

**WORK PLAN
AND
TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN
FOR
INTERIM MEASURES CLEANUP
AT
SOLID WASTE MANAGEMENT UNIT #03/10
AMMUNITION BURNING GROUND,
GROUNDWATER REMEDIATION**

**NSWC CRANE
Crane, Indiana**

**Contract No. N62467-93-D-1106
Delivery Order 0009
Statement of Work 007**

**Revision A
April 21, 1995**

Prepared for:

**Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive, P. O. Box 190010
North Charleston, South Carolina 29419-9010**

Prepared by:

**MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square 1, Suite 211
North Charleston, South Carolina 29406**

DELIVERY ORDER 0009
STATEMENT OF WORK 007
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

WORK PLAN
SWMU #03/10 AMMUNITION BURNING GROUND
GROUNDWATER REMEDIATION

Revision A, Dated April 21, 1995

Prepared by:

MORRISON KNUDSEN CORPORATION
2420 Mall Drive
Corporate Square I, Suite 211
N. Charleston, South Carolina 29406

Prepared for:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DRIVE
P. O. Box 190010
N. Charleston, South Carolina 29419-9010

SET ID NO:

2

WORK PLAN
FOR
INTERIM MEASURES CLEANUP
AT
SOLID WASTE MANAGEMENT UNIT #03/10
AMMUNITION BURNING GROUND,
GROUNDWATER REMEDIATION

NSWC CRANE
Crane, Indiana

CONTRACT #N62467-93-D-1106
DELIVERY ORDER #0009
STATEMENT OF WORK #0007

April 21, 1995
Revision A

Prepared for:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
2155 EAGLE DRIVE
P. O. BOX 190010
NORTH CHARLESTON, SOUTH CAROLINA 29419-9010

Prepared by:

MORRISON KNUDSEN CORPORATION
2420 MALL DRIVE
CORPORATE SQUARE 1 - SUITE 211
NORTH CHARLESTON, SOUTH CAROLINA 29406

**NAVAL SURFACE WARFARE CENTER
CRANE WORK PLAN**

**SOLID WASTE MANAGEMENT UNIT #03/10
AMMUNITION BURNING GROUND,
GROUNDWATER REMEDIATION**

**NSWC CRANE
CRANE, INDIANA**

**April 21, 1995
Revision A**

**CONTRACT N62467-93-D-1106
DELIVERY ORDER #0009
STATEMENT OF WORK #0007**

Prepared by:

**MORRISON KNUDSEN CORPORATION
2420 MALL DRIVE
CORPORATE SQUARE 1 - SUITE 211
NORTH CHARLESTON, SOUTH CAROLINA 92406**

APPROVALS:

MK Safety and Health Program Manager

Date

MK Quality Program Manager

Date

MK Sr. Project Manager

Date

MK Program Manager

Date

ACCEPTANCE

U.S. Navy Responsible Authority

Date

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION	1
1.1 OBJECTIVES	4
2.0 ENVIRONMENTAL COMPLIANCE	5
2.1 REGULATORY COMPLIANCE	5
2.2 PERMITS, APPROVALS, AND NOTIFICATIONS	7
2.2.1 Construction Permits	7
2.2.2 Notifications	7
3.0 PROJECT ORGANIZATION	9
4.0 PROJECT EXECUTION	13
4.1 WORK SCOPE	13
4.2 SITE ASSESSMENT	13
4.3 MOBILIZATION	13
4.4 GROUNDWATER TREATMENT OBJECTIVE	15
4.5 COLLECTION SYSTEM DESCRIPTION	16
4.5.1 Trench Excavation	16
4.5.2 Soil Sampling and Analysis	16
4.6 TREATMENT SYSTEM DESCRIPTION	18
4.7 SYSTEM OPERATION	20
5.0 QUALITY CONTROL	21
6.0 SAFETY AND HEALTH	22
7.0 DECONTAMINATION ACTIVITIES	23
7.1 MINIMIZATION OF CONTAMINATION	23
7.2 DECONTAMINATION FACILITIES	23
7.3 PERSONNEL DECONTAMINATION	24
7.4 DECONTAMINATION OF HEAVY EQUIPMENT	24
7.5 DECONTAMINATION OF SAMPLING EQUIPMENT	25
8.0 WASTE MANAGEMENT	26
9.0 ENVIRONMENTAL PROTECTION	27
10.0 SCHEDULE	28
11.0 REFERENCES	30

TABLES

TABLE	PAGE
3-1 Project Responsibilities	11
4-1 ABG Groundwater Treatment Loadings and Treatment Requirements	15

FIGURES

FIGURE	PAGE
1-1 Vicinity Map of NSWC Crane, Indiana	2
1-2 Location of Solid Waste Management Units	3
3-1 Organization Chart	10
4-1 SWMU #03/10 Ammunition Burning Ground Location Map	14
4-2 SWMU #03/10 ABG Groundwater Extraction Wells and Treatment Facility Layout Plan	17
4-3 Process Flow Diagram of the ABG Groundwater Treatment System	19
10-1 SWMU #03 Dewatering Work Plan Schedule	29

APPENDICES

APPENDIX	PAGE
A INSPECTION ITEMS	A-1

1.0 INTRODUCTION

The Naval Surface Warfare Center (NSWC) Crane is located in southwestern Indiana, as shown in Figure 1-1, and provides support for equipment, shipboard weapons systems, and ordnance. In addition, NSWC supports the Crane Army Ammunition Activity (CAAA) including production and renovation of conventional ammunition, storage, shipment, and demilitarization and disposal of conventional ammunition.

This Work Plan has been prepared by Morrison Knudsen (MK) for the Naval Facilities Engineering Command (NAVFACENGCOM), Southern Division pursuant to the scope of work defined in Delivery Order #0009, under Contract #N62467-93-D-1106. This Work Plan describes the methods to be used to perform interim measures cleanup activities required at Solid Waste Management Unit (SWMU) #03/10 Ammunition Burning Ground (ABG) for Groundwater Remediation.

The ABG area is located in the eastern portion of the NSWC Crane, just west of the Dye Burial Ground (DBG), as shown in Figure 1-2, and occupies approximately 50 acres. Access to the site is by way of Highway 462. The ABG has been used extensively since the 1940s to destroy materials contaminated with explosives, bare explosives, rocket motors, candles, flares, solvents, red phosphorus, small detonators, and fuse materials. The largest quantities were destroyed between 1956 and 1960, when 15,000 pounds per day of smokeless powder and 48,000 pounds per day of high explosives were burned on the soil surface. The area is also used for flashing the residue from bombs and projectiles after melt-out or drill-out operations have removed the bulk of the explosives. Ammunition burning is a continuing operation and is now performed in clay-lined steel pans (ACOE 1992). Close coordination between NSWC Crane operations personnel and remediation personnel is required to minimize impacts on present operations.

Fifty-two sampling wells in the ABG area revealed the presence of chemical compounds in the various aquifers. Contaminants include the explosives RDX, HMX, and TNT, the volatile organic tetrachloroethane (TCE), and barium (Murphy 1992). A groundwater treatment system will be required to remediate the contaminated aquifers.

Soil samples indicated contaminants of explosives, heavy metals, volatile organics, pesticides, and herbicides. The most significant contaminants (in terms of concentration) are explosive compounds including 2,4-DNT; 2,6-DNT; TNT; Tetryl; DNB; RDX; and HMX. Antimony, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, aluminum, cobalt, magnesium, manganese, volatile organics, pesticides, and herbicides are also present, but at concentrations levels which are orders-of-magnitude lower than the explosives concentrations. In most cases the non-explosive contaminants are found in samples that also contain explosive contaminants (ACOE 1992).

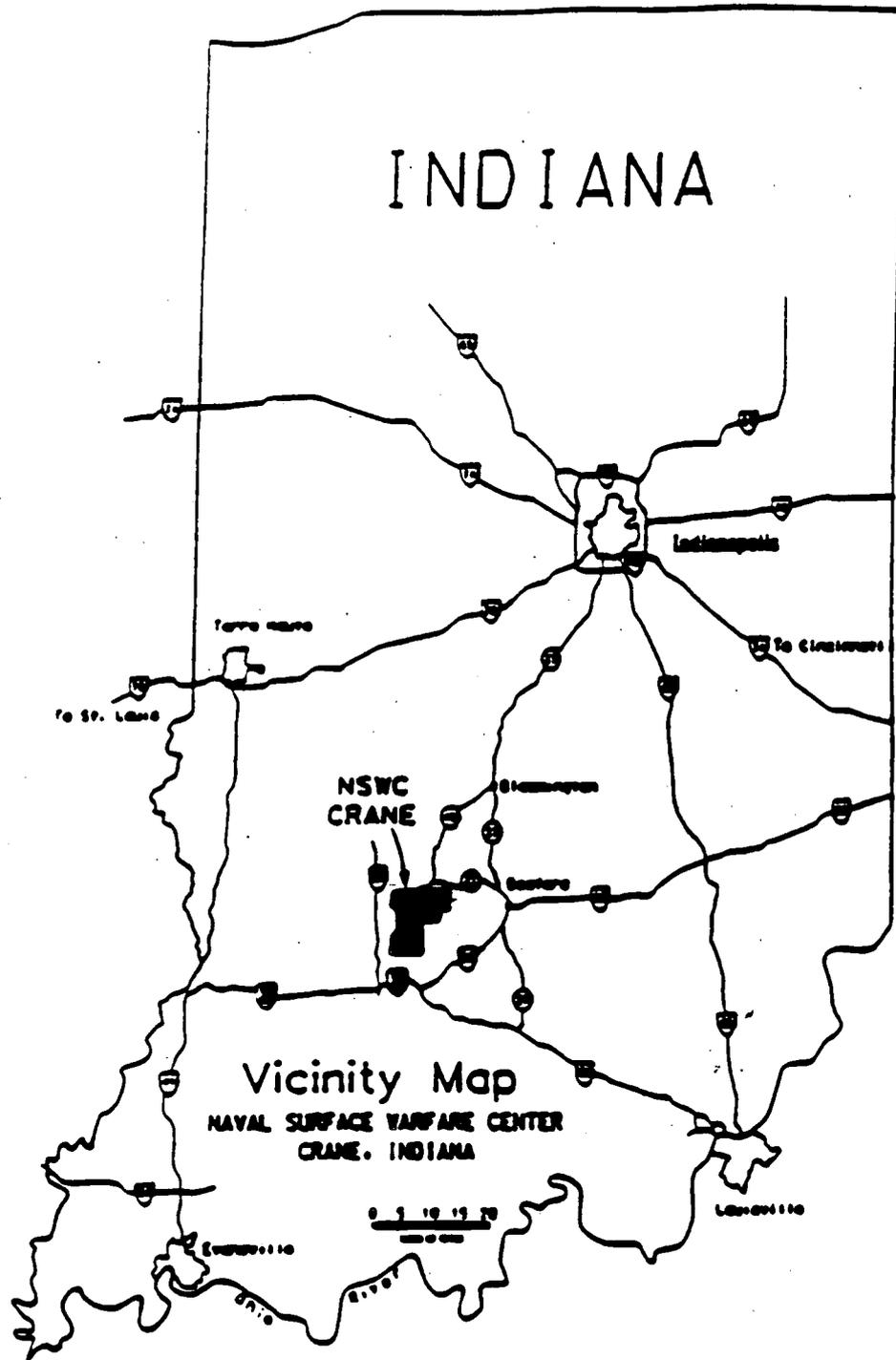
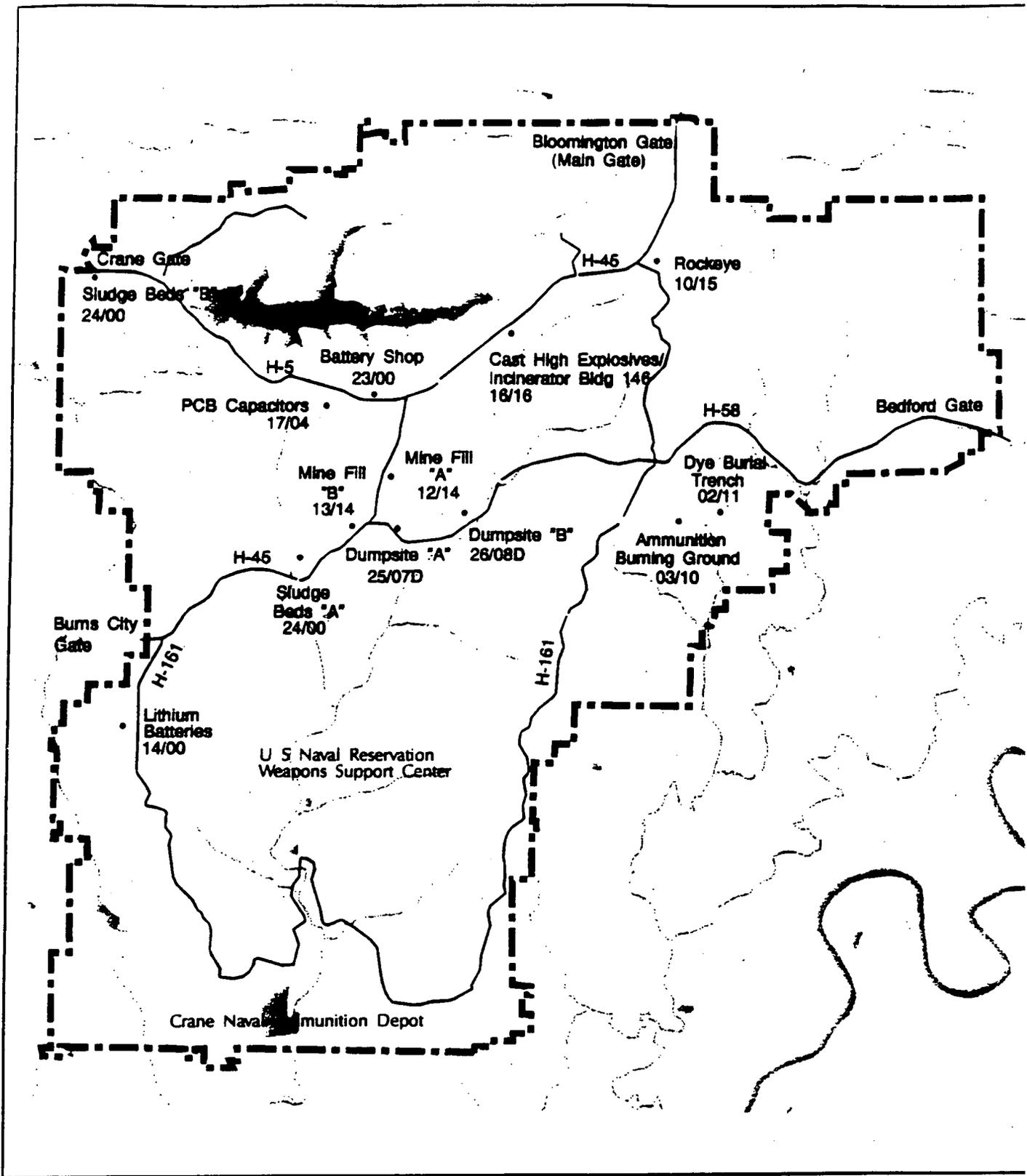


