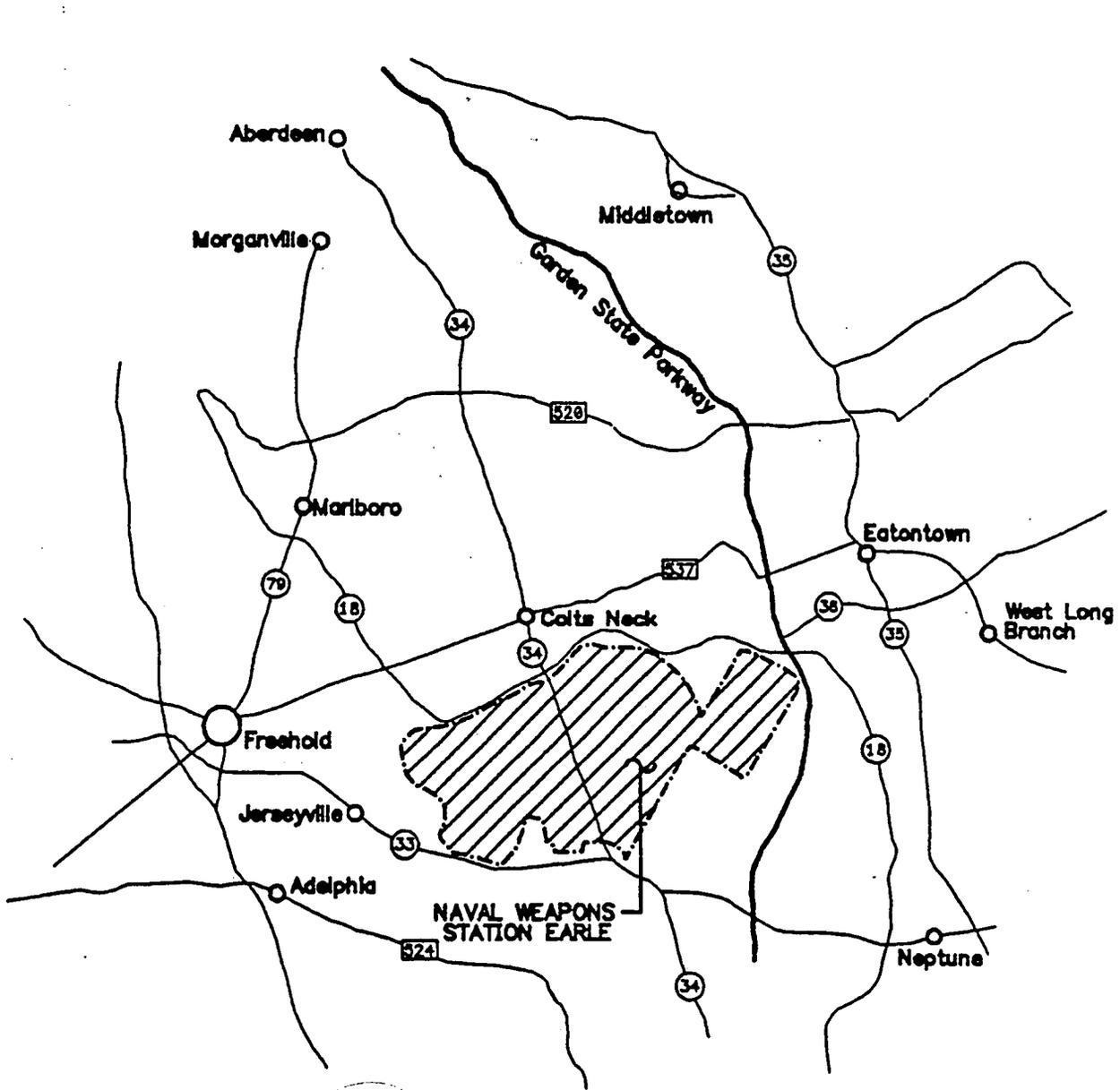
Also included at the facility is a clubhouse which consists of a mobile home approximately 60 feet by 12 feet and a wooden deck approximately the same size. Two large vaults are installed within the clubhouse and are used to store guns, ammunition, and related equipment used during shooting events. The clubhouse includes a sink and restroom facilities.

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PROJECT LOCATION  
US NAVY RAC  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY





N.T.S.

PLOT DATE DEC 1997 D:\EarleLandfill\Fig1-2



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CORPORATION**

**SITE VICINITY  
US NAVY RAC  
NAVAL WEAPONS STATION EARLE  
COLTS NECK, NEW JERSEY**

Figure 3-1  
Page 8

Electric service to the Shooters Club is provided by an underground electric line (100 Amp, single phase) which was trenched through the landfill and passes beneath the railroad tracks south west of the clubhouse. Underground electric lines run to the light poles and range equipment.

Adjacent to Site 5 is an Explosive Ordnance Demolition (EOD) facility. This facility is mission critical. All EOD operations take priority over any construction operation. Routine use will be scheduled with Foster Wheeler Environmental, however, emergency requirements for EOD will cause construction work stoppage.

### **3.3 Nature and Extent of Contamination**

In 1990, NWS-Earle was placed on the National Priorities List (NPL), which is a list of sites where uncontrolled hazardous substance releases may potentially present serious threats to human health and the environment. Phase I Remedial Investigation (RI) activities were conducted by Brown and Root Environmental. A Phase II RI by Brown and Root Environmental determined the nature and extent of contamination at these sites. Activities included installation and sampling of groundwater monitoring wells, sediment sampling, and surface and subsurface soil sampling. The Phase II RI was initiated in 1995 and completed in July 1996 when the final Phase II RI report was released. Only groundwater monitoring results were provided by Brown and Root in their report.

#### **Summary of Remedial Investigations**

A series of remedial investigations were conducted to determine the nature and extent of contamination on Sites 4 and 5. Brown and Root Environmental concluded that groundwater in the vicinity of each site was impacted by metals and organic compounds. A feasibility study was later conducted to determine potential remedial actions for the sites. The selected remedial actions were presented in the Proposed Plan for OU-1, dated March 1997. The Proposed Plan selected capping as the preferred remedial alternative, consistent with the EPA presumptive remedy for municipal landfills at military installations. The Record of Decision for OU-1, dated July 1997, selected capping as the remedial action for Sites 4 and 5.

#### **Phase I RI**

Brown and Root Environmental's Phase I RI detected TCE (55ug/L), and vinyl chloride (3ug/L) in groundwater. Aluminum, iron and manganese were detected during groundwater sampling. Analytical data was not provided in the Brown and Root report for soils or sediments.

#### **Phase II RI**

Brown and Root Environmental's Phase II RI detected the presence of VOCs, including 1,2-dichloroethene (1,2-DCE) 3ug/L, trichloroethene (TCE) 55ug/L, and benzene, 2ug/L. A single SVOC, nitrobenzene, was also detected at an elevated level (66.0 ug/kg) in a sediment sample.

Elevated levels of metals, including aluminum, iron, lead, and manganese, and trace levels of pesticides, including aldrin and dieldrin, were detected in surface water samples. Metals found in groundwater at concentrations greater than regulatory guidelines included aluminum, cadmium, iron, manganese, nickel, and thallium.

According to the Brown and Root report, four of the eight well samples collected met the sample collection endpoint turbidity goal and the others had reasonably low endpoint turbidity values. Therefore, no probable general correlation exists between turbidity and groundwater samples metal concentration above regulatory standards or background. Analytical data was not provided for soil or sediment sampling.

Table 3-1 summarizes the results of groundwater sampling of Site 4 and Site 5.

**TABLE 3-1  
CONTAMINANT DATA SUMMARY**

CONTAMINANT	MEDIA (DEPTH)	LOCATION	FREQUENCY OF DETECTION	CONTAMINANT CONCENTRATION
Benzene	Groundwater	Site 5 05GW06	1/8	2 ug/L
1,2-Dichloroethene	Groundwater	Site 5 05GW06	1/8	3 ug/L
Trichloroethene	Groundwater	Site 4 04-GW05	1/6	55 ug/L
Trichloroethene	Groundwater	Site 5 05GW02, 05, 06	3/8	3-55 ug/L
Vinyl Chloride	Groundwater	Site 4 04GW02	1/6	3 ug/L

#### **Test Pit Investigations - Site 4**

Phase I test pits at Site 4 revealed scrap metal and other construction debris. A second test pit investigation for Site 4 was completed on June 17, 18, and 19, 1997 and included excavation of a total of 24 test pits. A layer of trash ranging in thickness from 6 to 13 feet consisted of metal scrap, concrete, brick and other construction debris. During the test pit investigation, ordnance materials were encountered.

A mix of waste materials was encountered in the test pits within the former landfill boundaries and was composed mainly of municipal/industrial waste materials. Ordnance-type materials were encountered at 04-TP-02 and consisted of various components such as shipping containers and detonator batteries.

#### **Test Pit Investigations - Site 5**

A mix of waste materials was encountered in the test pits within the former landfill boundaries and was composed mainly of municipal/industrial waste materials. Ordnance-type materials were

encountered at 05-TP-29 and included three empty depth charges, shell casings and shipping containers. Unexploded ordnance (UXO) materials were not encountered.

EOD personnel will be available if ordnance materials are encountered and they will inspect the materials and determine the proper method for disposal. FWENC program HS 7-1 shall be implemented on this project.

### **Skeet Range**

Data is not available for the concentrations of lead at the skeet range.

## **4.0 POTENTIAL HAZARDS OF THE SITE AND RISK EVALUATION**

### **4.1 Properties of Chemical Contamination**

The primary Contaminants of Concern (COC) are constituents and break-down products of TCE. The work zones will be monitored continuously during excavation of landfill waste material.

Table 4-1 contains a summary of the toxicological and chemical properties of the compounds that may be encountered during the site activities.

Exposure to the compounds described in Table 4 may occur through inhalation of contaminated dust particles, inhalation of volatile and semivolatiles, dermal absorption, skin contamination, or accidental ingestion of the contaminant.

### **VOCS**

VOC levels for volatile and semivolatile compounds were chosen based upon the known concentrations, physical properties, toxicity, and distribution of these compounds at the site. Due to the vapor pressures of the VOCs, inhalation becomes the primary route of exposure; however, their expected low concentrations presents a low potential exposure to personnel. Skin absorption is also a possible route of exposure, leading to the same symptoms as inhalation overexposure. These chlorinated hydrocarbon compounds are potent narcotics which may cause central nervous system (CNS), lung and blood vessel damage and may have a synergistic effect when combined with alcohol.