Figure 1-1
Vicinity Map of NSWC Crane, Indiana



- 02/11 Dye Burial Ground
- 03/10 Ammunition Burning Ground Area
- 10/15 Rockeye
- 12/14 Mine Fill A
- 13/14 Mine Fill B
- 14/00 Sanitary Landfill and Lithium Battery
- 16/16 Cast High Explosives Fill/Incineration complex
- 17/04 PCB Capacitor Burial/Pole Yard
- 23/00 Battery Shop
- 24/00 Sludge Drying Bed A
- 24/00 Sludge Drying Bed B
- 25/07D Highway 58 Dump Site A
- 26/08D Highway 58 Dump Site B

Figure 1-2
Location of Solid Waste
Management Units

0.25 0.5 1 1.5 2 2.5 MILE

1.1 OBJECTIVES

MK's goal is to cost-effectively and efficiently execute the work in accordance with the Delivery Order requirements, while meeting or exceeding all site-specific, local, state, and federal requirements. The primary work objectives are to:

- Perform all work in a manner that maximizes worker safety and minimizes environmental impacts.
- Trench excavation and installation of groundwater collection piping header from government-installed extraction wells and pumps.
- Furnish and install a groundwater treatment system at the ABG.
- Restore the excavated areas to original grade with clean fill from a borrow source.
- Start-up, operate, and maintain the groundwater treatment system for one year.

2.0 ENVIRONMENTAL COMPLIANCE

Promulgation of the Environmental Protection Agency's (EPA's) regulatory program under the Resource Conservation and Recovery Act (RCRA) provided the impetus to identify and control environmental contamination from past practices at NSWC Crane. On December 23, 1989 the EPA issued the federal portion of the final RCRA permit for NSWC Crane to the U.S. Navy. This permit established the Hazardous and Solid Waste Amendment (HSWA) Corrective Action Requirements and Compliance Schedules obligating the U.S. Navy to perform Remedial Field Investigations (RFIs) at 30 SWMUs, to conduct Corrective Measures Studies, and to implement corrective measures if needed.

2.1 REGULATORY COMPLIANCE

The following regulations, guidance, and procedures may affect the work at SWMU #03/10 ABG Groundwater Remediation.

- U.S. Navy or NSWC Crane guidance
- U.S. Occupational Safety and Health Administration
29 CFR 1910, Occupational Safety and Health Standards
29 CFR 1926, Safety and Health Regulations for Construction
- U.S. Army Corps of Engineers
EM-385-1-1, Safety and Health Manual
- U.S. Environmental Protection Agency
40 CFR 261, Identification and Listing of Hazardous Waste. Compliance will be required to characterize the waste.

40 CFR 262, Regulations for Hazardous Waste Generators. Compliance may be required with Subpart C for accumulation, packaging, labeling, marking, and placarding requirements and with Subpart B for manifest requirements.

40 CFR 264, Regulations for Owners and Operators of Permitted Hazardous Waste Facilities. Compliance with the following Subparts may be required:

Subpart I, Use and Management of Containers. Compliance with this subpart may be required for management of all hazardous waste containers.

Subpart S, Corrective Action Management Units. Compliance with these rules may be required depending on EPA designation.

- **Indiana Department of Environmental Management**
 - 329 IAC 3.1-6, Identification and Listing of Hazardous Waste. This regulation incorporates by reference the federal regulations with a few additions.

 - 329 IAC 3.1-7, Standards Applicable to Generators of Hazardous Waste. This regulation incorporates by reference the federal regulations with a few changes and additions.

 - 329 IAC 3.1-9, Final Permit Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. This regulation incorporates by reference the federal regulations with a few changes and additions.

- **Indiana Water Pollution Control Board**
 - 327 IAC 5, Industrial Wastewater Pretreatment Programs (NPDES). The wastewater discharge from the groundwater treatment system will require an NPDES permit, or a modification to the existing NPDES permit (327 IAC 5-2-16).

- **U. S. Department of Transportation**
 - 49 CFR 172, Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements. This part describes requirements for completing shipping papers; marking, labeling, and placarding; training; and emergency response.

 - 49 CFR 173, General Requirements for Shipments and Packaging. This part describes classification and packaging of hazardous materials.

All waste products from the activities in this Work Plan will be disposed of as described in the Waste Management Plan (WMP) in compliance with federal and state hazardous waste regulations. The state regulations incorporate the federal regulations with few exceptions; however, particular attention should be paid to the state manifesting requirements.

Off-site transportation of any hazardous waste or material requires compliance with the DOT hazardous material transportation rules. The particular requirements are listed in the WMP. The Site Shipping Officer (SSO) will coordinate the shipping effort. MK will not sign any manifests.

All excavations must comply with the NSWC Crane site requirements. MK subcontractors will notify MK, and MK will in turn notify the NSWC Crane Site Representative of all construction activities, as outlined in Section 2.2 below.

2.2 PERMITS, APPROVALS, AND NOTIFICATIONS

Several permits, approvals, and notifications will be required for implementing the Work Plan interim measures cleanup activities and are summarized in the following sections.

2.2.1 Construction Permits

The NSWC Crane facility requires issuance of construction permits before construction initiation. An Excavation and Trenching Permit will be required for each area and shall include a statement of clearance for safe access based on the removal or absence of unexploded ordnance in the work zone. The MK Project Manager (PM) will be responsible for obtaining this permit through the Public Works Department, Building 2516. Preparation of the application and associated drawings should be started as soon as possible to allow time for review and approval.

2.2.2 Notifications

All federal, state, and local agency notifications will be performed by the NSWC Crane Site Representative. All MK subcontractors will notify the PM, and the PM will in turn notify the NSWC Crane Environmental Protection Department of all interim measures cleanup activities. These notifications include, but are not limited to:

- Clearing and grubbing.
- Trenching and excavation.
- Backfilling and compaction.
- Storage and handling of hazardous materials.
- Inspection, manifesting, and shipping of hazardous materials.
- Construction activities.

If a Corrective Action Management Unit (CAMU) is designated, the PM will ask the NSWC Crane Environmental Protection Department to request permission from the EPA to temporarily stockpile soils as described in this Work Plan. If permission is denied, the soils must be sampled before they are excavated.

During interim measures cleanup activities, as described in this Work Plan, emergency notifications will be required in case of fire, explosion, or spills. Notifications shall be made according to the Emergency Response Plan as described in the Task-Specific Site Safety and Health Plan (SSHP) for this Work Plan.

The interim measures at NSWC Crane include treatment of contaminated groundwater at the Ammunition Burning Ground. The groundwater will be pumped to the surface,

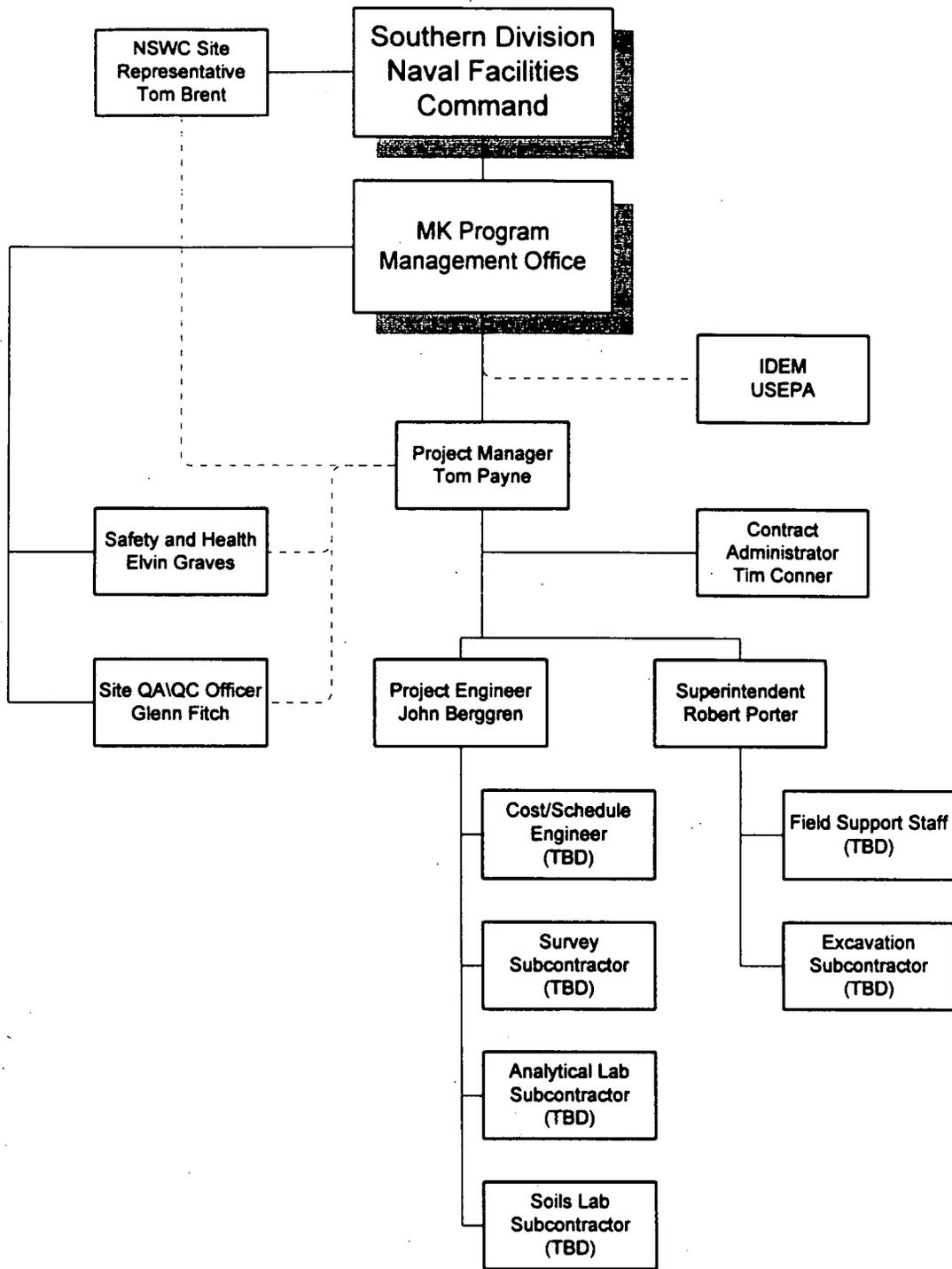
treated by carbon absorption and chemical precipitation, and discharged via a surface runoff water ditch. Discharge to the surface runoff water ditch may be accomplished by securing a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to the Clean Water Act.

NSWC Crane currently discharges treated waste water under an NPDES permit issued by IDEM which regulates discharge to surface water from twelve separate outfalls. The existing NPDES permit may be modified under 327 IAC 5-2-16 to add the outfall from the groundwater treatment system, or a new permit may be submitted for application. This modification or application must be approved by IDEM prior to system start-up.

3.0 PROJECT ORGANIZATION

The project team organization for this Delivery Order is shown in Figure 3-1. The responsibilities of each team member are listed in Table 3-1.

The team is structured to provide the maximum flexibility and efficiency in the execution of this Delivery Order. This flexibility and efficiency will facilitate changes that may occur in the related scope of work.



**Figure 3-1
Organization Chart**

**Table 3-1
Project Responsibilities**

TEAM MEMBERS	RESPONSIBILITIES
NAVFACENGCOM Southern Division	Overview of project execution and coordination between Contractor, NSWC Crane, and other agencies.
Program Management Office (PMO)	Overall responsibility for all cleanup measures at all sites in the Southern Division of the Naval Facilities Engineering Command under Contract No. N62467-93-D-1106. The PMO is the point of contact for NAVFACENGCOM.
NSWC Site Representative	NAVFAC's on-site representative and is the liaison between NSWC officials and the Project Manager for the SWMUs at NSWC Crane.
Project Manager (PM)	<p>Overall responsibility for implementing this Work Plan and all other project activities. The PM will control all on-site forces to ensure completion of project tasks.</p> <ul style="list-style-type: none"> • Single point of contact for NAVFACENGCOM liaison. • Coordinates the project resources to ensure compliance with the appropriate plans, procedures, and regulatory requirements, • Oversees all personnel on-site and coordinates with the Program Management Office (PMO).
Project Engineer (PE)	<p>Reports to the PM and will act as the Assistant Project Manager. Specific responsibilities include:</p> <ul style="list-style-type: none"> • Supervises the activities of the project field staff (regulatory specialists, geologists, field engineers, etc.). • Coordinates with the Site Superintendent to ensure that activities are properly coordinated between subcontractors. • Coordinates the activities of the support staff and provides project status reports to the PM. • Maintains project records and prepares technical scopes of work for subcontractors. • Directs the efforts of technical subcontractors (i.e., surveying, sampling and testing).
Cost and Schedule Engineer	<p>Reports to the PE and has primary responsibility for the maintenance of the cost and schedule control systems, including regular assessments of performance.</p> <ul style="list-style-type: none"> • Provides administrative support services. • Evaluates cost and schedule information and provides status reports. • Prepares monthly progress reports. • Reviews cost/schedule submissions by subcontractors. • Verifies progress against payment requests. • Maintains the document control system. • Maintains contract change notice log and trend logs.
Contract Administrator	<p>Provides administrative support to the technical staff for contractual and procurement activities.</p> <ul style="list-style-type: none"> • Prepares subcontract bid packages. • Issues and provides support in the administration of subcontracts. • Monitors SB/SDB compliance. • Monitors purchase orders.

**Table 3-1
Project Responsibilities**

TEAM MEMBERS	RESPONSIBILITIES
<p>Site Safety and Health Officer (SSHO)</p>	<p>Reports to the PMO. Implements and ensures compliance with the Task-Specific Site Safety and Health Plan (SSHP). Tracks and reports on safety-related matters.</p> <ul style="list-style-type: none"> • Responsible for the control and elimination of existing and potential industrial hazards. • Implements and executes personnel monitoring program to ensure proper monitoring of internal and external exposures. • Provides site-specific training to personnel as required by the SSHP. • Tracks all personnel training requirements, survey data, certifications, and records to ensure compliance with plans and regulations. • Assists in developing and implementing the SSHP. • Reviews and approves subcontractor Safety and Health Plans and Programs. Conducts audits as appropriate to ensure compliance. • Reviews and approves work permits for appropriate industrial hygiene and safety controls. • Provides monitoring to ensure the protection of project personnel, the public, and the environment, • Maintains an inventory of industrial hygiene and safety supplies as appropriate. • Maintains monitoring equipment and calibration records. • Stops work when necessary to ensure the safety of personnel and to prevent damage to the environment.
<p>Site Superintendent</p>	<p>Reports to the PM and has primary responsibility for the coordination and control of all field activities to ensure that all tasks included in this Work Plan are completed.</p> <ul style="list-style-type: none"> • Coordinates the activities of all subcontractors. Directs all subcontractors together with the PE. • Provides daily reports to the PM and PE on the status of field activities.
<p>Site Quality Control Officer (SQCO)</p>	<p>Reports to the PMO and has primary responsibility for verifying a consistently high level of quality for the project.</p> <ul style="list-style-type: none"> • Reviews and checks all documents, reports, and testing results. • Coordinates with procurement, engineering, and cost/schedule departments. • Observes all field activities to ensure compliance with this Work Plan and the QAPP and completes Field Inspection Checklists (Appendix A). • Keeps minutes of the periodic quality meetings. • Implements the three phases of quality control: Preparatory, Initial, and Follow-up inspections. • Ensures tracking and resolution of nonconformance/rework items.
<p>Note: See Section 3 of the Task-Specific Site Safety and Health Plan for names and contact.</p>	

4.0 PROJECT EXECUTION

This section details the work for the SWMU covered by this Work Plan. Unexploded Ordnance (UXO) clearances, excavation permits, hot work permits, and other required approvals will be obtained before performance of any field work beyond visual survey and walk arounds. All activities will also be coordinated with operations activities near the work areas. These clearances, permits, and approvals will be obtained from the NSWC Site Representative.

4.1 WORK SCOPE

The scope of work includes:

- Submission of a new permit or a modification to the existing NSWC National Pollutant Discharge Elimination System (NPDES) permit to allow discharge of treated water to a nearby surface water runoff ditch.
- Trench excavation and groundwater collection piping header installation to route water from four government-installed extraction wells and pumps as shown in Figure 4-1.
- Furnish and install an 80-gpm groundwater treatment system.
- Start-up, operate, and maintain a groundwater treatment system for one year.

4.2 SITE ASSESSMENT

The NSWC Crane Site Representative will determine if a UXO survey is necessary. If the potential exists for encountering unexploded ordnance in the work area, NSWC Crane will perform a surface UXO survey to identify and remove any unexploded ordnance. The area will be surveyed and located in relationship to existing monuments. Data will be collected to create a topographical map of the site documenting the location of the groundwater treatment system and the buried pipe. The condition of the four extraction wells and pumps, including pumping rate and development data, will be collected and documented.

4.3 MOBILIZATION

The initial steps in mobilization will be to prepare the Environmental Condition Report and for the subcontractor to define the configuration of the work area including the boundaries of the Exclusion Zone (EZ), the Contamination Reduction Zone (CRZ) with

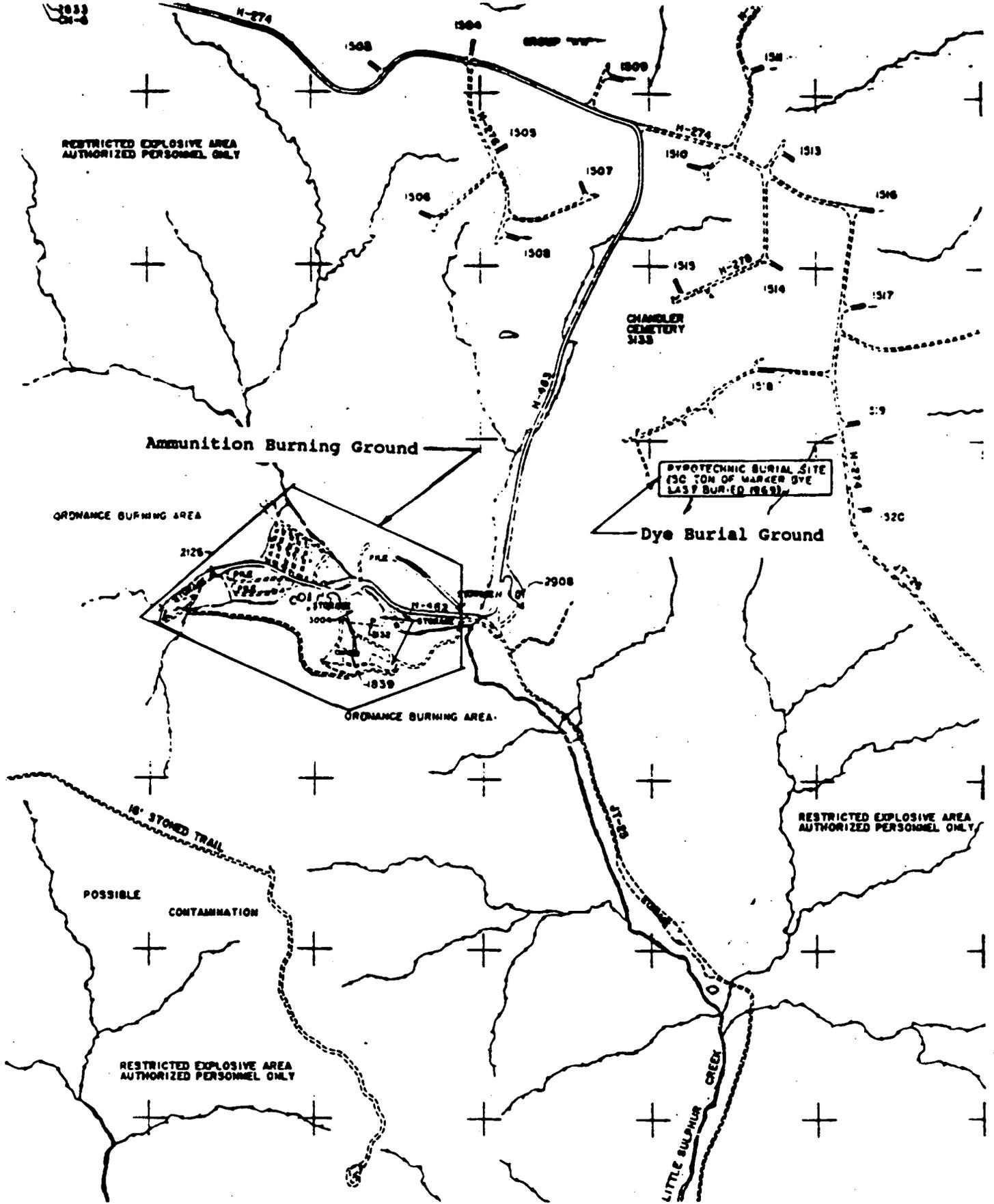


Figure 4-1
SWMU #03/10 Ammunition Burning Ground Location Map

appropriate decontamination stations, the Support Zone (SZ), and access routes. The work zones and access routes will be established. Tools, equipment, and supplies will be delivered to the site and personnel mobilized.

The subcontractor will steam clean and inspect all equipment before shipment to the site. The contractor will inspect the equipment for the presence of dirt, oils, and grease. The general condition of the equipment will be inspected and tested to ensure that all safety systems and alarms are functional. The performance of the equipment will be tested to determine if the equipment can perform the required tasks.

Storm water and erosion control measures will be implemented as necessary to control storm water runoff and to prevent erosion. These measures are explained further in the Environmental Protection Plan.

4.4 GROUNDWATER TREATMENT OBJECTIVE

The extracted groundwater will be treated to remove heavy metals, organic contaminants and suspended solids. The treatment system will be sized for 80 gpm (nominal) of extracted water (MK 1994). The current level of contamination in the groundwater (Murphy 1992) and the cleanup levels are listed in Table 4-1. These cleanup levels may be modified, based on final issuance or modification of the NPDES permit from the Indiana Department of Environmental Management (IDEM).

Contaminant	Design Influent Concentrations (mg/l)	Design Effluent Concentration (mg/l)
TTO ¹	20.0	2.13
Nitrated Hydrocarbons ²	2.0	2.0
Nitrate	16.5	90.0
Barium	0.4	1.4
Lead	Trace	0.006
Cadmium	0.1	0.002
Mercury	0.014	0.0001

¹ Total Toxic Organics include TNT, HMX, RDX, and TCE.
² Nitrated Hydrocarbons include TNT, HMX, and RDX. The effluent limitation applies to the summation of the measured effluent values of each of these compounds.

4.5 COLLECTION SYSTEM DESCRIPTION

The four extraction wells will be connected to a common header which will convey the water to the treatment facility. Figure 4-2 depicts the well locations, the groundwater collection piping, and treatment system. Effluent from the treatment facility will be discharged to a nearby ditch. The area between the four extraction wells and the groundwater treatment facility is located within the ABG SWMU that will be remediated for explosives-contaminated soil under a separate work plan.

4.5.1 Trench Excavation

In order to install a collection system which would remain undisturbed when the interim measures cleanup for explosives-contaminated soil is begun, trenches 8-feet wide by 3-foot deep will be excavated per the collection piping design layout drawings and specifications. Installing the collection piping and backfilling with clean soil from a borrow source will allow future soil excavation to be performed without encroaching on the trench and buried pipe areas, thereby maintaining groundwater treatment system operation.

Backfill will be placed in 12-inch lifts and compacted, based on Modified Proctor measurements, to a density of 85 percent in isolated areas, 90 percent for areas adjacent to roads and structures, and 95 percent under roads and structures. All areas will be covered with 3 inches of topsoil (defined as having a minimum of five percent organic matter), seeded with native grasses, and fertilized. Erosion control measures will be maintained until the growth of grasses is sufficient to prevent erosion. All roads, ditches, culverts and walkways will be restored.

The potentially contaminated soil excavated from the trench will be containerized in roll-offs prior to transport to the bioremediation facility.

The extraction well pumps will be connected to the header via an underground line. The header will be an underground line. All underground piping will be buried to a depth of at least 3 feet and pitched to drain towards the extraction wells. All piping will be pressure-tested (witnessed by the Project Manager or his designee) after installation and prior to backfilling.

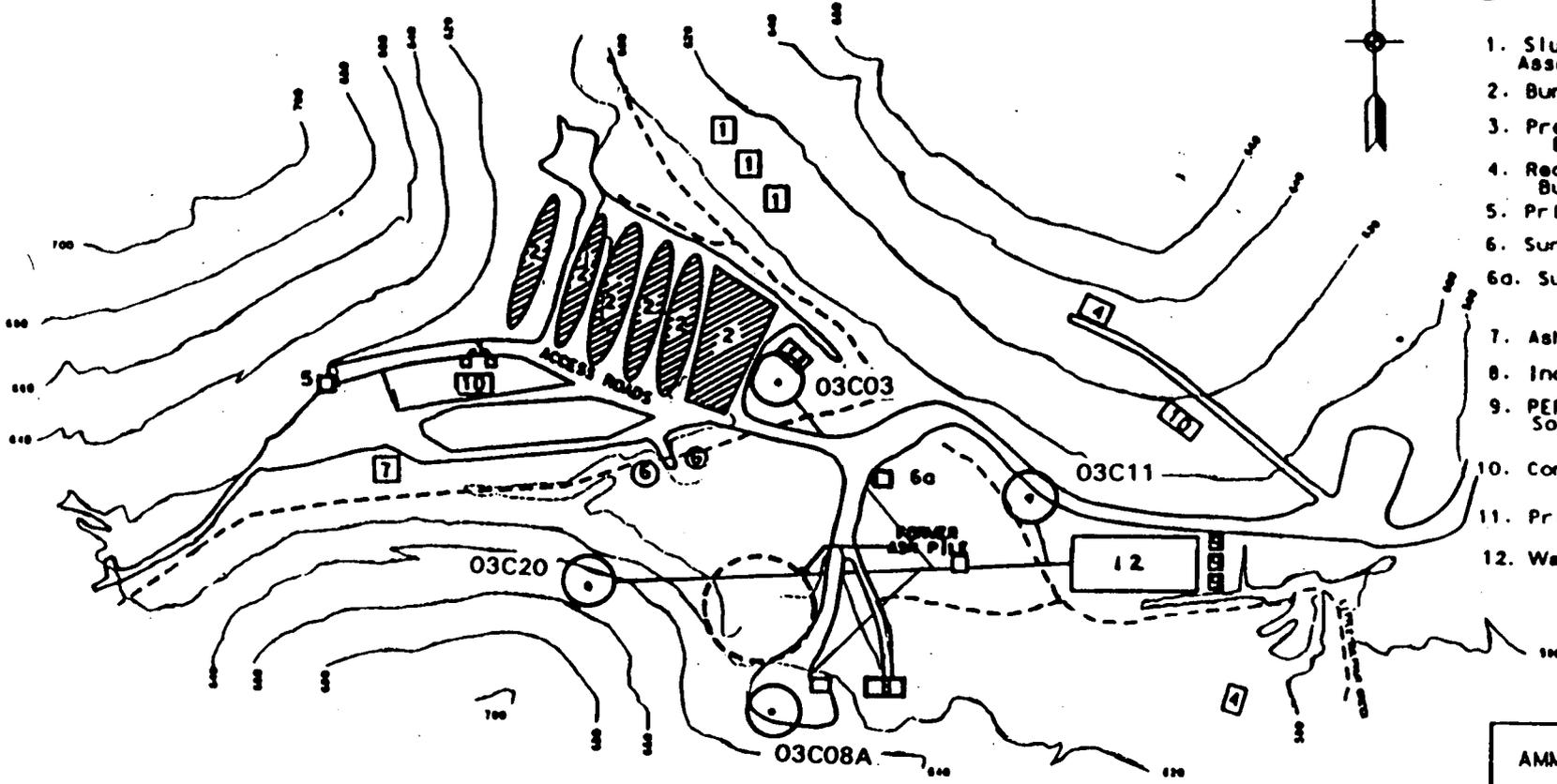
4.5.2 Soil Sampling and Analysis

Soil samples will be collected and screened for concentrations of explosives which exceed those levels specified in Table 6 of the Sampling and Analysis Plan (SAP). Two soil samples will be obtained from the bottom of the trench at 6 inches depth at 100-foot intervals along the trench excavation. Should concentrations of explosives exceed