**TABLE 4-1  
CHEMICAL DATA**

COMPOUNDS	CAS#	ACGIH TLV	OSHA PEL	ROUTES OF EXPOSURE	SYMPTOMS OF EXPOSURE	TARGET ORGANS	PHYSICAL DATA
Benzene	71-43-21	10 ppm	1 ppm	INH, ING, CON	Irritated eyes, nose; respiratory system, headaches, nausea (CARC)	Eyes, skin, respiratory system, blood, CNS	MW: 78.1 VP: 75 mm LEL: 1.2% IP: 9.24 eV UEL: 7.8%
Asbestos	1330-21-4	0.5 Fiber/cc	0.5 Fiber/cc	INH, ING, CON	Asbestosis: restricted pulm function, irritated eyes	Respiratory system, eyes (lung cancer)	SOL: Insoluble IP: NA MW: Varies
1,2 dichloroethene	540-54-0	200 ppm	200 ppm	INH, ING, CON	Irritated eyes, resp sys, CNS	skin, liver, lungs, CNS	IP: 11.6eV LEL: 5.6% UEL: 12:8%
Lead	7439-92-1	0.15 mg/m <sup>3</sup>	0.050 mg/m <sup>3</sup>	INH, CON	Weak, insomnia, facial pallor, low weight, kidney disease	Eyes, GI tract, CNS, kidneys, blood	MW: 207 SOL: Insoluble IP: NA
Trichloro-ethylene	79-01-6	50 ppm	100 ppm	INH, CON, ING, ABS	Irritated Eyes, skin, nausea, vomit (CARC)	Eyes, skin, respiratory system, CNS	MW: 131.4 LEL 8% IP: 9.45 eV UEL: 10.5%
Vinyl Chloride	75-01-4	5 ppm	1 ppm	INH, ING	Weak, abdominal pain, enlarged liver	Liver, CNS, blood, respiratory system, lymphatic system, liver cancer	LEL: 3.6% IP: 9.99 eV UEL: 33% MW: 62.5%

**Abbreviations**

CNS = Central Nervous System  
 IP = Ionization Potential  
 LEL = Lower Explosive Limit  
 MW = Molecular Weight  
 PPM = Parts Per Million  
 UEL = Upper Explosive Limit  
 VP = Vapor Pressure

### **Lead**

Metals (lead) present a low to moderate potential for exposure to personnel. The route of exposure to lead is through ingestion or inhalation of dust. The effects include eye and skin irritation, upper respiratory effects and damage to the central nervous and reproductive systems. Metal poisoning may be a cumulative action via ingestion; therefore, smoking, drinking, or eating shall be prohibited in work areas where dust is produced. The exposure potential via inhalation or ingestion is low.

### **ACM**

Asbestos poses a low potential for exposure to site personnel. The routes of exposure are inhalation and ingestion. The effects include asbestosis, mesothelioma and restricted pulmonary function. Asbestos is a known human carcinogen.

At both Site 4 and Site 5, asbestos was believed to have been buried in small quantities, however, Remedial Investigation sampling did not indicate the presence of asbestos in either Site 4 or Site 5 landfill.

A 75 foot length of 8" water line which contains an exposed asbestos insulation runs adjacent to the Site 4 limit of cap. This pipe will be buried in place (with topsoil) undisturbed. The likelihood of exposure to ACM during this task is low.

During the removal of the skeet range building and associated soils, lead may be encountered from the lead contained in bullets and shell casings. The likelihood of exposure to lead during this task is low.

During excavation of landfill waste material, solvents that were detected in groundwater sampling may be encountered in concentrated clusters (i.e., drums, containers, etc.). Inhalation of volatile or semivolatile compounds may occur during invasive operations. Air monitoring for total organic vapors as an indicator of possible chemical exposure will be performed during intrusive activities at the landfill excavation, and during groundwater monitoring well abandonment and extension. Respiratory protection will be used where action levels are exceeded as indicated in Section 7.0.

## **4.2 Biological Hazards**

The project may be mobilized during the spring of 1998 and exposure to deer ticks is possible, however, due to the nature of the project and time of year, there is little potential for workers to come into contact with biological hazards. Deer ticks may contain the bacteria responsible for lyme disease. Personnel working on site in the spring are encouraged to wear insect repellent and use the buddy system to look for ticks on one another.

Personnel on site shall be encouraged to pay particular attention to the identification and avoidance of other biological hazards on site during all phases of work.

### **4.3 Physical Hazards**

#### **4.3.1 Construction Safety Hazards**

Most physical hazards are discussed in the activity hazard analyses (AHA) for the different phases of removal action. Primarily, these are the same as for any construction site. The hazards may arise from poor housekeeping; heavy equipment operation; the use of hand and portable power tools; handling and storage of fuels; the installation and use of electrical power; and use of chain saws, and wood debris chipper.

There is a 100 amp service to the skeet range building which will be de-energized and decommissioned prior to work. There is a propane tank (heating fuel source) which will be removed by a local propane service vendor prior to skeet range building removal. The risk of exposure to physical hazards is moderate during most phases of this task.

#### **4.3.2 Cold Stress**

Cold stress may be a significant potential health hazard during activities which may require the use of personal protective equipment. The Foster Wheeler Environmental Corporation Temperature Extremes Program (HS 4-6) will be followed during cold stress conditions. As stated the, SPM, SHSO and PHSM will devise a site-specific program that will effectively control the hazards of cold stress.

#### **4.3.3 Noise**

Noise is a potential hazard associated with the operation of heavy equipment, power tools, chippers and chain saws. Personnel involved in suspected high noise operations will be required to wear hearing protection such as ear muffs or plugs. The SHSO will determine which operations require hearing protection. All Foster Wheeler Environmental Corporation personnel are included in a hearing conservation program according to FWENC procedure HS 4-4.

#### **4.3.4 Confined Space**

Installation of sump tank and electrical vaults will be required to complete this project. Installation may require confined space permits. All confined space work will be performed according to Foster Wheelers Health and Safety Program Manual , section 6-2.

#### 4.3.5 Excavation/Trenching

If employees are required to enter an excavation that is deeper than 5 feet, adequate cave-in protective measures will be implemented per FWENC procedure HS 6-4. Excavation permits shall be obtained for work on Sites 4 and 5 from NWS-Earle Safety Department. Foster Wheeler Environmental site competent person shall also fill out a daily excavation and soils analysis check list.

### 5.0 ACTIVITY HAZARD ANALYSIS

The AHA is a systematic way of identifying the potential health and safety hazards associated with major phases of work on the project and the methods to avoid, control and mitigate those hazards. The AHAs follow the guidance of the Foster Wheeler Environmental Corporate Program Manual HS 3-5. AHAs for the removal action are included in Appendix B of this SHSP. AHAs have been developed for the following phases of work:

- Mobilization
- Silt fence installation
- Clearing and grubbing
- Gravel road placement
- Storm drainage system, channels, and culverts
- Relocation of skeet range
- Excavation of landfill waste
- Final cover system sub-grade preparation and gas vent installation
- Landfill cap construction
- Site restoration/demobilization

AHAs will be developed for other activities, as necessary, prior to start-up.

The AHAs will be used to train work crews in proper safety procedures during phase preparatory meetings.

### 6.0 PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment (PPE) detailed below represents the hazard analysis and PPE selection required by 29 CFR 1910.132. For the purposes of PPE selection, the PHSM and SHSO are considered competent persons. The signatures on the front of the SHSP constitutes certification of the hazard assessment. For activities not detailed below, the SHSO will conduct the hazard assessment and select the PPE using the form provided in Appendix C and shall certify the assessment by signing the form. PPE selection will be made in consultation with the PHSM. The task specific level of PPE required is described in Appendix B. The following is a list of PPE required for each level of work.

Level D PPE includes the following:

- Work clothes (shirts and pants)
- Gloves work (as needed)
- Steel-toed boots
- Hard hat
- Hearing protection
- Eye protection

Level D modified PPE includes the following:

All of Level D plus:

- Site dedicated coveralls or Tyvek (non-breathable)
- Gloves (inner latex and outer nitrile gloves for petroleum products)
- Rubber steel-toed boots or booties

Level C PPE includes the following:

- All of level D modified PPE and a full face air-purifying respirator with combination organic vapor and high efficiency particulate air cartridge

Level B PPE includes the following:

- All of level D modified PPE and a full face air-supplied respirator with Grade D air combination escape bottle and air line

Level A PPE is not approved for this site.

Modifications for initial PPE selection may be made by the SHSO in consultation with the PHSM. A written justification for downgrades will be provided to the PHSM for approval on a field change request form.

Table 6-1 describes the anticipated task-specific PPE.

TABLE 6-1

PERSONAL PROTECTION EQUIPMENT SELECTION  
(PAGE 1 OF 3)

ACTIVITY: LANDFILL FILL CAP - OU-1 SITES 4 AND 5 NWS - EARLE

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Support Zone Construction General Site Mobilization	HH	SG	STB	LWG	Work clothes	EP when required	Level D
Clearing and Grubbing	HH	SG-MFS	STB	LWG	Kevlar Chapps when operating chain saw	EM	Level D
Chipping Grubbing Debris	HH	SG-MFS	STB	LWG	Site dedicated work clothes	EP when required	Level D
Erosion and Sediment Controls	HH	SG	STB	LWG	Site dedicated work clothes	EP when required	Level D
Site 5 Skeet Range Soil Grading	HH	SG	STB w/ OB	NIT SUR	Tyvek	EP when required	Level C

**TABLE 6-1**

**PERSONAL PROTECTION EQUIPMENT SELECTION  
(PAGE 2 OF 3)**

**ACTIVITY: LANDFILL FILL CAP - OU-1 SITES 4 AND 5 NWS - EARLE**

<b>TASK</b>	<b>HEAD</b>	<b>EYE/FACE</b>	<b>FEET</b>	<b>HANDS</b>	<b>BODY</b>	<b>HEARING</b>	<b>RESPIRATOR</b>
Site5-SkeetRange Building Demo, Relocation	HH	SG	STB	LWG	Work clothes	EP when required	Level D - if not in contact with lead contaminated soil.
Monitoring-well abandonment	HH	SG	STB	LWG	Tyvek or work clothes	EP when required	Level D - upgrade of respiratory protection possible based on real-time air monitoring
Monitoring-well modification	HH	SG - and proper eye protection when cutting or welding	STB	LWG	Work clothes	EP when required	Level D - upgrade of respiratory protection possible based on real-time air monitoring.
Surface draining channel construction. No contact with contaminated material.	HH	SG	STB	LWG	Work clothes	EP when required	Level D

TABLE 6-1

PERSONAL PROTECTION EQUIPMENT SELECTION  
(PAGE 3 OF 3)

ACTIVITY: LANDFILL FILL CAP - OU-1 SITES 4 AND 5 NWS - EARLE

TASK	HEAD	EYE/FACE	FEET	HANDS	BODY	HEARING	RESPIRATOR
Surface Drainage Channel Construction Contact with Contaminated Soil	HH	SG	STB w OB	NIT SUR LWG	Tyvek	EP when required	Level D - upgrade possible based on Real-Time air monitoring.
Landfill Material Excavation	HH	SG-MFS	STB w/ OB	NIT SUR LWG	Tyvek	EP when required	Level D - upgrade possible based on Real-Time air monitoring.
Landfill Cap Construction No contact with contaminated material	HH	SG-MFS	STB w/ OB	LWG	Work clothes	EP when required	Level D
Emergency Response	HH	FF resp.	STB	NIT SUR LWG	Tyvek	N/A	C or B - based on results of air monitoring and compare to action levels
Demobilization	HH	SG	STB	LWG	Work clothes	EP when required	Level D

## 6.1 PPE Abbreviations

### HEAD PROTECTION

HH = Hard Hat

### HEARING PROTECTION

EP = ear plugs

EM = ear muffs

### HAND PROTECTION

Cot = cotton

But = Butyl

LWG = Leather Work Gloves

Neo = Neoprene

Nit = Nitrile

Sur = Surgical

Nit Sur = Nitrile Surgical

### EYE/FACE PROTECTION

APR = Full Face Air Purifying  
Respirator

MFS = Mesh face shield

PFS = Plastic face shield

SG = ANSI approved safety  
glasses with side shields

### BODY PROTECTION

Cot Cov = Cotton coveralls

Poly = Polyethylene coated  
tyvek coveralls

Saran = Saranex coated tyvek  
coveralls

Tyvek = Uncoated tyvek  
coveralls

### FOOT PROTECTION

Neo = Neoprene

OB = Overboot

Poly = Polyethylene coated boot

Rub = rubber slush boots

STB = Leather work boots with  
safety toe

### RESPIRATORY PROTECTION

Level D = No respiratory  
protection required

Level C = Full face air purifying  
respirator with approved  
cartridges

Level B = Full face air supplied  
respirator with escape bottle or  
SCBA

## 7.0 AIR MONITORING

### 7.1 Real-Time Air Monitoring

#### 7.1.1 Work Area

The following Real-Time air monitoring instruments will be available for use during on-site field operations:

- Photo-Ionization Detector, (PID) and/or Flame-Ionization Detector (FID)
- Combustible Gas Indicator (CGI) with oxygen (O<sub>2</sub>) sensor
- Dust Monitor equipped with sunshade
- Vinyl Chloride Detector Tubes

Instrument calibration shall be documented and included in the safety and health log book. All instruments shall be calibrated before and after each daily use in accordance with the manufacturer's specifications. Manufacturers' literature, including operations manual for each piece of monitoring equipment will be maintained on-site by the SHSO for reference.

Organic vapor concentrations shall be measured using the PID/FID during landfill waste excavation, removal of groundwater monitoring wells, extension of groundwater monitoring wells and other invasive operations. The monitoring for organic vapors shall consist of measurements recorded at breathing zone (BZ) height in the area of highest employee exposure. The SHSO will interpret monitoring results using professional judgment. Therefore, the action level criteria (Table 7-1) have been set as flexible guidelines.

**TABLE 7-1  
REAL TIME AIR MONITORING ACTION LEVELS**

<b>AIR MONITORING INSTRUMENT</b>	<b>MONITORING LOCATION</b>	<b>ACTION LEVEL</b>	<b>SITE ACTION</b>	<b>REASON</b>
PID/FID	Breathing Zone	<25 ppm (Non-VC)	No respiratory protection	PEL for TCE is 100 ppm
PID/FID	Breathing Zone	> .5 ppm on FID use VC tubes	Use VC tubes to screen for VC	Poor warning qualities of VC. High odor threshold
VC detector tube	Breathing Zone	>.5 ppm	Level B	No organic cartridge available
PID/FID	Breathing Zone	25 ppm - 250 ppm (Non VC)	Level C	1/2 PEL of TCE is 50 ppm
PID/FID	Breathing Zone	> 250 ppm (Non-VC)	Level B	<1/2 of protection factor for organic cartridge is 500 ppm
Combustible Gas Indicator	Point Source/ Breathing Zone	< 10%	Continue work	Less than 10% of LEL
Combustible Gas Indicator	Point Source/ Breathing Zone	>10%	Stop work: allow to vent	Possible explosive atmosphere
Dust Monitor	Breathing Zone	<2.5 mg/m <sup>3</sup>	No respiratory protection	<1/2 OSHA PEL for respirable dust
Dust Monitor	Breathing Zone	>2.5 mg/m <sup>3</sup>	Level C respiratory protection	1/2 OSHA PEL for respirable dust

Monitoring for combustible gases and oxygen concentration shall be conducted during landfill waste excavation activities. Readings can be modified based on the material excavated. Any modification must be in consultation with the PHSM and be documented on a Field Change Request form.

Monitoring for combustible gases and oxygen concentration shall be conducted prior to and during monitoring well abandonment and extension. Readings will be taken prior to work and at the point source.

Monitoring for total dust will be performed during sket range and associated soil removal and during landfill waste excavation. Readings will be taken to monitor soil/waste excavation in the worker's breathing zone. Table 7-2 describes frequency and location of real-time air monitoring.

**TABLE 7-2**  
**FREQUENCY AND LOCATION OF AIR MONITORING**  
**(PAGE 1 OF 2)**

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Support Zone Construction General Site Mobilization	None	N/A
Clearing and Grubbing	None	N/A
Chipping Grubbing Debris	None	N/A
Erosion and Sediment Control	None	N/A
Site 5- Skeet Range Soil Grading	Dust Monitor	Every 30 minutes - BZ
Drainage Channel Construction	None	N/A
Monitoring Well Abandonment	FID	Prior to start of work - PS
	FID	Every 15-30 minutes - BZ
	Colorimetric tubes for vinyl chloride	Prior to start of work - PS and per Table 7-1
	CGI	Prior to start of work and every 15-30 minutes - PS
Monitoring Well Extension	FID	Prior to start of work - PS
	Colorimetric tubes for vinyl chloride	Prior to start of work - BZ
	CGI	Prior to start of work and every 15-30 minutes - PS
Landfill Material Excavation	FID	Every 15-30 minutes - BZ

**TABLE 7-2  
FREQUENCY AND LOCATION OF REAL-TIME AIR MONITORING  
(PAGE 2 OF 2)**

ACTIVITY	AIR MONITORING INSTRUMENT	FREQUENCY AND LOCATION
Landfill Material Excavation	Colorimetric tubes for vinyl chloride	Per Table 7-1
	CGI	Every 15-30 min-BZ and point source
	DM	Every 30 minutes - BZ
Cap Construction	FID	Prior to start of work (if work is within 30 ft. of gas vent) - Point Source
	FID	Continue to monitor every 15-30 minutes (if work is within 30 ft. of gas vent) - Point Source
	Colorimetric tubes	Prior to start of work (if work is within 30 ft. of gas vent) - PS
Cap Construction - prior to first layer of clean material	FID	Every 30 minutes - BZ
	DM	Every 15-30 minutes - BZ
Emergency Response	FID CGI	Continuous
Demobilization	None	N/A

**7.2 Integrated Air Monitoring**

Integrated air monitoring will be performed for vinyl chloride using charcoal tubes if concentrations at or above .5 PPM are detected with colorimetric detector tubes. Lead-in air personal monitoring shall be performed as described in Table 7-3. The results of these samples will be compared with current OSHA permissible exposure limits. All samples will be personal samples collected in the worker's breathing zone. Table 7-3 describes frequency and location of integrated air monitoring.

**TABLE 7-3  
FREQUENCY AND LOCATION OF INTEGRATED AIR MONITORING**

ACTIVITY OR LOCATION	CONTAMINANT	FREQUENCY	ANALYTICAL METHODS
Landfill waste excavation	Vinyl Chloride	1 per week	NIOSH 1007
Skeet range and associated soil removal	Lead	1 per week	NIOSH 7082

### 7.3.1 General Procedures

General personal monitoring procedures to be followed include:

- Selection of high-risk individuals who are thought to have the highest exposure based on job assignment and observations of the SHSO.
- Air sampling pumps used to collect employee exposure samples shall be calibrated before and after each day. Calibration shall be accomplished using a primary standard calibration system (e.g. electronic calibrator). Results of the calibrations shall be included in the health and safety field logbook and with the exposure report.
- Analysis of samples collected for assessment of employee exposure shall be performed only by analytical laboratories accredited by AIHA.
- Results of the personal exposure assessment shall be provided to the individual, in writing, within five working days after receipt of laboratory reports. Reports to field personnel shall be provide calculated TWA exposures and shall provide comparative information relative to established PELs. The air sampling data sheet and laboratory report is considered a part of employee exposure report. A copy of the employee personal exposure report shall also be included in the project file, and in the employee's medical record for Foster Wheeler Environmental employees. Reports for subcontractor employees will be sent directly to the subcontractor's employer.

### 7.3.2 QA/QC

Quality Assurance/Quality Control. Blank samples will be analyzed at a frequency of one per batch. It will be the SHSO's responsibility to collect all QA/QC samples.

At a minimum, the quality assurance program will include the following:

- Calibration procedures
- Recordkeeping
- Training of field personnel
- Data quality assessment
- Chain of custody
- Auditing procedures

## **8.0 ZONES, PROTECTION AND COMMUNICATION**

### **8.1 Site Control**

Site zones are intended to control the potential spread of contamination throughout the site and to permit authorized individuals into potentially hazardous areas. A three-zone approach will be

utilized, it shall include an Exclusion Zone (EZ), Contamination Reduction zone (CRZ) and a Support Zone (SZ). Specific zones shall be established on the work site when operations begin. Figure 8-1 depicts the anticipated site zones. The following shall be used for guidance in revising preliminary zone designations, if necessary. See Figure 8-1 for layout.

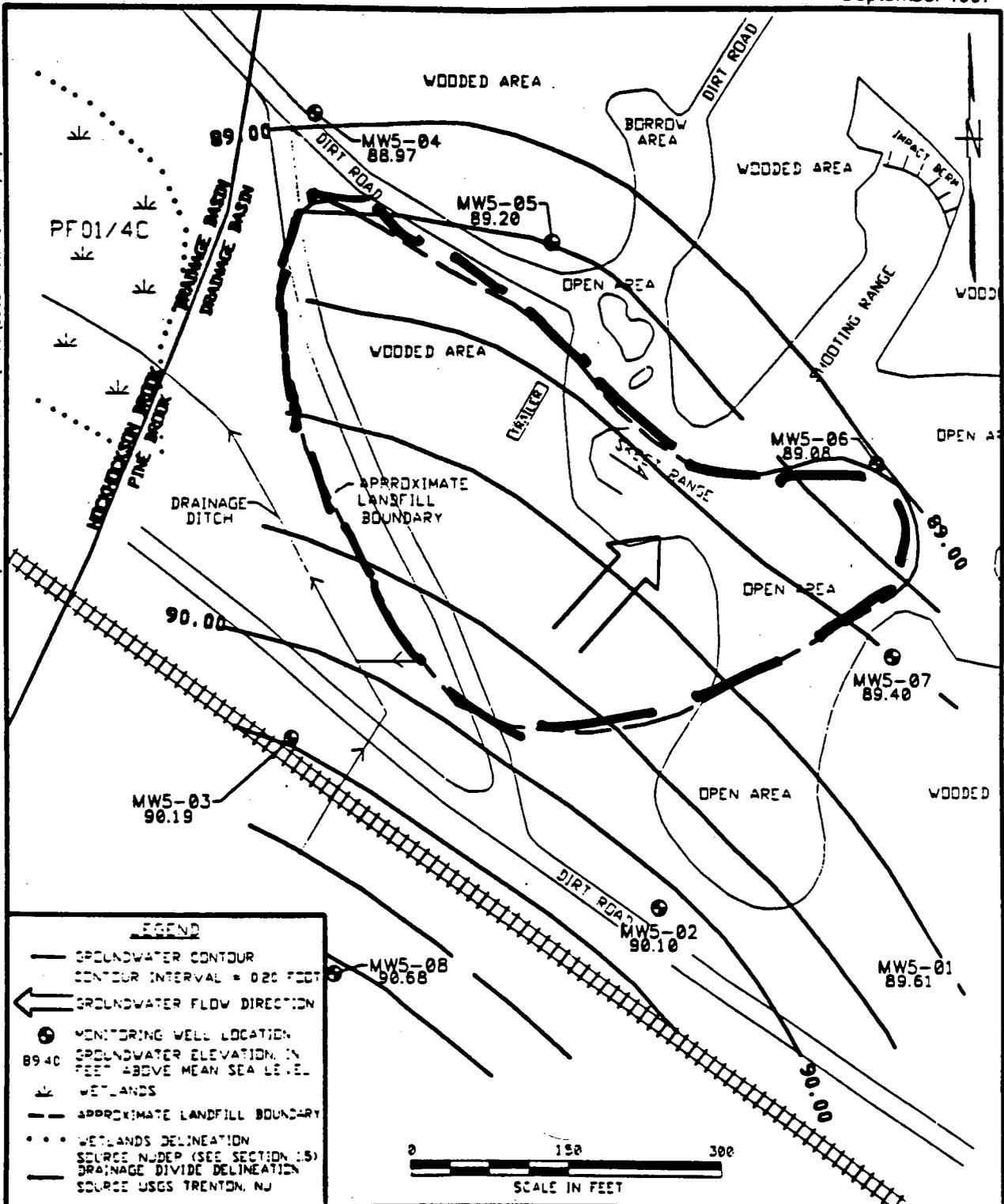
**Support Zone** - The SZ is an uncontaminated area (trailers, offices, etc.) that will be the field support area for most operations. The SZ provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated personnel/materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples.