LEGEND

○ Recovery Well Locations

1. Sludge Burn Pads & Associated Tanks
2. Burn Pads
3. Production Scrap Burn Pads
4. Red Phosphorous Burn Pads
5. Primer Pit
6. Surface Impoundments
- 6a. Surface Impoundments Tanks
7. Ash Inspection Pan
8. Incinerator Cage
9. PEP Contaminated Solvents Liquid Burn Pads
10. Contaminated Material Burn Pads
11. Primer Burn Box
12. Water Treatment Unit



NSWC CRANE
AMMUNITION BURNING
GROUND
SWMU 03/10

**Figure 4-2
SWMU #03/10 ABG Groundwater Extraction Wells
and Treatment Facility Layout Plan**

those listed in Table 6 of the SAP, additional excavation shall be required and the screening process repeated until acceptable levels are indicated. The SAP describes the sampling procedures and screening methods.

4.6 TREATMENT SYSTEM DESCRIPTION

The groundwater treatment system will be located in a weather protection enclosure. The Facility will include a curbed concrete pad sloped to a sump to control any run-on or runoff, heating, ventilation, and lighting. The system will be designed to meet or exceed the NFPA Life Safety Code 101 and NFPA Wastewater Treatment and Collection Facilities 820, where applicable.

The groundwater treatment system will include components to remove heavy metals, suspended solids, and organic compounds from the extracted water. The estimated loading requirements are provided in Table 4-1. Figure 4-3 shows a process flow diagram of the recommended treatment system.

The metals/particulate removal system will consist of chemical reaction tanks for pH adjustment, a flocculation chamber, clarifier, filter press, and polishing filter. The water will then be pumped to carbon adsorption vessels for organics removal. After removal of the organic contaminants, the water will be discharged to a surface water runoff ditch in accordance with the NSWC Crane NPDES permit.

The system will also accept contaminated water that has been collected from excavation and decontamination areas. Holding tanks will be provided for injection of these fluids into the treatment system. These tanks will also provide storage capacity for short periods of equipment shutdown as well as effluent storage for start-up discharge characterization.

The solids are pumped from the clarifier to a sludge thickener which in turn feeds the sludge to a filter press for further liquid removal. All potentially hazardous sludges will be sampled, characterized, containerized, and labeled prior to disposition at an off-site TSD facility. The sludge will be containerized in accordance with the Waste Management Plan.

The treatment system will be designed with the necessary controls, meters, and pumps to provide continuous automatic operation. The design will include necessary interlocks for a systematic shutdown should any of the components malfunction that could cause improper treatment or safety concerns.

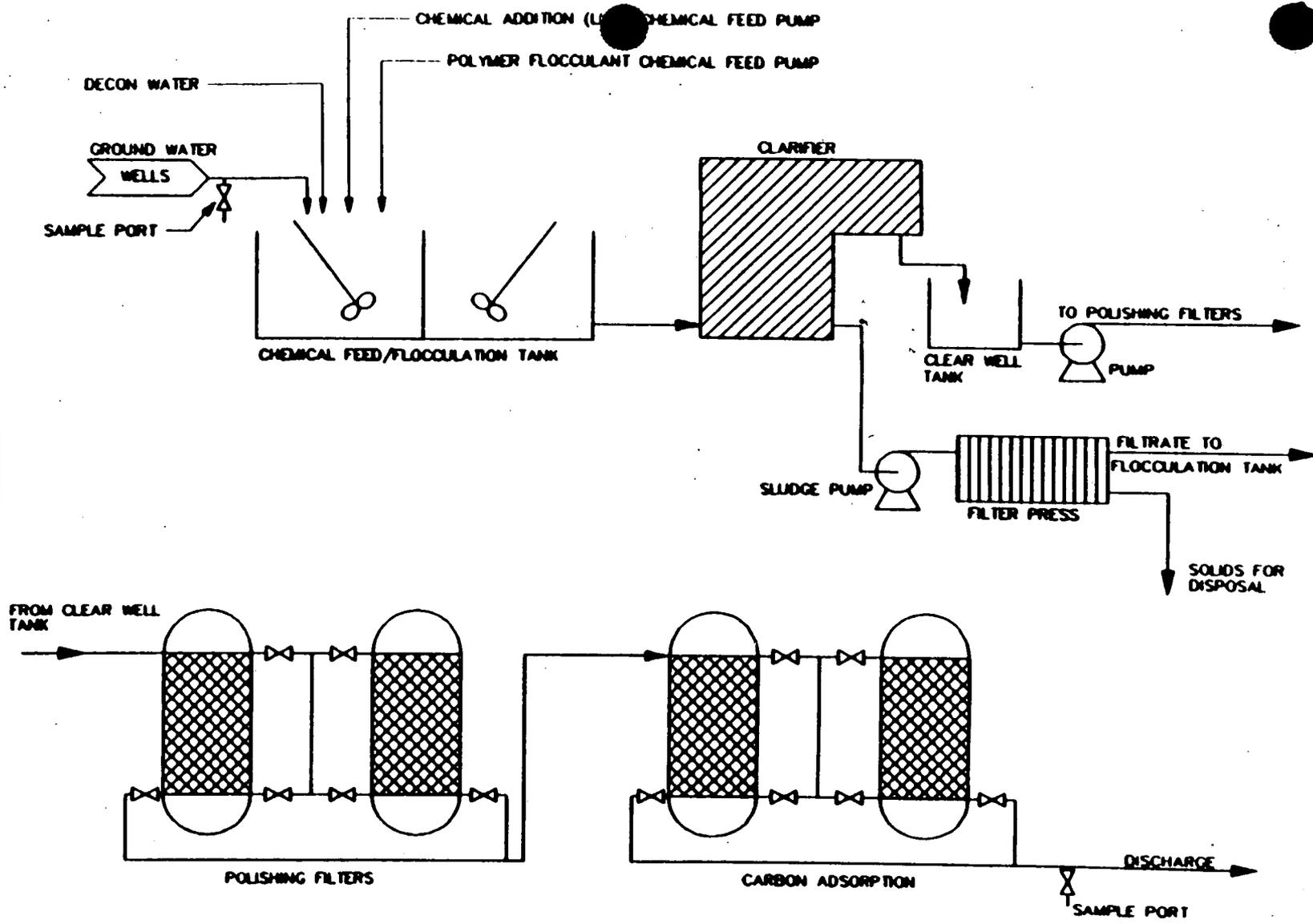


Figure 4-3

Process Flow Diagram of the ABG Groundwater Treatment System

4.7 SYSTEM OPERATION

The system will operate 24 hours a day, 7 days a week, for one calendar year. The effluent will be periodically tested to ensure that the effluent meets discharge limits as defined in the NPDES permit. Sampling procedures are described in the SAP. A formal start-up and acceptance test plan will be prepared, approved, and implemented for this facility. System level operation and maintenance manuals will also be provided.

5.0 QUALITY CONTROL

As prime contractor, MK will implement and retain full authority of the Quality Control Plan (QCP) for this project. The QCP is bound under separate cover and is to be used in conjunction with this Work Plan. MK will manage all matters involving Quality Control performed in the execution of NAVFAC Delivery Orders. This approach provides the Navy with a quality management system having clear lines of authority and responsibility, and a consistent approach and application of quality requirements.

The QCP identifies quality testing and inspection requirements for the scope of work to be performed. To supplement the information contained therein, Appendix A of this Work Plan provides Field Inspection Checklists for general and specific items when performing inspections.

6.0 SAFETY AND HEALTH

The Task-Specific Site Safety and Health Plan (SSHP) for this Work Plan is specific to interim measures cleanup activities for SWMUs #03/10, #10/15, #12/14, #13/14, and Soils Bioremediation Facility. The SSHP is a supplement to this Work Plan. All details in the SSHP are to be strictly followed during the execution of the work.

7.0 DECONTAMINATION ACTIVITIES

7.1 MINIMIZATION OF CONTAMINATION

During site activities, all personnel shall minimize contact with contaminated materials to keep "clean" during site activities. All personnel should minimize kneeling, splashing, and inadvertent physical contact with contaminated materials. Field procedures will be developed to control overspray and runoff and to ensure that unprotected personnel working nearby are not affected.

Entrance to the exclusion zones will be limited to personnel trained in accordance with 29 CFR Part 1910.120. The level of protection worn within each exclusion zone will be specified by the Site Safety and Health Officer (SSHO). Selection of personal protective equipment and anticipated levels of protection are summarized in Tables 5 and 6 of the SSHP. All personnel leaving the exclusion zone will pass through a decontamination zone and follow personnel decontamination procedures as specified in the SSHP.

7.2 DECONTAMINATION FACILITIES

Because of the distances between the different work areas, each SWMU shall have a designated decontamination facility. Before construction of each decontamination facility, soil samples shall be taken at the proposed location of the decontamination pad to establish the environmental conditions before interim measures cleanup activities begin.

Temporary personnel decontamination and shower/changeroom trailers will be provided in those areas designated by the SSHO. Each equipment decontamination facility shall be constructed of a 60-mil high-density polyethylene (HDPE) liner draped over sandbags and sloped to a sump or equal containment system. The liner will be visually inspected before use on a daily basis to detect possible failures of the liner material. The inspection process will consist of checking for the following:

- Evidence of tears and holes.
- Evidence of seepage.
- The sheeting is adequately fastened to the side walls.
- The liner adequately covers the sandbags at the end section.

If the liner is damaged, it will be repaired or replaced before further use of the facility. Soil beneath the liner in the area of the breach will be sampled.

Records will be maintained specifying facility construction material and methods, disposition of liquids and solids, daily inspections, and any repairs and/or breaches of liner integrity.

All decontamination fluids collected in the sump will be containerized at the end of each shift and sampled to determine disposal requirements. If precipitation is predicted, the decontamination pad will be covered to prevent accumulation of storm water.

After interim measures cleanup of a specific SWMU is completed, the decontamination facility will be dismantled. The materials from the facility are anticipated to be reused at another SWMU. If there is no indication of seepage, tears or holes, the HDPE liner will be thoroughly cleaned before being transported to another SWMU. Any decontamination facility materials that have been dispositioned as waste and are not reusable will be characterized and properly disposed of.

After the decontamination facility has been dismantled and removed, the underlying surface will be visually inspected. Visibly contaminated material will be removed and managed as a potentially hazardous material.

7.3 PERSONNEL DECONTAMINATION

Personnel will be required to pass through a decontamination area before exiting the exclusion zone. The personnel decontamination area will be located adjacent to the exclusion zone. The area will include, as required, a protective clothing removal area and container, respirator removal area and containers, storage for clean personnel protection equipment and clothing, wash station supplies for hands and face, and emergency showers for whole-body cleaning.

Before changing into street clothes, whole-body cleaning will be mandatory for personnel exiting areas as designated in the SSHP. The whole-body shower and change trailer will be provided in a central location.

All contaminated personal protective equipment and clothing shall be properly disposed of or cleaned and inspected for reuse. Field personnel decontamination procedures will be generated for these actions and will be monitored by the SSO.

7.4 DECONTAMINATION OF HEAVY EQUIPMENT

Portions of construction and field equipment that have come into contact with any potentially contaminated material will be decontaminated. Heavy equipment, such as trucks and backhoes, will be cleaned by high-pressure water or steam. The equipment will be visually inspected for signs of contamination. If signs of contamination are still present, the cleaning procedures will be repeated until the criteria for cleanliness has been met. A detailed written field procedure will be prepared for this action.

7.5 DECONTAMINATION OF SAMPLING EQUIPMENT

Sampling equipment will be decontaminated per the manufacturer's instructions or as described in the Sampling and Analysis Plan.

8.0 WASTE MANAGEMENT

Waste management, including disposal functions, will be conducted in accordance with the project's Waste Management Plan (WMP) and all applicable regulations as specified in this Work Plan. The WMP is bound under separate cover and is to be used in conjunction with this Work Plan. However, NSWC Crane retains ownership of all wastes generated and is responsible for signing all waste manifests prepared for this project.

During field activities, various wastes will be generated including contaminated and noncontaminated soil and debris, ground and rain water, decontamination water, disposable personnel protective equipment, and inert wastes.

Initially, wastes will be placed in stockpiles and sampled for contamination. Contaminated soil will be containerized and characterized before off-site disposal. Characterization is necessary for soil excavated from the SWMUs. All contaminated soil will be containerized in 20- or 40-cubic yard roll-offs. Once a roll-off is filled, four discrete samples will be obtained from each quadrant of the roll-off. The quadrants will be determined by visual estimation in the field.

Each sample will be collected from at least 1 foot deep. The four samples collected will be composited according to weight (i.e., an equal weight from each discrete sample is combined into the composite sample). Soil samples will be collected using the procedures contained in the Sampling and Analysis Plan (SAP). The SAP is bound under separate cover and is to be used in conjunction with this Work Plan. Each composite sample will be analyzed for the parameters found in Table 1 of the SAP. Laboratory results of the characterization analysis will be used to classify the materials per the WMP.