**Contamination Reduction Zone** - The CRZ is established between the EZ and the SZ. The CRZ contains the contamination reduction corridor and provides for an area for decontamination of personnel and portable hand-held equipment. A personnel decontamination area will be prepared at each exclusion zone. A CRZ will also be prepared for decontamination of tools, heavy equipment, etc., so as not to spread contaminants to other areas. The CRZ will be used for Exclusion Zone entry and egress in addition to access for heavy equipment and emergency support services.

**Exclusion Zone** - All intrusive activities which may involve exposure to hazardous materials and/or conditions should be considered an exclusion zone (EZ). This zone will be clearly delineated by cones, tapes or other means. The SHSO may establish more than one EZ where different levels of protection may be employed or different hazards exist (i.e., drilling crews, waste excavation). The size of the EZ shall be determined by the site SHSO allowing adequate space for the activity to be completed, field members and emergency equipment.

Figure 8-1 depicts the proposed EZ.

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DRAWN BY HJP	DATE 08/25/97	CONTRACT NO. 7602	OWNER NO.
CHECKED BY	DATE	APPROVED BY	DATE
COST/SCHED-AREA		APPROVED BY	DATE
SCALE AS NOTED	<b>GROUNDWATER CONTOUR MAP AUGUST 7, 1995 SITE 5 LANDFILL WEST OF ARMY BARRICADES NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY</b>		DRAWING NO. Figure 8-1
			REV. 0

FORM 6000 III (01/84) (REV. 11/87) - 03/87/97

— — — = EZ

Individuals will only be allowed to access areas of the site relative to their jobs. Any person working in an area where the potential for exposure to site contaminants exists, will be allowed access after providing the SHSO with evidence of proper training and medical documentation.

## **8.2 Contamination Control**

### **8.2.1 Personnel Decontamination Station**

Personnel hygiene, coupled with diligent decontamination, will significantly reduce the potential for exposure.

### **8.2.2 Minimization of Contact With Contaminants**

During completion of all site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from site operations.

Field procedures will be developed to control over spray and runoff and to ensure that unprotected personnel working nearby are not affected.

### **8.2.3 Personnel Decontamination Sequence**

Consideration will be given to prevailing wind directions so that the decontamination line, the support zone, and contamination reduction zone exit is upwind from the exclusion zone and the first station of the decontamination line. Decontamination will be performed by removing all PPE used in EZ and placing in drums/trash cans at CRZ. Baby wipes shall be available for wiping hands and face.

### **8.2.4 Emergency Decontamination**

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination, wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the injured person can be moved, he/she will be moved to the exclusion zone boundary and decontaminated by site personnel as described above before emergency responders handle the victim. If the person can not be moved because of the extent of the injury (a back or neck injury) then poly will be laid down over the work surface and around the victim to allow a clean pathway for response personnel to access the victim. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with poly to eliminate any potential inhalation hazards.

All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent chemical data.

#### 8.2.5 Hand Held Equipment Decontamination

Hand held equipment includes all monitoring instruments, samples, hand tools, and notebooks. The hand held equipment is dropped at the first decontamination station to be decontaminated by one of the decontamination team members. These items must be decontaminated or discarded as waste prior to removal from the exclusion zone.

To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident.

Sampling equipment, hand tools, etc. decontamination procedures can be found in the Work Plan.

#### 8.2.6 Heavy Equipment Decontamination

All contaminated equipment will be decontaminated when switching from a contaminated task to a clean one and before leaving the site. Decontamination procedures may include sweeping, wiping or scraping the exterior of the equipment. Personnel performing this task will wear the proper PPE as prescribed in the HASP.

Decontamination solids will be placed within the “final limits of landfill material” while the subgrade is exposed and before clean landfill cap materials are installed.

### 8.3 **Communication**

The following communications equipment shall be specified as appropriate.

- Telephones - A telephone may be located in the Command Post in the SZ for communication with emergency support services/facilities. Cell phones and two-way radios may be used subject to Navy approval.
- Air Horns - Air horns shall be carried by field teams or be strategically located within the EZ, and shall be maintained as the means for announcing emergency evacuation procedures and backup for other forms of communications.
- No Citizen Band radios are permitted at this site due to the presence of the EOD facility adjacent to Site 5.
- Hand Signals - Hand signals shall be used by field teams along with the buddy system. They shall be known by the entire field team before operations commence and their use covered during site-specific training. Typical hand signals are the following:

<u>Signal</u>	<u>Meaning</u>
Hand gripping throat	Out of air, can't breathe.
Grip on a partner's wrist or placement of both hands around a partner's waist	Leave area immediately, no debate!
Hands on top of head	Need assistance.
Thumbs up	Okay, I'm all right, I understand.
Thumbs down	No, negative.

## **9.0 MEDICAL SURVEILLANCE PROCEDURES**

All contractor and subcontractor personnel performing field work where potential exposure to contaminants exist at the site are required to have passed a medical surveillance examination in accordance with 29 CFR 1910.120(f). A physician's medical release for work will be confirmed by the SHSO before an employee can begin site activities. The examination will be taken annually at a minimum and upon termination of hazardous waste site work if the last examination was not taken within the previous six months. Additional medical testing may be required by the PHSM in consultation with the company physician and the SHSO if an over-exposure or accident occurs, or if other site conditions warrant further medical surveillance.

A medical data sheet is provided in Appendix D. This medical data sheet should be completed by all on-site personnel and kept at the site. Where possible, this medical data sheet will accompany the personnel needing medical assistance or transport to hospital facilities. The medical data sheet will be maintained in a secure location, treated as confidential, and used only on a need-to-know basis.

The Foster Wheeler Environmental Corporate Medical Surveillance Program is described in detail in Section 4.5 of the Health and Safety Program Manual.

## **10.0 SAFETY CONSIDERATIONS**

### **10.1 General Health and Safety Work Rules**

A list of work rules and general safe work practices may be found in the Foster Wheeler Environmental Health and Safety Program Manual, Section 3-6. The work rules will be posted in a conspicuous location at the site.

## **11.0 WASTE DISPOSAL PROCEDURES**

All discarded materials, waste materials or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard or causing litter to be left on site. All potentially contaminated materials, e.g., clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as non-hazardous solid waste.

## **12.0 EMERGENCY RESPONSE PLAN**

This section establishes procedures and provides information for use during a project emergency. Emergencies happen unexpectedly and quickly and require an immediate response; therefore, contingency planning and advanced training of staff are essential. Specific elements of emergency support procedures which are addressed in the following subsections include communications, local emergency support units, preparation for medical emergencies, first aid for injuries incurred on site, record keeping, and emergency site evacuation procedures.

### **12.1 Responsibilities**

#### **12.1.1 Program Health and Safety Manager (PHSM)**

The PHSM oversees and approves the Emergency Response/Contingency Plan and performs audits to determine that the plan is in effect and that all pre-emergency requirements are met. The PHSM acts as a liaison to applicable regulatory agencies and notifies OSHA of reportable accidents and fatalities.

#### **12.1.2 Site Health and Safety Officer (SHSO)**

The SHSO is responsible for ensuring that all personnel are evacuated safely and that machinery and processes are shut down or stabilized in the event of a stop work order or evacuation. The SHSO is required to immediately notify the PHSM of any fatalities or catastrophes (five or more workers injured and hospitalized) so that the PHSM can notify OSHA within the required time frame. The PHSM will be notified of all OSHA recordable injuries, fires, spills, releases or equipment damage in excess of \$500 within 24 hours. The SHSO also serves as the Alternate Emergency Coordinator.

#### **12.1.3 Emergency Coordinator**

The Emergency Coordinator is the Project Superintendent. The emergency coordinator shall make contact with local emergency response personnel prior to beginning work on site. In these contacts the emergency coordinator will inform interested parties about the nature and duration of work expected on the site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. The emergency coordinator shall locate emergency

phone numbers and identify hospital routes prior to beginning work on site. The emergency coordinator shall make necessary arrangements to be prepared for any emergencies that could occur.

The Emergency Coordinator shall implement the emergency response/contingency plan whenever conditions at the site warrant such action. The coordinator will be responsible for prior coordination of the emergency treatment and emergency transport of site personnel as necessary, and notification of emergency response units and the appropriate management staff.

#### 12.1.4 Site Personnel

Site personnel are responsible for knowing the emergency response/contingency plan and the procedures contained herein. Personnel are expected to notify the Emergency Coordinator of situations that could constitute a site emergency.

#### 12.1.5 Rehearsal of the Emergency Response and Contingency Plan

An on-site drill to test the emergency response system shall be conducted during the initial phase of the project. A control group consisting of two on-site personnel will evaluate and critique the drill. Refer to Foster Wheeler HS Procedure 2-1 for guidance on Emergency Preparedness.

The frequency of the drills will be at the discretion of the SHSO.

### **12.2 Communication**

A telephone will be maintained in the office trailer serving as a temporary site office. Air horns will be used to alert site personnel of emergencies. The following signals will be used:

- Two short blasts - shut down equipment, clear radio channels, await instructions
- Three short blasts - injured employee, first-aid providers respond
- One continuous blast - site evacuation

### **12.3 Local Emergency Support Units**

In order to be able to deal with any emergency that might occur during remedial activities at the site, a copy of Table 12-1 will be posted prominently in the field office and in all places where telephone service is available. Base phones will be used whenever possible for emergencies.

**TABLE 12-1  
EMERGENCY TELEPHONE NUMBERS**

<b>Contact</b>	<b>Firm or Agency</b>	<b>Telephone Number</b>
Police	Base	2333 or 732-866-2333
Fire	Base	2333 or 732-866-2333
Hospital	Base Emergency Medical Riverview Medical	2333 or 732-866-2333 Phone: 732-741-2700 Fax: 732-224-7498 Phone: 732-222-5200 Fax: 732-222-5332
Ambulance	Base	2333 or 732-866-2333
ROICC	Tom Dunn	732-866-2515
Environmental Office	Gus Hermanni - Supervisory Environmental Engineer	732-866-2624
PHSM, Grey Coppi	Foster Wheeler Environmental	Work - (215) 702-4079 Home - (908) 274-0394
Poison Control Center		(800) 682-9211
New Jersey Poison Control		(800) 962-1253
National Response Center		(800) 424-9211

Before field activities begin the local fire department will be notified of the schedule so that they will be able to respond quickly and effectively in the event of a fire, explosion, the rupturing of an active gas line, or other emergency.

Foster Wheeler Environmental will provide two people trained in First Aid, Adult CPR and Bloodborne Pathogens on each active work shift at all times.

#### **12.4 Preparation for Medical Emergencies**

Foster Wheeler Environmental will communicate directly with administrative personnel from the emergency room at the hospital in order to determine whether the hospital has the facilities and personnel needed to treat cases of trauma resulting from exposure to any of the contaminants expected to be found on the site. Figure 12-1 shows a route map to Riverview Medical Center.

Instructions for finding the hospital will be posted conspicuously in the site office and in each site vehicle.

#### **12.5 First Aid for Injuries Incurred during Field Work**

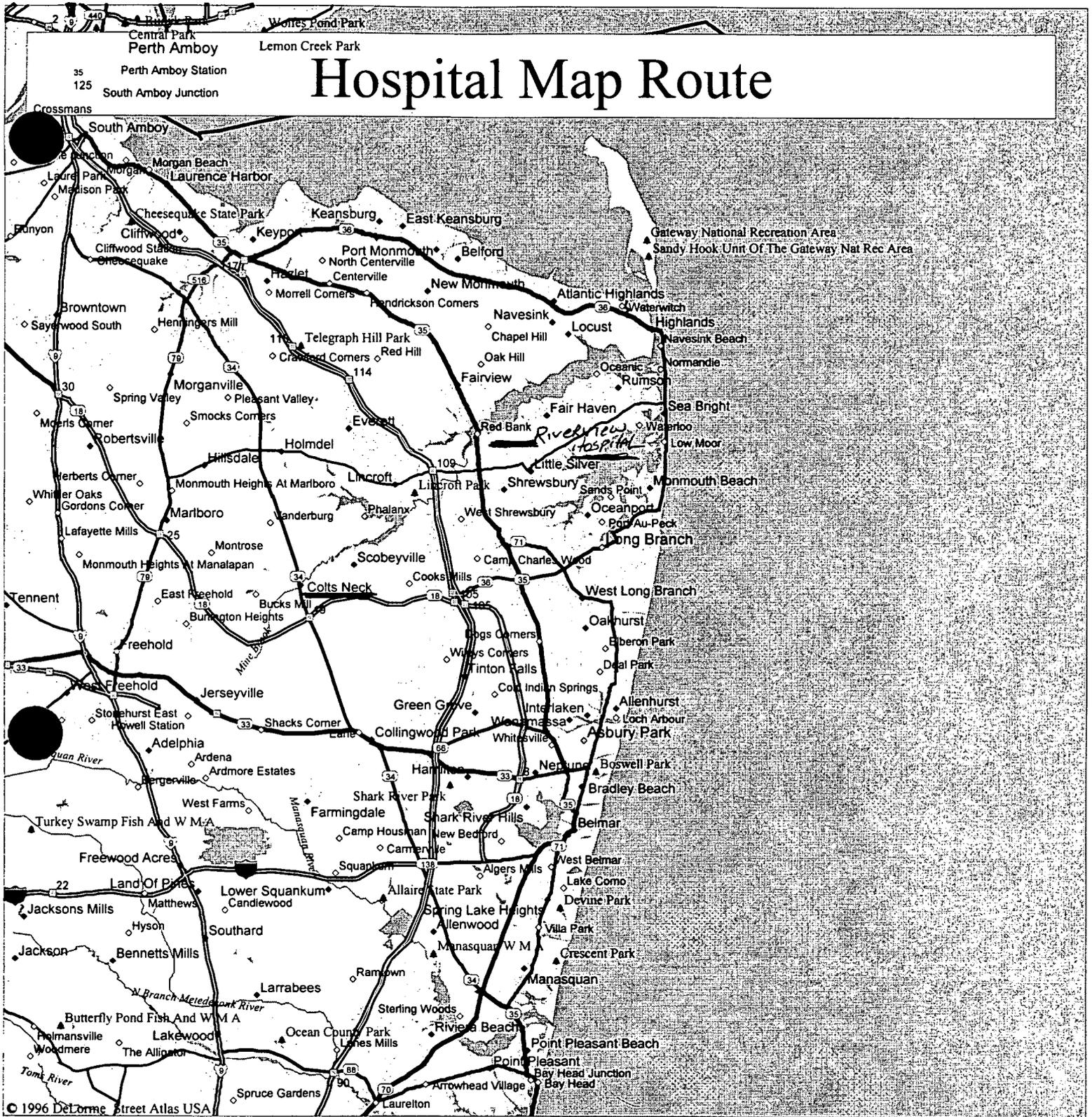
The procedures and rules in this SHSP are designed to prevent employee injury. However, should an injury occur, no matter how slight, it will be reported to the supervisor immediately. First-aid equipment such as first aid kits and emergency eye washes will be available on site at the site office and each active work station. Eye washes must meet ANSI Standard Z358.1-1990 and be capable of delivering 15 minutes of eye wash.

During the site safety briefing, project personnel will be informed of the location of the first aid station(s) that has been set up on-site. Unless they are in immediate danger, injured persons will not be moved until paramedics can attend to them. Some injuries, such as severe cuts and lacerations or burns, may require immediate treatment. First aid instructions received from doctors or paramedics, before an emergency-response squad arrives at the site or before the injured person can be transported to the hospital, will be followed.

#### **12.6 Emergency Site Evacuation Procedures**

In order to mobilize the manpower resources and equipment necessary to cope with a fire or other emergency, a clear chain of authority will be established. The EC will take charge of all emergency response activities and dictate the procedures that will be followed for the duration of the emergency. The EC will report immediately to the scene of the emergency, assess the seriousness of the situation, and direct whatever efforts are necessary until the emergency response units arrive. At his/her discretion, the EC also may order the closure of the site for an indefinite period.

# Hospital Map Route



Mag 11.00  
 Fri Nov 07 12:25 1997  
 Scale 1:250,000 (at center)

5 Miles

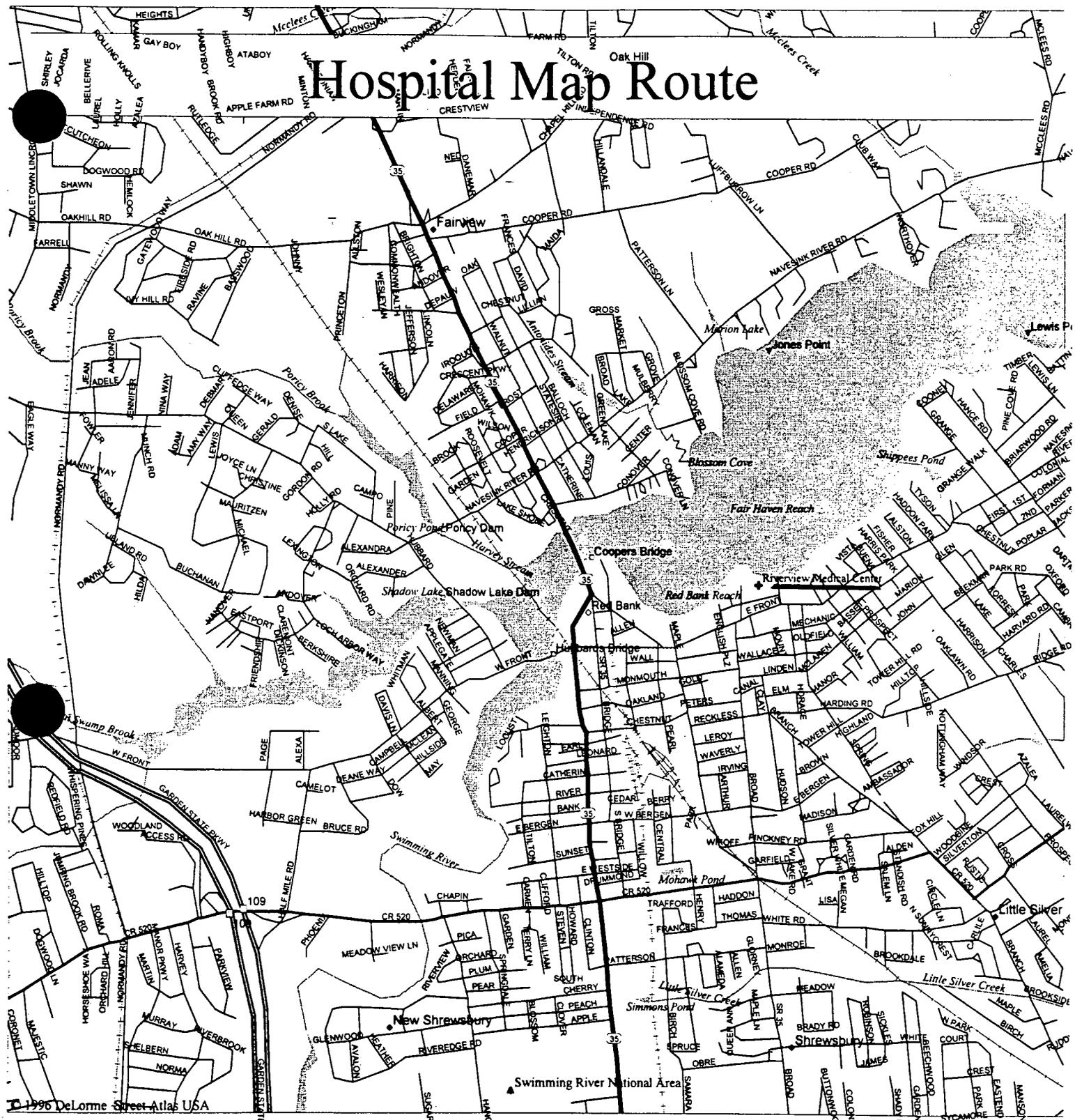
5 KM

- |  |                           |  |                   |
|--|---------------------------|--|-------------------|
|  | Major Connector           |  | Large City        |
|  | State Route               |  | Park/Reservation  |
|  | Primary State Route       |  | Locale            |
|  | Interstate/Limited Access |  | Exit              |
|  | Toll Highway              |  | State Boundary    |
|  | US Highway                |  | Population Center |
|  | County Seat               |  | Lake              |
|  | Small Town                |  | Land              |

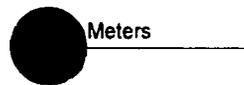
Figure 12-1  
 Page 34

A

# Hospital Map Route



Mag 14.00  
 Fri Nov 07 12:27 1997  
 Scale 1:31,250 (at center)  
 2000 Feet



- Secondary SR/Road/Hwy Ramp
- Major Connector
- Primary State Route
- Toll Highway
- Railroad
- Point of Interest
- Small Town
- Geographic Feature
- Hospital
- Park/Reservation
- Locale
- Exit
- Cemetery
- Population Center
- Water
- River/Canal

Figure 12-1  
 Page 35

B

All project personnel will be instructed on proper emergency response procedures and locations of emergency telephone numbers during the initial site safety meeting. If an emergency occurs, including but not limited to fire, explosion or significant release of toxic gas into the atmosphere, an air horn will be sounded on the site. The horn will sound continuously for approximately 15 seconds, signaling that immediate evacuation of all personnel is necessary due to an immediate or impending danger. Heavy equipment will be shut down and personnel will evacuate the work areas and assemble at the site office, where the EC will give directions for implementing whatever actions are necessary. A project team member will be assigned at the site safety briefing to be in charge of emergency communications. He/she will attend the site telephone specified by the EC from the time the alarm sounds until the emergency has ended.