9.0 ENVIRONMENTAL PROTECTION

During site work, MK will employ measures to ensure protection of the environment. All site work will be performed in a manner that will minimize pollution of the air, water, and land. Environmental protection activities executed at the site will follow the Environmental Protection Plan (EPP) and all applicable regulatory requirements. The EPP is bound under separate cover and is to be used in conjunction with this Work Plan. Care will be exercised to minimize the areas to be disturbed. An Environmental Condition Report (ECR) will be prepared before interim measures cleanup activities at the site. The site will be restored, to the practical extent, to the original conditions documented in the ECR.

**10.0
SCHEDULE**

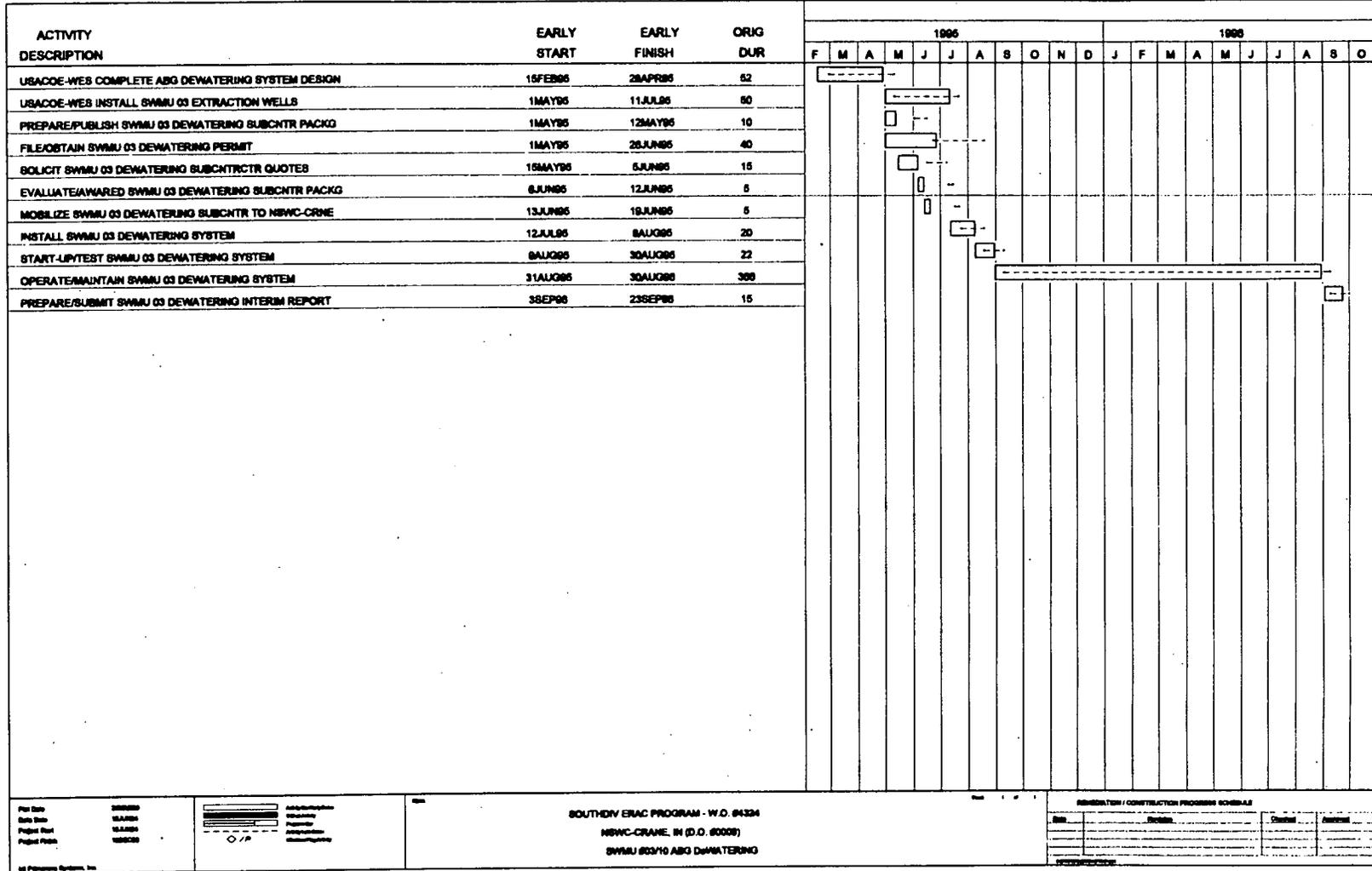


Figure 10-1
 SWMU #03 Dewatering Work Plan Schedule

11.0 REFERENCES

Morrison Knudsen Corporation, 1994. *Site Meeting Minutes of August 16-17, 1994*. R. Centinaro. August.

Murphy, W.L., 1992. *Draft RCRA Facility Investigation Phase III Groundwater Release Characterization Report; SWMU #03/10 Ammunition Burning Ground*. W.L. Murphy, Department of the Army, Waterways Experimental Station. August.

U.S. Army Corps of Engineers (ACOE), Waterways Experimental Station, 1992. *Draft Part I RCRA Facility Investigation Phase III Soils Report for: Ammunition Burning Ground, SWMU #03/10 Naval Surface Warfare Center, Crane, Indiana*. November.

APPENDIX A INSPECTION ITEMS



Checklist Title

**DECONTAMINATION FACILITY
INSPECTION**

Inspection Code

DF-01

Revision Date

JAN 95

Checklist

Page 1 of 1

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Has a decontamination area been constructed in accordance with the work plan ?			
2	Are fluids used for decontamination contained at the decontamination area ?			
3	Are fluids disposed of properly on a regular basis ?			
4	Are run-on/ run-off measures in place ?			
5	Have any leaks/seepage occurred since the last inspection ?			
6	Is the containment system still in good repair (no holes, tears, or cracks) ?			
7	Is the decontamination area still in good condition ?			
8				
9				
10				

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number

NSWC Crane-Delivery Order 0009

Drawing Number

Work Package Number

Inspection Report

Sheet of



MORRISON KNUDSEN CORPORATION
Engineering, Construction, & Environmental

Procedure Type

FIELD INSPECTION CHECKLIST

Checklist Title

**PIPING
HYDRO/PNEUMATIC TEST RECORD**

Inspection Code

PI-2

Revision Date

DEC 94

Checklist

Page 1 of 1

SYSTEM DESCRIPTION

System Name
Groundwater Treatment Influent Piping

System Number
Delivery Order 0009

System Location
NSWC Crane

Referenced Drawings

Boundary Description

(Marked up Drawings Are, or, Are Not Attached)

TEST DESCRIPTION/REQUIREMENTS

TYPE	TEST:	PRESSURES	TEMPERATURES
<input type="checkbox"/> Hydrostatic	Code _____	Test _____	Ambient _____
<input type="checkbox"/> Pneumatic - Bubble	Procedure <u>Work Plan</u>	Maximum _____	Medium _____
<input type="checkbox"/> Pneumatic - Vacuum	Medium <u>Water</u>	Inspection _____	Design _____
<input type="checkbox"/> _____	Hold Time <u>Two Hour</u>	Design _____	

TEST RECORD

TEST DATE:					
Test Gage No.	Calibration Due Date	Gage Range			
Test Gage No.	Calibration Due Date	Gage Range			
	TIME	AMBIENT TEMPERATURE	MEDIUM TEMPERATURE	TEST PRESSURE	INSPECTION PRESSURE
Start					
Finish					

TEST RESULTS

<p>TEST ACCEPTED:</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Info Only</p>	<p>If No, explain:</p>
---	-------------------------------

ORGANIZATION	TITLE	SIGNATURE	DATE
Constructor			
MK Superintendent			
MK Quality			
Customer			
Other			
Other			

--	--	--	--

MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
---	----------------	---------------------	---



Checklist Title

**PIPING
UNDERGROUND INSTALLATION**

Inspection Code

PI-1

Revision Date

DEC 94

Checklist

Page 1 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
1	Observe that pipe, fittings, and accessories are handled in such a manner as to avoid damage by impact, abrasions, or other causes.			
2	Check mechanical or finished ends for damage and pipe interior for dirt and foreign material, where accessible.			
3	Assure gaskets, lubricants, compounds, and other mechanical joint materials are handled and stored in accordance with manufacturer's recommendations.			
4	Assure all piping, fitting, and accessory materials are in accordance with job specifications.			
5	Assure all piping is laid in straight lines to alignment shown on drawings and to uniform grades between elevations shown on drawings at terminal structures, change of direction, and other locations.			
6	Check coatings or wrapping for damage before and during installation.	N/A		
7	Assure joints are in accordance with manufacturer's recommendations.			
8	Observe that welds are made by a qualified welder.	N/A		
9	For mechanical joints, assure the recommendations and/or specifications of the manufacturer of the pipe, fittings, and joint material for the lubrication and assembly of the joints are adhered to.	N/A		
10	Verify that bolts on flanges are properly tightened.	N/A		

REMARKS:

Specific Item Identification or Location, as applicable:

MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet _____ of _____
---	----------------	---------------------	---



Checklist Title

**PIPING
UNDERGROUND INSTALLATION**

Inspection Code

PI-1

Revision Date

DEC 94

Checklist

Page 2 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
11	Assure piping is placed correctly in trench.			
12	Assure end surfaces are clean when joints are made.			
13	Assure trench width and depth are as specified on drawings.			
14	Assure bedding material is as specified by the Work Plan.			
15	Assure bedding material has been compacted to a density as required by the applicable code or standard.			
16	Check trench bedding for proper grading to provide a solid, continuous, uniform bearing for each section of pipe.			
17	Assure trenches are free of standing water.			
18	Verify that backfilling between joints will restrict any pipe movement during a hydro/pneumatic test.			
19	Assure all required inspections, tests, hydrostatic/pneumatic tests, and/or NDE work for the piping has been performed.			
20	Verify that the pipe/weld areas have wrapped as required by specification.	N/A		
21	Verify that DIPRA (spark) testing has been performed and the wrapping repaired where indicated.	N/A		
22	Assure all inspectors with jurisdictional authority of the applicable codes have witnessed the required inspections and tests, or have waived the witness/hold point.			
23	Check to see backfilling is carried on simultaneously on both sides of pipe to avoid injurious side pressure.	N/A		

Specific Item Identification or Location, as applicable:

MK Project Number

NSWC Crane-Delivery Order 0009

Drawing Number

Work Package Number

Inspection Report

Sheet of



Checklist Title

**PIPING
UNDERGROUND INSTALLATION**

Inspection Code

PI-1

Revision Date

DEC 94

Checklist

Page 3 of 3

ITEM NO.	ITEM CHECKED	A/R	INSPECTION NUMBER/REMARKS	VERIFIED BY DATE
24	Assure backfill material is placed in lift thicknesses specified in the Work Plan and compacted as required.			
25	Assure backfill material is free from roots, brush, debris, or other perishable or objectionable matter that might cause subsequent settling.			
26	Verify that all tests, inspections, and NDE have been documented and the reports filed.			

PROVIDE DETAILED SKETCH:

(This area is reserved for a detailed sketch of the inspection item.)

Specific Item Identification or Location, as applicable:

MK Project Number NSWC Crane-Delivery Order 0009	Drawing Number	Work Package Number	Inspection Report Sheet of
---	----------------	---------------------	-------------------------------

TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN

SUPPLEMENT TO WORK PLAN FOR SOLID WASTE MANAGEMENT UNITS #03/10, #10/15, #12/14, #13/14, and SOILS BIOREMEDIATION FACILITY

NSWC CRANE
Crane, Indiana

April 14, 1995
Revision A

Prepared by:

MORRISON KNUDSEN CORPORATION
under
CONTRACT #N62467-93-D-1106
DELIVERY ORDER #0009
STATEMENT OF WORK #0007

Approvals:

MK Health and Safety Program Manager

Date

MK Project Manager

Date

MK Program Manager

Date

Acceptance:

U.S. Navy Responsible Authority

Date

**TASK-SPECIFIC SITE SAFETY AND HEALTH PLAN
FOR
REMEDATION ACTIVITIES
AT
NSWC CRANE SWMUs #03/10, #10/15, #12/14, #13/14,
AND
SOILS BIOREMEDIATION FACILITY
CRANE, INDIANA**

SPECIAL NOTICE

This Task-Specific SSHP does not include analysis of the start-up, maintenance, and operation of the Groundwater Treatment Facility or the Bioremediation Facility (Composting Facility) and support equipment. A Revision to this SSHP is required when the facility nears construction completion and all process parameters, throughputs, and Vendor Operations and Maintenance Manuals are available for review of the procured and installed equipment.

The MK NSWC Crane Project Manager is directly responsible for ensuring that this task is completed and the document revision is approved in accordance with project procedures.