After sounding the alarm and initiating emergency response procedures, the EC will check and verify that access roads are not obstructed. If traffic control is necessary, as in the event of a fire or explosion, a project team member, who has been trained in these procedures and designated at the site safety meeting, will take over these duties until local police and fire fighters arrive. Appropriate reflective warning vests will be worn by personnel involved with traffic control.

The EC will remain at the site to provide assistance requested by emergency-response squads as they arrive to deal with the situation.

## **12.7 Potential or Actual Fire or Explosion**

Fires will be prevented by adhering to the following precautions:

- Good housekeeping and storage of materials
- Storage of flammable liquids and gases away from oxidizers
- No smoking in the exclusion zone or any work area
- No hot work without a properly executed hot work permit
- Shutting off engines to refuel
- Grounding and bonding metal containers during transfer of flammable liquids
- Fire extinguishers rated at least five pounds ABC located on all heavy equipment, in all trailers and near all welding/cutting activities
- Monthly inspections of all fire extinguishers

In the event of a fire or explosion, procedures will include immediately evacuating the site (air horn will sound for 15 seconds), notification of local fire and police departments and other appropriate emergency response groups. No personnel will fight a fire beyond the stage where it can be put out with a portable extinguisher (incipient stage).

## **12.8 Overt Chemical Exposure**

**SKIN CONTACT:** Use copious amounts of soap and water. Wash/rinse affected areas thoroughly, then provide appropriate medical attention. An emergency eyewash is located in the CRZ. Eyes should be rinsed for 15 minutes upon chemical contamination. Skin should also be rinsed for 15 minutes if contact with caustics, acids or hydrogen peroxide occurs.

**INHALATION:** Move to fresh air. Decontaminate and transport to hospital or local medical provider.

**INGESTION:** Decontaminate and transport to emergency medical facility.

**PUNCTURE WOUND  
OR LACERATION:** Decontaminate and transport to emergency medical facility.

## **12.9 Decontamination during Medical Emergencies**

If emergency life-saving first aid and/or medical treatment is required, normal decontamination procedures may need to be abbreviated or postponed. The site SHSO or designee will accompany contaminated victims to the medical facility to advise on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the injured individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and/or medical personnel. Outer garments may then be removed at the medical facility. An attempt will be made to wash or rinse the victim prior to transporting to a medical facility if it does not cause further injury or delay of treatment. For minor medical problems or injuries, the normal decontamination procedures will be followed.

## **12.10 Accident/Incident Reporting**

As soon as first aid and/or emergency response needs have been met, the following parties are to be contacted by telephone:

1. Grey Coppi, Program Health and Safety Manager - 215-702-4079
2. Carl Tippmann, Project Manager - 215-702-4044
3. The site ROICC is Tom Dunn
4. The employer of any injured worker if not a Foster Wheeler Environmental employee

Written confirmation of verbal reports are to be submitted within 24 hours. The report form entitled "Incident Report" is to be used for this purpose. All Foster Wheeler Environmental

representatives contacted by telephone are to receive a copy of this report. If the employee involved is not a Foster Wheeler Environmental employee, his employer shall receive a copy of the report.

### **12.11 Adverse Weather Conditions**

In the event of adverse weather conditions, the SHSO or designee will determine if work can continue without potentially risking the safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

- Treacherous weather-related working conditions (hail, rain, snow, ice)
- Limited visibility (fog)
- Potential for electrical storms
- Earthquakes
- Other major incidents (explosions)

Site activities will be limited to daylight hours or when suitable artificial light is provided and acceptable weather conditions. Inclement conditions include heavy rain, fog, high winds and lightning. The SHSO will determine the need to cease field operations or observe daily weather reports and evacuate, if necessary, in case of severe inclement weather conditions.

### **12.12 Spill Control and Response**

All small hazardous spills/environmental releases shall be contained as close to the source as possible. Whenever possible, the MSDS should be consulted to assist in determining the best means of containment and cleanup. For small spills, sorbent materials such as sand, sawdust or commercial sorbents should be placed directly on the substance to contain the spill and aid recovery. Any acid spills should be neutralized carefully prior to attempting recovery. Berms of earthen or sorbent materials can be used to contain the leading edge of the spills. Drains or drainage areas should be blocked. All spill containment materials will be properly disposed as hazardous waste. An exclusion zone of 50-100 feet around the spill area should be established depending on the size of the spill.

The following steps should be taken by the Emergency Coordinator:

- Determine the nature and major spill components.
- Make sure all unnecessary persons are removed from the spill area.
- Notify appropriate response teams and authorities.
- Use the PPE selected by the SHSO; selection criteria may be level C or B depending upon the size of spill, activity and VOC air monitoring results. Follow Table 7-1 for guidance.

- If a flammable liquid, gas or vapor is involved, remove all ignition sources and use nonsparking and/or explosive proof equipment to contain or clean up the spill (diesel only vehicles, pumps, etc.).
- If possible, try to stop the leak with appropriate material.
- Remove all surrounding materials that can react or compound with the spill.
- Contact Regulatory Affairs (Tom Teeling) - 215-702-4078

### **12.13 Emergency Equipment**

The following minimum emergency equipment shall be kept and maintained on-site:

- Industrial first aid kit
- Portable eye washes (one per field team); meeting ANSI Z.358.1 1990
- Air horns (one per field team)
- Fire extinguishers (one per trailer/vehicle, trailers and located at hot work stations)
- Spill absorbent material ( speedy dry)

### **12.14 Postings**

The following information shall be posted in each trailer/office and at various, conspicuous locations throughout the site:

- Emergency telephone numbers
- Diagrams showing the location of fire extinguishers and emergency equipment
- Emergency exit and staging area

### **12.15 Restoration and Salvage**

After an emergency prompt restoration of utilities, fire protection equipment, medical supplies and other equipment will reduce the possibility of further losses. Some of the items that may need to be addressed would be:

- Refilling fire extinguishers
- Refilling medical supplies
- Replacing spill absorbents
- Replacing used air horns
- Recharging eye washes

## **13.0 TRAINING**

### **13.1 General Health and Safety Training**

In accordance with Foster Wheeler Environmental corporate policy, and pursuant to 29 CFR 1910.120, hazardous waste site workers shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations unless otherwise noted in the above reference. At a minimum, the training shall have consisted of instruction in the topics outlined in the above reference. Personnel who have not met the requirements for initial training shall not be allowed to work in any site activities in which they may be exposed to hazards (chemical or physical).

In addition to the required initial training, each employee shall have received three days of directly supervised on-the-job training. This training will address the duties the employees are expected to perform. Personnel not involved with the cleanup of contaminated material will not need the training described above to work on the site.

### **13.2 Annual Eight-Hour Refresher Training**

Annual eight-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualifications for field work. The training will cover a review of 1910.120 requirements and related company programs and procedures. In addition, topics deemed necessary by the SHSO or PHSM may be added.

### **13.3 Supervisory Training**

Personnel acting in a supervisory capacity shall have received 8 hours of instruction in addition to the initial 40 hours training.

### **13.4 Site-Specific Training**

Prior to commencement of field activities, all field personnel assigned to the project will have completed training that will specifically address the activities, procedures, monitoring, and equipment used in the site operations. It will include site and facility layout, hazards and emergency services at the site and will highlight all provisions contained within this SHSP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

### **13.5 On-Site Safety Briefings**

Project personnel and visitors will be given daily on-site health and safety briefings by the SHSO, or their designee, to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices or changes in the site's environmental conditions, as well as periodic reinforcement of previously discussed

topics. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits. Prior to starting any new activity, a training session using the Activity Hazard Analysis will be held for crew members involved in the activity.

### **13.6 First Aid and CPR**

It is expected that one field personnel will have first aid training. The training will be consistent with the requirements of the American Red Cross Association and include training on Bloodborne Pathogens.

### **13.7 Hazard Communication**

Hazard communication training will be provided in accordance with the requirements contained in the Foster Wheeler Environmental Health and Safety Program Manual, Section 4-2.

### **13.8 Other**

Lead and asbestos abatement employees shall receive training and provide evidence of certification when required by federal and/or state statute, prior to site arrival.

## **14.0 LOGS REPORTS AND RECORDKEEPING**

The Following is a summary of required health and safety logs, reports and recordkeeping.

### **14.1 Field Change Request**

To be completed for initiating a change to the SHSP. The PHSM and Project Manager or designee approval is required. The original will be kept in the project file. Approved changes will be reviewed with affected field personnel at a safety briefing. Copies may be distributed to the Client Representative.

### **14.2 Medical and Training Records**

Copies or verification of training (40 hour, 8 hour, supervisor, site specific training and documentation of three day OJT) and medical clearance for hazardous waste site work and respirator use will be maintained onsite. Records for all subcontractor employees will also be kept onsite. All employee medical records will be maintained by the Corporate Medical Consultant - Greaney Medical Group in accordance with Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-8.

### **14.3 On-site Log**

A log of personnel on-site each day will be kept by the Project Site Superintendent or designee.

#### **14.4 Health and Safety Reports**

The SHSO shall complete and submit Weekly Health and Safety Reports to the PHSM. The SHSO will submit a Monthly Summary Report to the PHSM. These reports are provided in Appendix G.

#### **14.5 Accident/Incident Reports**

Incident reporting and investigation will follow Foster Wheeler Environmental Corporation Health and Safety Program Manual, section HS 1-7.

#### **14.6 OSHA Form 200**

An OSHA Form 200 will be kept at the project site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to Regional Health and Safety Manager for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 200 form. The incident report form referenced in section 12.11 meets the requirements of the OSHA Form 101(supplemental record) and must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

#### **14.7 Health and Safety Logbooks**

The SHSO will maintain logbooks during site work. The daily site conditions, personnel, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

#### **14.8 Hazard Communication Program/MSDS**

Material Safety Data Sheets (MSDS) will be obtained by procurement or the SHSO for applicable substances and will be included in the site hazard communication file. The hazard communication program will be maintained onsite in accordance with 29 CFR 1910.1200 and Foster Wheeler Environmental Corporation Health and Safety Program Manual Section HS 4-2.

#### **14.9 Work Permits**

All work permits, including confined space entry, hot work, lockout/tagout, and line breaking permits will be maintained in the project files.



## ACTIVITY HAZARD ANALYSIS

Project: <u>NWS-EARLE Landfill Cap, Sites 4 and 5</u>		Location: <u>COLTS NECK, NEW JERSEY</u>
Activity: <u>Abandonment and Extension of Groundwater Monitoring wells</u>		
MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Abandon Groundwater Monitoring Wells (Controls 1-3 apply)	1. Physical Hazards/struck by	1. Stand clear of drill rig/equipment when removing casing; keep in line of sight of operator; work will be performed by qualified operator; personnel will be required to wear hard hats that meet ANSI Standard Z89.1; steel toe boots meeting ANSI Standard Z41 will be worn; safety glasses meeting ANSI Standard Z87 will be worn during all operations.
2. Extend Groundwater Monitoring Wells (Controls 2, 3, 4 apply)	2. Exposure to Chemical Hazards ( Inhalation, Dermal contact) such as TCE, 1,2 DCE	2. Work shall be performed in Poly-coated tyvek, Nitrile inner gloves, nitrile outer gloves, and poly coated boots/boot cover; monitor Head Space of well for presence of VOC's; if VOC's are present, allow well to vent; perform Air-Monitoring per section 7.0 of this HASP; real-time air monitoring will determine Respiratory Protection requirements per section 7.0 of this HASP; for Well Extension, follow Air Monitoring requirements.
	3. Explosion	3. Monitor Head Space of well with CGI; if LEL is above 10%, allow to vent until LEL drops below 10%, then proceed with caution; continue to monitor at regular intervals per 7.0.
	4. Fire	4. Cutting and welding shall be performed by qualified worker; fire watch shall be established for a minimum of 15 minutes after completion of work; a 10 pound ABC fire extinguisher shall be within close proximity to work being performed; if in a possibly contaminated area use site dedicated cotton coveralls; welder/ cutter is not permitted to wear tyvek while performing hot work; use of flashback flame arrestor is required on cutting torch; complete hot work permit; follow FWENC 6-6.
EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Level C PPE, and Level D PPE 2. Drill Rig/ Heavy Equipment 3. Cutting tools/ Welding equipment 4. Real Time Air Monitoring Equipment	1. PPE - prior to use 2. Drill Rig/ Heavy Equipment prior to use 3. Cable rigging on Drill Rig prior to use 4. Cutting tools prior to use 5. Welding equipment prior to use 6. Calibrate pre- and post-use	1. Personnel have read and comply with HASP 2. Site specific training Follow applicable FWENC programs

## ACTIVITY HAZARD ANALYSIS

Project: <u>NWS-EARLE Landfill Cap, Sites 4 and 5</u>		Location: <u>COLTS NECK, NEW JERSEY</u>
Activity: <u>Landfill Cap Construction</u>		
MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Landfill Waste Excavation with excavator and dumpster	1. Chemical exposure to VOCs and UXO	1. 1. Work associated with landfill waste removal will be conducted in accordance with the HASP, 29 CFR 1910.120 and Foster Wheeler H&S Program Manual for Excavation, Section 6-4, and UXO operation, Section 7-1. Air monitoring will be conducted per section 7.0
	2. Falls into excavation	2. Exclusion Zone shall be delineated with survey stakes marked with high visibility paint or traffic cones.
	3. Cave-ins	3. Excavation must be performed under excavation permit. NWS-Earle will issue a permit to Foster Wheeler. The Foster Wheeler designated competent person for excavations must also perform daily excavation inspections, daily soils analysis classifications, and fill out excavation inspection checklists and soils classification checklists daily.
	4. Noise	4. Wear HPD's.
	5. Struck by	1. During landfill waste excavation UXO materials may be encountered. Upon encountering possible UXO material work shall cease, personnel will exit work area and NWS-Earle EOD department staff contacted. Foster Wheeler Environmental will not handle any UXO material
		5. Use of back up alarm; markout swing radius; use spotters.
		Side-walls of excavation may be unstable due to the nature of material being excavated. Area surrounding excavation shall be delineated with cones/stakes. Cones/stakes shall be at least 25 feet from excavation and personnel on ground shall remain behind cones/stakes to prevent exposure to fall hazards due to cave-ins.
		Material shall be stockpiles at least 3 ft. from edge of excavation.
EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Trac hoe-966	1. Daily heavy equipment inspection	1. Site-specific training 2. Fall hazard training pertaining to excavations 3. Wear hearing protection 4. Use of back-up alarm; _____ swing radius; use spotters
2. Real-time air monitoring equipment	2. Pre- and post-calibration	
3. Traffic cones, survey stakes	3. Daily excavation inspection	
4. Pocket penetrometer	4. None	
5. Modified Level D PPE	5. Prior to use	
6.	6.	

## ACTIVITY HAZARD ANALYSIS

Project: <u>NWS-EARLE Landfill Cap, Sites 4 and 5</u> Activity: Landfill Cap Construction		Location: <u>COLTS NECK, NEW JERSEY</u>	
MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS	
1. Mobilization/Setup of Geo-synthetic liner and related cap components (Controls 1, 2, 3 and 4 apply)	1. Hand Injuries; Slips/Trips/Falls; Back Injuries	1. Kevlar work gloves will be worn when there is a potential for cutting hands (i.e., use of razor knives); no one is permitted on liner without liner foreman approval; handle materials with equipment, and stand clear of materials while loads are suspended or in motion; stay off liner in high winds.	
2. Liner Deployment (Controls 2, 3, 4 and 5 apply)	2. Rigging Failure; liner uplift from wind; pinch, crush hands	2. All slings, chains and ropes will be inspected prior to use and properly rated for the intended load; ballasts (sandbags will be used to keep liner from uplifting in high winds; use leather gloves when handling razor knives; use proper tools recommended by manufacturer when pulling liner into place.	
	3. Possible Exposure to Chemical Hazards (VOCs)	3. Landfill cap area will be considered an exclusion zone and will require a minimum of Modified Level D PPE to enter these areas. Air monitoring will also be performed per Section 7.0 of this HASP; landfills will be brought to grade with on-site materials; then clean fill will be imported from off site to serve as the first sub-grade. Once this material is in place the area may be considered Level D.	
	4. Overhead Hazards, Eye Injuries, Foot Injuries	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; steel toe boots meeting ANSI Standard Z41 will be worn; safety glasses meeting ANSI Standard Z87 will be worn during all operations.	
	5. Possible burns from Liner Welder	5. Liner welder equipment will be handled wearing leather work gloves to prevent burns.	
EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS	
1. Modified Level D PPE, with possible upgrade to Level C 2. Crane or other suitable lifting equipment 3. Rigging 4. Air monitoring equipment 5. Leather Gloves	1. Inspection of rigging 2. Inspection of crane or equipment to be used for lift 3. Daily inspection of heavy equipment	1. Personnel have attended site-specific training and comply with HASP 2. Review of razor knife hazards 3. Review of hazards associated with synthetic liner work (slips, trips, falls)	

## ACTIVITY HAZARD ANALYSIS

Project: <u>NWS-EARLE Landfill Cap, Sites 4 and 5</u>		Location: <u>COLTS NECK, NEW JERSEY</u>
Activity: <u>Relocation of Skeet Range Building and grading of related soils</u>		
MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
1. Relocate Skeet Building ( controls 1, 2, 4 apply)	1. Lift Failure	1. Critical Lift Plan shall be developed and reviewed with all personnel prior to lift; qualified operator shall perform lift; all rigging shall be rated suitable and inspected by qualified person prior to lift
2. Grading soil associated with Skeet range (possible lead contamination) (controls 3, 4 apply)	2. Struck by	2. Spotters shall be used when moving building; workers shall not be permitted to work/ walk under suspended loads
	3. Possible Exposure to Chemical Hazards (Lead)	3. Modified Level D PPE shall be worn. Dust monitoring shall be performed
	4. Overhead Hazards, Eye Injuries, Foot Injuries	4. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; steel toe boots meeting ANSI Standard Z41 will be worn; safety glasses meeting ANSI Standard Z87 will be worn
EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
1. Modified Level D PPE 2. Crane or other suitable lifting equipment 3. Rigging 4. Dust Monitor 5. Dozer	1. Prior to use 2. Inspection of crane 3. Inspection of rigging prior to lift 4. Pre- and post-calibration reference 5. Daily inspection of heavy equipment	1. Personnel have read and comply with HASP 2. Site specific training 3. Critical Lift Plan Shall be reviewed

## ACTIVITY HAZARD ANALYSIS

Project: Landfill Cap Sites 4 and 5		Location: <u>Colts Neck, New Jersey</u>
Activity: Site Mobilization , Clear and Grubb, Gravel Road Placement		
MAJOR STEPS	POTENTIAL HAZARDS	PROTECTIVE MEASURES/CONTROLS
Mobilize Equipment, Supplies and Trailer (Controls 1-5 apply)	1. Back Injuries	1. Site personnel will be instructed on proper lifting techniques; mechanical devices should be used to reduce manual handling of materials; use tandem lifting.
Silt Fence Installation (Controls 1, 2 , 5, 6, 7 apply)	2. Eye, foot, head injuries	2. Personnel will be required to wear hard hats that meet ANSI Standard Z89.1; personnel will be required to wear safety glasses that meet ANSI standard Z 87; steel toe boots meeting ANSI Standard Z41 will be worn.
Clearing and Grubbing ( Controls 2, 7, 9 apply)	3. Vehicular Traffic, struck by	3. Spotters will be used when backing up heavy equipment; back-up alarms shall be installed on all heavy equipment
Gravel Road Placement (Controls 2, 3, 8 apply)	4. Electrocutation	4. Electric service installation shall be performed by qualified electrician
Use of Chain Saw and Chipper (Controls 1, 2, 6, 7, 9 and 10 apply)	5. Striking underground utilities, explosion, electrocutation	5. All underground utilities will be identified prior to intrusive activities; excavation permits will be obtained from base services prior to intrusive activities
	6. Hand injuries	6. Hand protection shall be used when installing silt fence
	7. Eye injuries from flying debris	7. Qualified personnel shall be instructed on proper use of power/mechanical trenching devices; chipper shall have neutral safety bar; bar shall be inspected daily to ensure proper function; debris shall be fed to chipper in correct manner according to manufacturer's specifications; chipper shall be properly de-energized and locked-out prior to maintenance/repair/clearing of stuck debris; safety glasses worn; face guard.
	8. Heavy Equipment (rollovers, struck by or against)	8. Personnel shall stand clear of tip areas of trucks delivering stone to site; personnel shall not stand next to stone delivery trucks when tipping; stone shall be dumped on a firm level area to minimize truck tipping hazard
	9. Noise	9. Personnel shall wear proper PPE when operating chain saw. and chipper (i.e. standard Level D PPE with ear muffs, mesh face shield, <i>Kevlar chaps {when operating chain saw}</i> , and leather work gloves); Only qualified personnel shall operate chain saw and chipper
	10. Caught in	10. Properly functioning safety devices on chipper; feed branches first
EQUIPMENT USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ol style="list-style-type: none"> <li>1. Backhoe, 966 hoe, Dozer, Dump Trucks</li> <li>2. Level D PPE</li> <li>3. Chain Saw, Debris Chipper</li> <li>4. Kevlar chaps, Leather work gloves</li> <li>5. Ditch Witch ( silt fence installation)</li> </ol>	<ol style="list-style-type: none"> <li>1. Inspections will be performed on heavy equipment initially and daily</li> <li>2. Inspections will be performed on power tools initially and daily</li> <li>3. Initial and daily inspection of PPE</li> </ol>	<ol style="list-style-type: none"> <li>1. Site specific training</li> <li>2. Qualified operators will be used for heavy equipment operation</li> <li>3. Qualified operators will be used for chain saw, debris chipper operation</li> </ol>

## 16.0 REFERENCES

American Conference of Governmental Industrial Hygienists, Inc., 1992, Documentation of The Threshold Limit Values and Biological Exposure Indices; 6th Ed., ACGIH, Cincinnati, Ohio.