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION	1
1.1 WORK TASK SUMMARY	1
1.2 CONTAMINANT CHARACTERISTICS	2
1.3 REFERENCES	3
2.0 SAFETY AND HEALTH HAZARDS SUMMARY	5
2.1 OVERVIEW	5
2.2 ACTIVITY HAZARD ANALYSES	5
2.3 CHEMICAL HAZARDS	6
2.4 CONSTRUCTION SAFETY HAZARDS	6
2.4.1 Physical Hazards	6
2.4.2 Noise	6
2.4.3 Adverse Weather Stress	6
2.4.4 Excavations	6
2.4.5 Overhead Power Lines	7
2.4.6 Underground Utilities	7
2.4.7 Fire and Explosion	7
2.4.8 Hazardous Energy Control (Lockout/Tagout)	7
2.4.9 General Safety Hazards	8
2.4.10 Vehicular Traffic and Work-Site Control Hazards	8
2.4.11 Clearing and Grubbing	8
2.4.12 Access and Haul Roads	8
3.0 RESPONSIBILITIES AND AUTHORITIES SUMMARY	9
3.1 PROJECT MANAGER	9
3.2 SUPERINTENDENT	9
3.3 CERTIFIED INDUSTRIAL HYGIENIST	9
3.4 SITE SAFETY AND HEALTH OFFICER	10
3.5 SUBCONTRACTORS	10
3.6 NEAREST EMERGENCY MEDICAL FACILITY	10
4.0 TRAINING REQUIREMENTS SUMMARY	11
4.1 HAZARDOUS WASTE OPERATIONS INITIAL TRAINING	11
4.2 HAZARDOUS WASTE OPERATIONS ANNUAL REFRESHER TRAINING	11
4.3 HAZARDOUS WASTE OPERATIONS SUPERVISOR/MANAGER TRAINING	11
4.4 SITE-SPECIFIC TRAINING	11
4.5 SAFETY MEETING	12
4.6 CONFINED SPACE ENTRY TRAINING	12
4.7 RESPIRATORY PROTECTION	12

SECTION	PAGE
4.8 HAZARD COMMUNICATION	12
4.9 CPR/FIRST AID	12
4.10 ASBESTOS TRAINING	13
4.11 INORGANIC LEAD TRAINING	13
4.12 CADMIUM TRAINING	13
4.13 INORGANIC ARSENIC TRAINING	13
4.14 SUBSTANCE-SPECIFIC TRAINING	13
4.15 DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS TRAINING	13
4.16 PLAN-OF-THE-DAY MEETINGS	13
4.17 PRE- AND POST-ENTRY BRIEFINGS	14
4.18 RECORDKEEPING	14
4.19 TRAINING REQUIREMENTS MATRIX	14
5.0 MEDICAL SURVEILLANCE PROGRAM REQUIREMENTS	15
5.1 SUMMARY	15
5.2 DRUG ABUSE PREVENTION PROGRAM	16
5.3 RECORDKEEPING	16
6.0 PERSONAL PROTECTIVE EQUIPMENT	17
7.0 MONITORING AND SAMPLING	18
7.1 GENERAL	18
7.2 MONITORING	18
7.2.1 Volatile Organic Compounds	18
7.2.2 Airborne Dust	19
7.2.3 Confined Space Monitoring	19
7.2.4 Perimeter Monitoring	19
7.2.5 Noise Monitoring	20
7.2.6 Heat Stress and Cold Stress Monitoring	20
7.2.7 Carbon Dioxide Monitoring	21
7.2.8 Percent LEL, Oxygen, and Hydrogen Sulfide Monitoring	21
7.2.9 Ionizing Radiation Monitoring	21
7.3 AIR SAMPLING	22
7.3.1 Organic Compounds	22
7.3.2 Inorganic Lead	22
7.3.3 Welding/Cutting Fumes	22
7.3.4 Asbestos	22
7.3.5 Cadmium	22
7.3.6 Inorganic Arsenic	23
7.3.7 Explosives Residues	23
7.3.8 Biological Hazards	23
7.3.9 PCB Hazards	24

SECTION	PAGE
7.4 AIR MONITORING AND SAMPLING REQUIREMENTS	24
7.5 RECORDKEEPING AND CHAIN OF CUSTODY	24
8.0 SAFETY AND HEALTH WORK PRECAUTIONS AND PROCEDURES	25
8.1 GENERAL	25
8.2 OPERATIONS SAFETY	25
8.2.1 Safety Meetings	25
8.2.2 General Safety Rules and Procedures	25
8.3 WORK SITE PRACTICES	27
8.4 HAZARD COMMUNICATION	28
8.5 EXCAVATIONS	28
8.6 PRE-ENTRY BRIEFINGS	28
8.7 WORK SITE CONTROL	28
9.0 WORK ZONES	29
9.1 EXCLUSION ZONE	29
9.2 CONTAMINATION REDUCTION ZONE	30
9.3 SUPPORT ZONE	30
9.4 CONSTRUCTION ZONE	30
9.5 WORK ZONE CONTROLS	31
10.0 PERSONNEL AND EQUIPMENT DECONTAMINATION AND HYGIENE PROCEDURES	32
10.1 PERSONNEL DECONTAMINATION	32
10.2 EQUIPMENT DECONTAMINATION	33
10.3 WASHING FACILITIES	33
10.4 DECONTAMINATION WASH WATER	33
10.5 PERSONAL HYGIENE	33
11.0 ON-SITE FIRST AID AND EQUIPMENT	34
11.1 FIRST-AID AND CPR TRAINING	34
11.2 FIRST AID AND MEDICAL FACILITY REQUIREMENTS	34
11.3 REPORT OF FIRST AID CASES	34
12.0 EMERGENCY RESPONSE PLAN AND CONTINGENCY PROCEDURES ...	36
12.1 GENERAL	36
12.2 PRE-EMERGENCY PLANNING	36
12.3 RESPONSIBILITIES	37
12.3.1 Site Personnel	37
12.3.2 Project Manager	37
12.3.3 Certified Industrial Hygienist	37
12.3.4 Site Safety and Health Officer	38
12.3.5 Subcontractors	38

SECTION	PAGE
12.4 EMERGENCY RECOGNITION AND PREVENTION	38
12.5 SAFETY ZONES	38
12.6 SITE SECURITY AND CONTROL	38
12.7 EVACUATION ROUTES	38
12.8 EMERGENCY DECONTAMINATION	38
12.9 EMERGENCY MEDICAL TREATMENT AND FIRST AID	39
12.10 COMMUNICATIONS	39
12.11 CRITIQUE OF RESPONSE AND FOLLOW-UP	39
12.12 PPE AND EMERGENCY EQUIPMENT	39
12.13 SITE TOPOGRAPHY, LAYOUT AND PREVAILING WIND CONDITIONS	39
12.14 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS	40
 13.0 LOGS, REPORTS, AND RECORDKEEPING	 44
13.1 SAFETY AND HEALTH LOGBOOK	44
13.2 REPORTS	44
13.3 RECORDKEEPING	45
 14.0 ON-SITE WORK PLANS	 46
 15.0 COMMUNICATION PROCEDURES	 47
15.1 RADIO COMMUNICATION	47
15.2 TELEPHONE	47
15.3 EMERGENCY ALARM	47
15.4 DRILLS AND EXERCISES	47
 16.0 SPILL CONTAINMENT PLAN	 48
16.1 GENERAL	48
16.2 PREPLANNING FOR SPILL CONTROL	48
16.3 SPILL AND FIRE CONTROL MATERIALS AND EQUIPMENT	49
16.4 SPILL CONTROL MEASURES	50
16.5 DRUM, CONTAINER, AND TANK HANDLING AND MOVING PROCEDURES	50
16.6 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS	51
 17.0 CONFINED SPACES	 52

LIST OF TABLES

TABLE		PAGE
1	Site Description and Contaminants	54
2	Potential Contaminants	55
3	Personnel Names and Telephone Numbers	60
4	Training Requirements	62
5	Selection of Personal Protective Equipment	63
6	Minimum Personal Protective Equipment Requirements by Task	64
7	Airborne Contaminant Response Criteria	65
8	Frequency of Physiological Monitoring for Fit and Acclimatized Workers	68
9	Monitoring and Sampling Requirements	69

LIST OF FIGURES

FIGURE		PAGE
1	Excavation and Trenching Permit	71
2	Hot Work Permit	72
3	Directions to Nearest Emergency Medical Facilities	73
4	Pre-Entry Briefing Signature Sheet	74
5	Meeting Signature Sheet	75
6	SSHP Daily Inspection Checklist	76

APPENDICES

APPENDIX		PAGE
A	ACTIVITY HAZARDS ANALYSIS (AHA)	A-1
B	WORK ZONE MAPS	B-1

1.0 INTRODUCTION

This Task-Specific Site Safety and Health Plan (SSHP) describes safety and health requirements for interim cleanup measures at NSWC Crane, specifically for Solid Waste Management Units (SWMUs) #03/10, #10/15, #12/14, AND #13/14 and the Soils Bioremediation Facility. This SSHP is consistent with requirements of the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Site Regulations; 29 CFR 1910.120 and 29 CFR 1926.65; and the U.S. Army Corps of Engineers (ACOE) *Safety and Health Requirements Manual* EM 385-1-1, dated October 1992.

This SSHP is applicable to all personnel who enter work areas described in this SSHP and who are under the control of Morrison Knudsen Corporation (MK) or MK's subcontractors.

Two reports were reviewed in the preparation of this SSHP: *RFI Phase II Soils Report for Rockeye* (ACOE 1992) and *Final RCRA Facility Investigation Phase I EMR SWMU 19/00, 08/17/23/14 and 13/14* (Halliburton 1992).

1.1 WORK TASK SUMMARY

SWMU #03/10 Ammunition Burning Ground (ABG) - The scope of work includes excavation and removal of approximately 60,000 cubic yards of soil contaminated with explosives residuals, volatile organics, heavy metals, pesticides and herbicides; transport to the Soils Bioremediation Facility; soil sampling; and site restoration. Groundwater will be recovered using four extraction wells and pumped to a treatment facility. The extraction wells and well pumps will be installed by others. MK will manage the construction, start-up, initial year of operation, and turn-over to NSWC.

SWMU #10/15 Rockeye - Excavation and removal of approximately 18,000 cubic yards of explosives-residual contaminated soil, transport to the composting facility, soil sampling, and site restoration.

SWMU #12/14 Mine Fill A - Excavation and removal of approximately 11,000 cubic yards of explosives-residual contaminated soil, transport to the composting facility, soil sampling, and site restoration.

Facility #12/13 Mine Fill B - Excavation and removal of approximately 22,000 cubic yards of explosives-residuals and heavy-metals contaminated soil and 1,800 cubic yards of PCB-contaminated soil, transport to the composting facility or off-site TSD facility (for PCB-contaminated soils), soil sampling, and site restoration.

Soils Bioremediation Facility - Facility to be constructed east of Bunker 828 which is located on H-280 just off H-54. Explosives contaminated soils will be received at this facility from on-site SWMUs. The contaminated soil will be processed using soil screening; soil mixing with amendments; and composting in covered structures. Support subsystems include rock crushing and washing, and decontamination and runoff water processing.

Amendments that will be mixed with the contaminated soils may include wood material, animal manure, and vegetable wastes. Construction activities will include site preparation; installation of a sloped compost pad with collection sumps; temporary building enclosure over the pad with necessary utilities; temporary office facilities and work areas; decontamination pad; installation of soil processing equipment.

The scope of work is summarized in Table 1. Detailed task descriptions are provided in Section 4.0 of the Work Plan.

1.2 CONTAMINANT CHARACTERISTICS

The potential contaminants for each SWMU and the Soils Bioremediation Facility are summarized below. Material Safety Data Sheets (MSDSs) or National Institute for Occupational Safety and Health (NIOSH) Pocket Guides will be used as a source of information to help personnel recognize and control occupational chemical hazards. MSDS and NIOSH information for each of the potential contaminants, process chemicals, or other chemical substances encountered during the interim cleanup process will be organized into a separate binder, commonly called the "MSDS Binder." These binders will be available to all personnel, at anytime, and will be at appropriate on-site locations such as the MK job-site trailer, NSWC Medical Building, and each active work area. Additional information concerning potential contaminants is presented in Table 2.

SWMU #03/10 Ammunition Burning Ground (ABG) - Soil containing residues of 2,4-DNT, 2,6-DNT, TNT, Tetryl, DNB, RDX and HMX. Soils were also determined to contain various metals, pesticides, and herbicides. Groundwater was determined to be contaminated with RDX, HMX, and TNT, the organics trichloroethene (TCE) and tetrachloroethene, and barium.

SWMU #10/15 Rockeye - Soil containing residues of TNT, HMX and RDX. Metals, cyanide, methylene chloride and PCBs are all below TCLP action levels.

SWMU #12/14 Mine Fill A - Soil containing residues of TNT, HMX and RDX. PCB contamination to include Aroclor 1242, 1254, and 1260.

Facility #12/13 Mine Fill B - Soil containing residues of TNT, HMX, and RDX. 2,4-DNT and TNB were detected only in one sample. Metals include antimony, beryllium,

arsenic, cadmium, chromium, lead, copper, nickel, zinc, barium, aluminum, cobalt, iron, and magnesium.

The potential contaminants contained in the soils to be received at the Soils Bioremediation Facility are summarized below for each SWMU.

SWMU #03/10 Ammunition Burning Ground (ABG) - Soil containing residues of 2,4-DNT, 2,6-DNT, TNT, Tetryl, DNB, RDX, and HMX. Soils were also determined to contain various metals, pesticides, and herbicides.

SWMU #10/15 Rockeye - Soil containing residues of TNT, HMX, and RDX. Metals, cyanide, methylene chloride and PCBs are all below TCLP action levels.

SWMU #12/14 Mine Fill A - Soil containing residues of TNT, HMX, and RDX. (PCB-contaminated soils, including Aroclor 1242, 1254, and 1260, will be sent to an off-site TSD.)

SWMU #12/13 Mine Fill B - Soil containing residues of TNT, HMX, and RDX. 2,4-DNT and TNB were detected only in one sample. Metals to include antimony, beryllium, arsenic, cadmium, chromium, lead, copper, nickel, zinc, barium, aluminum, cobalt, iron, and magnesium.

1.3 REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH), 1993-1994. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices*. Second Printing.

Halliburton NUS, 1992. *Final RCRA Facility Investigation Phase I EMR SWMU 19/00, 08/17/12/14, and 13/14, NSWC Crane, Indiana*. August.

Morrison Knudsen Corporation (MK), MK-Ferguson Group, 1989. *Safety Manual*. January.

MK, EC&E Group, 1994a. *Industrial Hygiene Procedures Manual*. Rev. 0. April.

MK, 1994b. *Accident Prevention Plan For Naval Facilities Engineering Command Southern Division*, Prepared by Morrison Knudsen under contract N62467-93-D-1 106. Rev. 0. May 20.

MK, 1994c. *Safety and Health Program Description for Hazardous Waste Operations*. Rev. 1. September.

MK, 1994d. NAVFAC SouthDiv Project Procedures:

PHSP 001.1, Hazardous Energy Control (Lockout/Tagout), 11/4/94.

PHSP 002.1, Emergency Response, 11/4/94.

PHSP 003.1, Spill Response, 11/4/94.

PHSP 005.1, Excavations, 11/4/94.

MK, 1994e. *White Paper on Composting Technology*. December.

NIOSH/OSHA/USCG/EPA, 1985. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*. DHHS (NIOSH) Publication No. 85-115. October.