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Foster Wheeler Environmental Corporation, Foster Wheeler Environmental Corporation Health and Safety Manual, 1995.

NIOSH/OSHA/USCG/EPA, 1985, Occupational Safety and Health, Guidance Manual for Hazardous Waste Site Activities; October 1985.

Sax, N. Irving, 1992, Dangerous Properties of Industrial Materials, 8th Ed; Van Nostrand Reinhold Co. Inc., New York, NY.

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U.S. Environmental Protection Agency, Standard Operating Safety Guides; 1992.

U.S. Environmental Protection Agency, no date, Response Safety Decision-Making; Course manual, Office of Emergency and Remedial Response, Hazardous Response Support Division.

Phase II Comprehensive Site Assessment Report, Fuel Farm Naval Air Station South Weymouth, Northern Division Naval Facilities Engineering Command, January 1997, Brown and Root Environmental.

**APPENDIX A**  
**FIELD CHANGE REQUEST FORM**

**FOSTER WHEELER ENVIRONMENTAL  
FIELD CHANGE REQUEST FORM**

PROJECT: \_\_\_\_\_

CHANGE NUMBER: \_\_\_\_\_

PROJECT LOCATION: \_\_\_\_\_

DESCRIPTION OF CHANGE: \_\_\_\_\_

REASON FOR CHANGE: \_\_\_\_\_

RECOMMENDED DISPOSITION: \_\_\_\_\_

SITE MANAGER: \_\_\_\_\_

Signature

DATE

PROGRAM HEALTH AND SAFETY MANAGER:

Signature

DATE

DISTRIBUTION: Program Health and Safety Manager

Site Health and Safety Officer

Quality Assurance Representative

Field Operation Leader



**APPENDIX B**

**ACTIVITY HAZARD ANALYSIS**

**APPENDIX C**  
**PPE SELECTION FORM**

**TABLE 6.1 PERSONAL PROTECTIVE EQUIPMENT SELECTION**

**ACTIVITY:**

<b>TASK</b>	<b>HEAD</b>	<b>EYE/FACE</b>	<b>FEET</b>	<b>HANDS</b>	<b>BODY</b>	<b>HEARING</b>	<b>RESPIRATOR</b>

**APPENDIX D**  
**MEDICAL DATA SHEET**

**FOSTER WHEELER ENVIRONMENTAL  
MEDICAL DATA SHEET**

This brief Medical Data Sheet (MDS) is to be completed by all on-site personnel and will be kept on file by the HSO as a project record during the conduct of site operations. The MDS will accompany personnel if medical assistance or transport to a hospital is required.

The information and signature you provide at the bottom of this form affirms that you understand and will comply with the Health and Safety Plan for Naval Weapons Station-Earle, OU-1, Sites 4 and 5.

SITE: NWS-EARLE OU-1 SITES 4 AND 5

NAME: \_\_\_\_\_ SOCIAL SECURITY: \_\_\_\_\_

AGE: \_\_\_\_\_ HEIGHT: \_\_\_\_\_ WEIGHT: \_\_\_\_\_ BLOOD TYPE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

EMERGENCY CONTACT: \_\_\_\_\_  
(Telephone Number): \_\_\_\_\_

DRUG or OTHER ALLERGIES: \_\_\_\_\_

DO YOU WEAR CONTACTS? \_\_\_\_\_

HAVE YOU EVER BEEN HOSPITALIZED AS A RESULT OF A KNOWN CHEMICAL EXPOSURE? \_\_\_\_\_ DATE OF EXPOSURE \_\_\_/\_\_\_/\_\_\_  
EXPOSURE INFORMATION: \_\_\_\_\_

WHAT MEDICATIONS ARE YOU PRESENTLY USING? \_\_\_\_\_  
\_\_\_\_\_

DO YOU HAVE ANY MEDICAL RESTRICTIONS? \_\_\_\_\_  
\_\_\_\_\_

NAME, ADDRESS AND PHONE NUMBER OF PERSONAL PHYSICIAN:  
\_\_\_\_\_  
\_\_\_\_\_

**APPENDIX E**

**WORK RULES**



# FOSTER WHEELER ENVIRONMENTAL CORPORATION

## GENERAL HEALTH AND SAFETY WORK RULES

1. All site personnel must attend each day's Health and Safety Briefing.
2. Any individual taking prescribed drugs shall inform the HSO of the type of medication. The HSO will review the matter with the PHSM and the Corporate Medical Consultant (CMC), who will decide if the employee can safely work on-site while taking the medication.
3. The personal protective equipment specified by the HSO and the HASP shall be worn by all site personnel. This includes hard hats and safety glasses which must be worn at all times in active work areas.
4. Facial hair (beards, long sideburns or mustaches) which may interfere with a satisfactory fit of a respiratory mask is not allowed on any person who may be required to wear a respirator.
5. All personnel must sign the site log and the exclusion zone log when used at the site.
6. Personnel must follow proper decontamination procedures and shower at the end of the work shift.
7. Eating, drinking, chewing tobacco or gum, smoking and any other practices that may increase the possibility of hand-to-mouth contact is prohibited in the Exclusion Zone or the Contamination Reduction Zone. (Exceptions may be permitted by the PHSM to allow fluid intake during heat stress conditions.)
8. All lighters, matches, cigarettes and other forms of tobacco are prohibited in the Exclusion Zone.
9. All signs and demarcations shall be followed. Such signs and demarcation shall not be removed except as authorized by the HSO.
10. No one shall enter a permit-required confined space without a permit. Confined space entry permits must be followed as issued.
11. All personnel must follow Hot Work Permits as issued.
12. All personnel must use the Buddy System in the Exclusion Zone.
13. All personnel must follow the work-rest regimens and other practices required by the heat stress program.

14. All personnel must follow lockout/tagout procedures when working on equipment involving moving parts or hazardous energy sources.
15. No person shall operate equipment unless trained and authorized.
16. No one may enter an excavation greater than four feet deep unless authorized by the Competent Person. Excavations must be sloped or shored properly. Safe means of access and egress from excavations must be maintained.
17. Ladders and scaffolds shall be solidly constructed, in good working condition and inspected prior to use. No one may use defective ladders or scaffolds.
18. Fall protection or fall arrest systems must be in place when working at elevations greater than six feet for temporary working surfaces and four feet for fixed platforms.
19. Safety belts, harnesses and lanyards must be selected by the Supervisor. The user must inspect the equipment prior to use. No defective personal fall protection equipment shall be used. Personal fall protection that has been shock loaded must be discarded.
20. Hand and portable power tools must be inspected prior to use. Defective tools and equipment shall not be used.
21. Ground fault interrupters shall be used for cord and plug equipment used outdoors or in damp locations. Electrical cords shall be kept out of walkways and puddles unless protected and rated for the service.
22. Improper use, mishandling or tampering with health and safety equipment and samples is prohibited.
23. Horseplay of any kind is prohibited.
24. Possession or use of alcoholic beverages, controlled substances or firearms on any site is forbidden.
25. All accidents, no matter how minor must be reported immediately to the Supervisor.
26. All personnel shall be familiar with the Site Emergency Response Plan.

**The above Health and Safety Rules are non all-inclusive and it is your responsibility to comply with all regulations set forth by OSHA, the FWENC Corporate H&S Manual, the HASP, the client, Foster Wheeler Environmental Supervisors and the HSO.**

**APPENDIX F**

**WEEKLY HEALTH AND SAFETY REPORT**



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**  
**NWS-EARLE SITES 4 AND 5**  
**WEEKLY HEALTH AND SAFETY REPORT**  
 (Page 2 of 2)

**LANDFILL CAP CONSTRUCTION**  
**WEEK ENDING:**

**REAL TIME AIR MONITORING SUMMARY:**

Work Description	FID/PID Range (ppm)	Lower Explosive Limit (%LEL)	Oxygen (%O <sub>2</sub> )	PDM Range (mg/m <sup>3</sup> )	Comments

**PERSONAL AIR MONITORING SUMMARY:**

Work Description	Contaminant(s) of Concern	Sampling Media	Flow / Duration	Personnel Work Title	Comments

**SUBCONTRACTORS ON SITE:**

Company Name	Task or Function	Return to Site Next Week (Y/N)

\_\_\_\_\_   
 Health and Safety Officer - Signature

\_\_\_\_\_   
 Date

# Monthly Health and Safety Report

PROJECT: \_\_\_\_\_ MONTH: \_\_\_\_\_

## I. Descriptive Summary of Accidents/Incidents

## II. Summary of Site Safety Inspections and Audits

## III. Other Issues

1. Recognition and awards program:
2. Site specific training:
3. OSHA/third party inspections:
4. H&S program administration/implementation:
5. Subcontractor H&S performance:
6. Unique exposure hazards:
7. Site specific loss control programs:
8. Site management concerns:

# Monthly Statistical Report

PROJECT: _____ MONTH: _____ PROJECT START DATE: <u>  </u> / <u>  </u> / <u>  </u>	FWENC MANUAL			FWENC NON-MANUAL			SUBCONTRACTOR TOTALS			PROJECT TOTALS		
	Month	YTD	PTD	Month	YTD	PTD	Month	YTD	PTD	Month	YTD	PTD
	1. First Aid Cases											
2. Total OSHA Recordables												
3. Restricted Duty Cases												
4. Restricted Duty Workdays												
5. Lost Time Cases												
6. Lost Time Workdays												
7. Hours Worked - Estimated												
8. Property Losses > \$500												
9. High Loss Potential Incidents												
10. Total Incidents Investigated												

Project Incident Rates	YTD	PTD	Nat'l Avg.
Total OSHA Recordable Rate			10.6
Lost Workday Rate			4.9
Lost Workday Severity Rate			39

$$\text{OSHA Recordable Rate} = \frac{\# \text{ Recordables} \times 200,000}{\# \text{ of hours worked}}$$

$$\text{Lost Work Day Rate} = \frac{\text{Total \# of lost time cases and restricted duty cases} \times 200,000}{\# \text{ of hours worked}}$$

$$\text{Lost Work Day Severity Rate} = \frac{\text{Total \# of days lost and days restricted} \times 200,000}{\# \text{ of hours worked}}$$