NIOSH, 1990. *Pocket Guide to Chemical Hazards*.

Naval Energy and Environmental Support Activity (NEESA), 1983. *Initial Assessment Study of NSWC, Indiana; NEESA 13-0003, NSWC Crane, Indiana*. May.

OSHA, 1993. *Limits for Air Contaminants*, Title 29 CFR Part 1910 Section 1000, Table Z-1, July 1, 1993 revision.

U.S. Army Corps of Engineers (ACOE), 1992. *RFI Phase II Soils Report for Rockeye, SWMU 10/15, NSWC Crane, Indiana*. IN5 170 023 498. July.

2.0 SAFETY AND HEALTH HAZARDS SUMMARY

This section describes the potential safety and health hazards anticipated for SWMUs #03/10, #10/15, #12/14, and #13/14 and the Soils Bioremediation Facility.

2.1 OVERVIEW

Hazards at this site include construction safety hazards associated with heavy equipment; soil excavation and penetrations, and potential contact with underground utilities and undermining of structural supports in Mine Fill A and B; inclined walking and working surfaces; traffic control including haul road layout; energy control (electrical and other kinetic energy sources) or other utility lines; site restoration including backfilling and compaction; eye/head/feet physical hazards; and heat and cold stress.

During construction of the Bioremediation Facility, the potential risk of acute exposure to chemical contaminants is considered low. During operations, the potential risk of acute exposure to the chemical contaminants listed in Table 2 is considered low if the engineering controls, administrative controls, and personal protective equipment (PPE) requirements are strictly adhered to. The highest risk chemical contaminants are TNT and RDX. Controls in place for the explosives will also meet or exceed the controls necessary for protection from the heavy metals.

The Soils Bioremediation Facility processing equipment must be designed to minimize dust release and safeguarded to prevent employee contact with rotating equipment. The general ventilation system in the Compost Building must be sufficient to maintain the concentration of carbon dioxide to an acceptable level. When the design of the compost building and selection of the equipment for windrow composting is finalized, additional analysis can determine the man-machine interface hazards and the potential for personnel exposure to biological hazards from microbes associated with the composting process.

A Department of Defense (DOD) Hazard Review is required on all Bioremediation Facility process equipment to assess component sensitivity to explosive contaminants. The subcontractor is responsible for completing the analysis with approval from MK and the Navy.

2.2 ACTIVITY HAZARD ANALYSES

Activity hazard analyses have been prepared for each anticipated task according to EM 385-1-1 (ACOE 1992). These hazard analyses are in Appendix A. Site activity will be reviewed by the attending superintendent and safety personnel to determine if the prepared activity hazard analysis adequately addresses the planned work task. If the

activity hazard analysis is inadequate, further analysis will be performed, and a revised activity hazard analysis will be prepared.

2.3 CHEMICAL HAZARDS

The potential chemical contaminants, their exposure limits, sign and symptoms of overexposure, and first aid requirements are presented in Table 2.

2.4 CONSTRUCTION SAFETY HAZARDS

2.4.1 Physical Hazards

Physical hazards on this project include the use of heavy equipment such as dump trucks, backhoes and excavators; and tripping and slipping from walking and working surfaces. Project personnel will receive site-specific and safety training, discussed later, to orient them to these potential hazards.

2.4.2 Noise

Operations may generate noise levels that exceed allowable limits. Hearing protection is required when noise levels exceed 85 dBA steady state or 140 dBA impulse, regardless of the exposure duration. Hearing protection will be provided to all field personnel. A comprehensive Hearing Conservation Program will be implemented when noise levels equal or exceed 85 dBA on an 8-hour time weighted average.

2.4.3 Adverse Weather Stress

All employees are to be alert to the signs and symptoms of heat stress. Should any of the following symptoms occur—extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, pale clammy skin—the employee is to immediately leave the work area, rest, cool off, and drink plenty of cool water. If the symptoms do not subside after a reasonable rest period, the employee shall notify the supervisor or the Site Safety and Health Officer (SSHO) or medical assistance. The SSHO will observe site personnel for signs of heat stress and increase the frequency of breaks and fluid consumption as necessary. Refer to Section 7.2.6 for additional guidance on heat and cold stress management.

2.4.4 Excavations

Accidental falls into an excavation or side wall collapse are potentially hazardous to both personnel and equipment in or near excavations. Refer to MK project procedure PHSP 005.1 for specific excavation requirements.

An Excavation and Trenching Permit shall be required prior to excavation, trenching, or ground penetrating operations are planned. Figure 1 depicts the MK Excavation and Trenching Permit.

2.4.5 Overhead Power Lines

Overhead high-voltage lines present an electrocution hazard. Work conducted in proximity of overhead power lines will be performed in accordance with the requirements in EM 385-1-1, Section 11.E.

2.4.6 Underground Utilities

Excavation of underground utilities pose hazards such as fire and/or explosion from gaslines, electrocution from power lines, and flooding from water lines. Positive identification of underground utilities and services is required. Underground utilities will be located in accordance with MK procedure PHSP 005.1. If hazardous energy control is anticipated for underground utilities, the requirements of MK procedure PHSP 001.1 shall be followed.

2.4.7 Fire and Explosion

An Unexploded Ordnance Survey (UXO) will be required prior to subcontractor mobilization and may continue throughout the excavation process. The UXO Survey will be conducted by NSWC personnel.

No hot work or open flames will be allowed in the work area without a Hot Work Permit. The MK Hot Work Permit is depicted in Figure 2. Hot Work Permitting will be coordinated through the base Fire Department. If fire or explosion hazards exist, all tools will be of the non-sparking type. Electrical pumps and blowers will be bonded or grounded to reduce hazards associated with static discharge. Portable power tools used in hazardous atmospheres shall be explosion proof, in accordance with the National Fire Protection Association (NFPA) 70B and 70E, Class 1, Division 1, Group D unless otherwise approved.

Fire fighting equipment shall include at least one 40-lb or equivalent "ABC" multi-purpose fire extinguisher maintained at the entrance to the Contamination Reduction Zone (CRZ). All heavy equipment and vehicles will be fitted with a minimum 10-lb "ABC" fire extinguisher. Job-site trailers and temporary structures will have fire extinguishers installed in accordance with NFPA 10.

2.4.8 Hazardous Energy Control (Lockout/Tagout)

Any system with the potential for unexpected energizing, start-up, or release of potential or kinetic energy during the servicing and maintenance of the system shall be

isolated in accordance with MK procedure PHSP 001.1. The Superintendent is responsible for energy control. The on-site Public Works Department (PWD) will provide energy control services for site utilities. MK will coordinate these services.

2.4.9 General Safety Hazards

Other potential safety hazards include slipping, falling, head trauma, back strains from lifting heavy objects, insect and snake bites, and similar hazards. All project personnel will wear appropriate PPE for the required work activity. As a minimum, Level D protection (hard hats, steel-toed boots and eye protection) will be required in all work areas. First-aid facilities will be available on-site for minor injuries. Local emergency response organizations will be notified of work activities to deal with emergencies.

2.4.10 Vehicular Traffic and Work-Site Control Hazards

Potential hazards from vehicular traffic around work areas including the Soils Bioremediation Facility will be controlled by using traffic control items such as traffic cones, flagging, barricades, and signage. Types and placement of traffic control items will be in accordance with EM 385-1-1, Section 8 and 29 CFR 1926.201 and 202.

2.4.11 Clearing and Grubbing

Clearing and grubbing of work sites will be completed in accordance with EM 385-1-1 Section 31.

2.4.12 Access and Haul Roads

If special access and haul roads are required and constructed for this project, they will be constructed in accordance with EM 385-1-1 Section 21.I.

3.0 RESPONSIBILITIES AND AUTHORITIES SUMMARY

This section describes the safety and health responsibilities of project personnel. Ultimately, the responsibility for the safety and health lies with the individual. All personnel must be aware of project hazards and the methods of reducing the risk of injury and illness. All personnel will comply with the rules and procedures set forth in this plan and will make project management aware of any conditions that may jeopardize the welfare of project workers and/or the public. Names and telephone numbers of responsible persons are listed in Table 3.

3.1 PROJECT MANAGER

The Project Manager (PM) is responsible for managing all aspects of the project, including safety and health. The PM is responsible for ensuring all project tasks receive appropriate safety and health review and that the necessary equipment and facilities are available to implement the SSHP before commencement of field activities.

3.2 SUPERINTENDENT

The Superintendent is responsible for ensuring that the safety and health aspects for their particular task are addressed. He is responsible for implementing the SSHP in the field and for ensuring that all project personnel comply with provisions of the plan. The Superintendent is also responsible for notifying the SSHO of any changes in work conditions that may affect the safety and health aspects of the task. The Subcontractor Superintendent or designated supervisor is responsible for conducting Plan-of-the-Day meetings, pre-entry and post-entry job briefings, weekly safety meetings, and conducting or ensuring that other training is completed.

The Superintendent must notify the SSHO of all accidents as soon as practical and shall conduct an accident investigation for each accident and record the results of the investigation on a Supervisor Accident Investigation Report form or equivalent form.

3.3 CERTIFIED INDUSTRIAL HYGIENIST

The Certified Industrial Hygienist (CIH) is responsible for preparing the SSHP. The CIH is also responsible for modifying the SSHP and recommending changes to the work tasks if they affect safety and health. The CIH is responsible for ensuring that all required sampling/monitoring is performed and that all required safety and health documentation is maintained. The CIH may assign some job tasks to the SSHO.

3.4 SITE SAFETY AND HEALTH OFFICER

The SSHO is responsible for the day-to-day implementation of the SSHP and verification of compliance with the SSHP and all applicable occupational safety and health rules and regulations. The SSHO has the authority to suspend work any time if there is an imminent threat to the health and safety of project workers or the public. The SSHO will ensure that the Navy's designated on-site authority is notified immediately of any accident including spills. The SSHO will assist in the accident investigation effort and shall have final approval authority for accident reports.

3.5 SUBCONTRACTORS

All subcontractors are required to abide by the requirements of this SSHP. They are also required to comply with all applicable and appropriate federal, state, and local laws, standards, and regulations. Subcontractors must notify the SSHO of all accidents as soon as practical. Subcontractors must maintain records of all first aid recordable and lost time injuries, and notify the SSHO of any changes in work conditions that may affect the safety and health aspects of the task.

3.6 NEAREST EMERGENCY MEDICAL FACILITY

Directions to the On-Site NSWC Medical Department:

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of road H-2, just north of H-5.

Directions to Bedford Medical Center:

From the Bloomington Gate, head east on Highway 58 to the city of Bedford, then turn left onto 16th Street. The distance to hospital is approximately 20 miles.

Directions to Bloomington Hospital:

Exit NSWC on road H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street; the hospital will be on right-hand side of the road.

Note: Refer also to Table 3 and Figure 3.

4.0 TRAINING REQUIREMENTS SUMMARY

This section summarizes training requirements for project personnel.

For the Soils Bioremediation Facility, modifications to training requirements are permitted for clean new construction. Training requirements identified in paragraphs 4.1, 4.2, 4.3, 4.10, 4.11, 4.12, 4.13, 4.15 are not applicable. Section 4.4 training can be modified for tasks at hand and 4.17 can be changed from Pre-Entry Briefs to Tool Box Safety Meetings. All training listed below is applicable to start-up and operations of the facility.

4.1 HAZARDOUS WASTE OPERATIONS INITIAL TRAINING

All personnel entering a contamination reduction zone or exclusion zone shall have completed the initial 40-Hour Hazardous Waste Operations Safety and Health Training and three days of supervised experience pursuant to 29 CFR 1910.120(e)(3).

4.2 HAZARDOUS WASTE OPERATIONS ANNUAL REFRESHER TRAINING

All personnel shall receive eight hours of refresher training annually, pursuant to 29 CFR 1910.120(e)(8), as necessary.

4.3 HAZARDOUS WASTE OPERATIONS SUPERVISOR/MANAGER TRAINING

All on-site supervisors and managers, and subcontractor superintendents and supervisors shall receive an additional eight hours of specialized training pursuant to 29 CFR 1910.120(e)(4).

4.4 SITE-SPECIFIC TRAINING

All personnel shall receive site-specific training before entering the site or commencing work. All site employees and subcontractor personnel including personnel working in the support zone shall receive this training. The SSHO is responsible for this training. Site visitors shall receive a site-specific briefing before entering an exclusion zone. This training will cover the SSHP and will include, but not necessarily be limited to, the following topics:

- Names of site safety and health personnel.
- Safety, health, and other hazards present on the site.
- PPE requirements.
- Safe work practices.
- Engineering controls.

- Medical surveillance requirements including recognition or symptoms, and signs that might suggest overexposure to hazards.
- Decontamination procedures.
- Emergency procedures.
- Spill containment plan.
- Confined Space Entry.
- Hazardous Energy Control.
- Requirements of this SSHP.

4.5 SAFETY MEETING

The SSHO shall conduct a safety meeting for all site employees and subcontractor personnel at project kickoff and before each change in operation. A safety meeting for all MK and Subcontractor Supervisors shall be conducted at least once per month. The monthly meeting is chaired by the PM or Superintendent with assistance from the SSHO. This training shall be recorded and document the date, time, personnel attending, topics, and instructor. The Safety Meeting shall be recorded in project field log book or separately on the Meeting Signature Sheet (see Figure 4). This meeting is also discussed in Section 8.2.1.

4.6 CONFINED SPACE ENTRY TRAINING

Confined space entry is not anticipated on this project. However, if excavations are to be entered that are greater than 5 feet in depth, the excavation shall be treated as a permit confined space. The excavation can be downgraded to nonpermit confined space, if authorized, based on initial and periodic air monitoring and if engineering controls are in place to safeguard the excavation from collapse.

4.7 RESPIRATORY PROTECTION

All personnel required to use respiratory protection will be trained in respirator use, care, and maintenance pursuant to 29 CFR 1926.103 and 29 CFR 1910.134.

4.8 HAZARD COMMUNICATION

All personnel will complete hazard communication training pursuant to 29 CFR 1910.1200 and 29 CFR 1926.59 regarding all potentially hazardous chemicals to which they might be exposed.

4.9 CPR/FIRST AID

The SSHO and at least one other site worker at each work site shall be certified in basic first aid and CPR by the American Red Cross or equivalent organization.

4.10 ASBESTOS TRAINING

Not anticipated for this project.

4.11 INORGANIC LEAD TRAINING

All personnel working on any of the SWMUs where inorganic lead contamination could be present shall receive training on the OSHA lead standard, 29 CFR 1926.62.

4.12 CADMIUM TRAINING

All personnel working with contaminated soil from SWMUs #03/10 and #10/15, where cadmium contamination is present, shall receive training on the OSHA Cadmium Standard, 29 CFR 1926.63 and 1910.27.

4.13 INORGANIC ARSENIC TRAINING

All personnel working with contaminated soil from SWMUs #03/10 and #10/15, where inorganic arsenic contamination is present, shall receive training on the OSHA Inorganic Arsenic Standard, 29 CFR 1910.1018 and 1926.1118.

4.14 SUBSTANCE-SPECIFIC TRAINING

In the event that the OSHA regulations regarding other contaminants or hazards become applicable, substance-specific training pursuant to the subject regulation will be performed as appropriate for project personnel.

4.15 DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS TRAINING

All personnel required to classify, mark, select packaging, inspect, load, and transport hazardous materials must be trained to U.S. Department of Transportation (DOT) 49 CFR Part 172 Subpart H.

4.16 PLAN-OF-THE-DAY MEETINGS

Plan-of-the-Day Meetings shall be held at the beginning of each shift to review the planned work and any safety and quality concerns. The date, time, personnel attending, and meeting minutes shall be documented in project field log books or separately on a Meeting Signature Sheet, as shown on Figure 4. The Plan-of-the-Day meeting is also discussed in Section 8.2.1.

4.17 PRE- AND POST-ENTRY BRIEFINGS

Pre-entry briefings shall be held for employees prior to their initiating any new or differing site activities and at such other times as necessary. These briefings ensure employees are knowledgeable of the plan/activity, hazard analysis, and that the plan/activity and hazard analysis are being followed.

Post-entry briefings shall be held as needed to ensure changes in conditions or work methods are promptly reported and addressed. In addition, all incidents will be promptly evaluated. The results of these evaluations will be communicated to personnel in post-entry briefings and other meetings. Lessons learned from these evaluations shall be communicated to all affected personnel. Pre- and Post-Entry Briefings are also discussed in Section 8.6.

4.18 RECORDKEEPING

Written records of all required training and briefings shall be maintained on-site by the SSHO. These records shall be made available to U.S. Navy personnel upon request and will be included as part of the project Close-Out Report. Subcontractors to MK shall provide copies of training certification or a letter summarizing each employee training record to the PM or SSHO before mobilization activities on-site.

4.19 TRAINING REQUIREMENTS MATRIX

A training requirements matrix is shown in Table 4.

5.0 MEDICAL SURVEILLANCE PROGRAM REQUIREMENTS

This section describes the medical surveillance program and requirements.

5.1 SUMMARY

All project personnel who work within the EZ for more than three days per month or are required to use respiratory protection within the EZ for any length of the time will participate in a medical surveillance program, as described in this section. Clean or new construction activities will not require participation in the medical surveillance program unless special tasks dictate, as determined by the SSHO.

The medical surveillance program consists of a baseline or initial examination, an annual medical examination, a termination examination, and episodic medical examinations as necessary. **Termination or exit physicals shall be required on this project.**

At a minimum, the content of the initial, annual, and termination examinations shall consist of the following medical tests and procedures (or as determined by the examining physician):

- Medical and occupation history.
- Complete physical examination.
- Pulmonary function test (FVC and FEV 1.0).
- Complete blood count.
- Audiometry.
- Complete urinalysis.
- SMAC-22 biochemical profiles.
- Resting electrocardiogram.
- Creatinine clearance.
- SGPT.
- Vision screen.
- Chest X-ray (PA) (at the direction of the examining physician).

Special Requirement #1. Pre-employment or pre-task baselines will be obtained for heavy metals via 24-hour urine collection and analysis for each MK employee and subcontractor working in any of the SWMU exclusions zones on a routine basis. Metals analyses will include antimony, arsenic, cadmium, and chromium.

Special Requirement #2. Pre-employment or pre-task baselines will be obtained for heavy metals, specifically cadmium and lead via whole blood collection and analysis for each MK employee and subcontractor working in any of the SWMU exclusions zones on a scheduled basis.

An episodic examination will be required if any employee develops signs or symptoms related to the possible overexposure to hazardous substances or other health hazards, if the employee has been injured, or if the employee has been exposed above the permissible exposure limits or published exposure levels in an emergency. The scope of any episodic examination will be left to the discretion of the examining physician.

A copy of the examining physician's written opinion about the employee's ability to perform work on this hazardous waste site and to use respiratory protection, and a statement that the physician has informed the employee of the results of the examination shall be kept on-site. Subcontractors must provide this information to MK before site mobilization.

The examining physician must be provided with the following information:

- Information on the employee's anticipated or measured exposure levels.
- PPE used or to be used.
- A description of the employee's duties as they relate to the employee's exposures.
- A copy of 29 CFR 1910.120 (optional).

5.2 DRUG ABUSE PREVENTION PROGRAM

MK is committed to establishing and maintaining for all employees a safe and efficient work environment that is free from the effects of alcohol, illegal drugs, other controlled substances, and prohibited items. Refer to the Accident Prevention Plan (MK 1994c) for more details on the substance abuse program.

5.3 RECORDKEEPING

Arrangements shall be made with the examining physician(s) or others to ensure long-term storage of medical records is in accordance with 29 CFR 1910.120. Statements by the examining physician(s) attesting to the medical qualification of individual workers shall be maintained at the project site. These statements must not contain the specific results of medical examinations or tests. These statements shall be made available to the SSHO or U.S. Navy personnel upon request.

6.0 PERSONAL PROTECTIVE EQUIPMENT

In addition to engineering controls and work practices, personal protective equipment (PPE) shall be used, as warranted, to protect personnel from exposure to contaminants that may be encountered during site activities. The following guidelines will be followed:

- Respirators and other PPE necessary to protect the health of employees will be provided by their employer.
- Only NIOSH/MSHA-approved respirators will be used.
- The respirator user's medical status will be reviewed prior to performing work that requires respirator use.
- Written standard operating procedures governing the use of respirators and other PPE, as warranted, will be provided.
- Respirators will be assigned to individual employees for their exclusive use and will be marked to indicate to whom the respirator is assigned for the duration of this scope of work.

Table 5 describes the basic levels (Level B, C, Modified D, and D) of PPE.

Table 6 lists the minimum PPE level required for each task or operation. If air sampling/monitoring indicates that modification to the protection level is warranted, the SSHO is empowered to authorize the modification based on the guidance provided in Table 7, Airborne Contaminant Response Criteria.

PPE will be maintained and stored according to the manufacturer's recommendation and good industrial hygiene practices. Personnel will inspect PPE before each use to ensure the PPE is clean and in good working order. Personnel will be trained on PPE inspection criteria.

Where needed, the SSHO will develop and review PPE donning and doffing procedures and train personnel on these procedures. The SSHO will also conduct evaluations of PPE effectiveness. Revisions in PPE selection and use will be made as warranted. Supervisors, in coordination with the SSHO, shall address medical considerations, including work limitations due to temperature extremes, when assigning PPE requirements to personnel.

7.0 MONITORING AND SAMPLING

Air monitoring refers to direct real-time reading of airborne concentrations, and air sampling refers to time-integrated air sampling (either personal or area samples). Monitoring and sampling at the Soils Bioremediation Facility will most likely only apply to start-up and operations.

7.1 GENERAL

This section describes the air sampling and air monitoring program performed to evaluate project worker exposure to potentially hazardous airborne materials and to evaluate off-site impacts. The air sampling/monitoring results will be used to:

- Assess worker exposure to potentially hazardous materials with respect to the Permissible Exposure Limit (PEL) for Air Contaminants (Title 29 Code of Federal Regulations, Part 1910.1000) or other published exposure levels.
- Assess the adequacy of engineering controls and respiratory protection.
- Delineate areas where controls or respiratory protection is needed.
- Establish work control zones.

7.2 MONITORING

7.2.1 Volatile Organic Compounds

A direct-reading, real-time photo-ionization or flame-ionization detection instrument capable of detecting volatile organic compounds (VOCs) will be used whenever excavation and penetration in potentially contaminated areas occurs. Readings will be taken at locations that reflect approximate concentrations of organic vapors and gases in the breathing zone of excavation personnel. Results of the organic vapor and gas monitoring will be documented. If necessary, the level of PPE used by personnel will be modified. Table 7 describes the level of PPE to be used, based on the concentration of organic vapors and gases in the breathing zone of project personnel. The direct-reading real-time organic vapor and gas monitoring equipment will be "response checked" according to the manufacturer's instructions before use each day, and calibrated yearly by the manufacturer or other qualified personnel. Records of the response check, maintenance, and annual calibration will be maintained on-site.

Colorimetric indicator tubes (such as Dräger tubes) will be used at the SSHO's discretion whenever the direct-reading real-time instrument measures breathing zone concentrations of organic gases or vapors at 2 parts per million (ppm) greater than

background concentrations. The following compounds may be measured by colorimetric indicator tubes: benzene, toluene, xylene, ethylbenzene, petroleum hydrocarbons (n-Octane), and trichloroethene (TCE). If benzene or other volatiles are detected, the level of PPE will be upgraded as specified in Table 7, or as determined by the SSHO.

7.2.2 Airborne Dust

A direct-reading, real-time instrument capable of detecting airborne dust (such as MIE Miniram) may be used, based on visible observations of excessive dust. Readings will be taken at locations that reflect approximate concentrations of airborne dust in the breathing zone of project personnel. Results of the airborne dust monitoring will be documented. If necessary, the level of PPE used by personnel will be modified or engineering controls enhanced. The direct-reading, real-time monitoring equipment will be "response checked" according to the manufacturer's instructions before use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site. When such monitoring is conducted and the results are greater than 10 mg/m³ total dust concentrations, immediate steps will be taken to determine the cause, modify site operations, evacuate unprotected personnel and the public if necessary, and notify agency contact personnel.

7.2.3 Confined Space Monitoring

Confined space entry is not anticipated for this project. However, if excavations are to be entered that are greater than 5 feet in depth, the excavation shall be treated as a permit confined space. The excavation can be downgraded to nonpermit confined space based on initial and periodic air monitoring and if engineering controls are in place to safeguard the excavation from collapse. Real-time air monitoring shall be conducted for percent lower explosive limit (LEL), oxygen (O₂), and hydrogen sulfide (H₂S).

7.2.4 Perimeter Monitoring

Perimeter monitoring to evaluate emissions of VOCs will be performed periodically during soil excavation. At a minimum, perimeter monitoring will be performed initially at 2-hour intervals using a direct-reading real-time organic vapor instrument. When such monitoring is conducted and results are 5 ppm higher than background levels of organic vapors, immediate steps will be taken to determine the cause, change site operations, evacuate unprotected personnel and the public if necessary, and notify agency contact personnel.

Perimeter monitoring to evaluate emissions of airborne dust will be performed periodically during soil excavation, as warranted. When such monitoring is conducted and results are greater than 1.0 mg/m³ (10 times less than the TLV-TWA listed in

Section 7.2.2), immediate steps will be taken to determine the cause, modify site operations, evacuate unprotected personnel and the public if necessary, and notify agency contact personnel.

7.2.5 Noise Monitoring

Noise monitoring will be performed, as warranted, at the initiation of each task or operation to determine the sound levels associated with the particular task or operation. Sound levels will be determined at locations that best approximate the sound levels at the ear of potentially affected personnel. Noise monitoring equipment will be "response checked" according to the manufacturer's instructions prior to use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site.

7.2.6 Heat Stress and Cold Stress Monitoring

When temperatures at the site are above 65°F, the wet bulb globe temperature (WBGT) may be monitored to assess the potential for heat stress. Work/rest periods will be adjusted according to the guidelines stated in the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents*⁵. When the clothing worn differs from the ACGIH standard ensemble, such as with workers wearing semipermeable or impermeable, the guidelines established in the NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, Section 8 (NIOSH and others 1985) should be consulted. Section 8 of this document is summarized as follows:

When employees are required to wear impermeable chemical protective clothing in temperatures exceeding 70°F, employees shall use the "buddy system" to monitor each other's pulse rate at the start of each rest period. If the pulse rate exceeds 110 beats per minute, the next work period shall be shortened by one-third without shortening the rest period. The pulse rate shall be monitored again at the beginning of the next rest period, and if the pulse rate exceeds 110 beats per minute, the work period shall again be shortened by one-third. No employee shall be allowed to continue working in PPE if his or her pulse rate exceeds 110 beats per minute continuously.

Table 8 (reprinted from the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*) can be used to establish work/rest periods and the frequency of monitoring pulse rates.

Guidelines for the prevention of cold stress and cold stress threshold limit values (TLVs) shall follow the guidelines stated in EM-381-1-1 Section 06.J and the current edition of *ACGIH Threshold Limit Values for Chemical Substances and Physical Agents* (OSHA 1993). At air temperatures below 45°F, the air temperature shall be monitored. Below

30°F, the temperature and wind speed shall be monitored and the equivalent chill temperature calculated. Clothing requirements are listed in paragraph 06.J.09, Section 06.J of EM 385-1-1.

7.2.7 Carbon Dioxide Monitoring

Carbon dioxide monitoring is not anticipated to be necessary except as noted below. At the Bioremediation Facility, real-time monitoring for carbon dioxide will be performed periodically in the buildings housing the windrows. If levels exceed 4,000 ppm inside of the structure, the structure will be evacuated and action taken to vent the structure and maintain a level below 3,000 ppm.

7.2.8 Percent LEL, Oxygen, and Hydrogen Sulfide Monitoring

A direct-reading real-time combination instrument capable of measuring percent of Lower Explosive Level (LEL), percent of oxygen (O₂), and hydrogen sulfide (H₂S) concentration in parts per million (ppm) will be used whenever excavation and penetration in potentially contaminated areas occurs and during the characterization of debris. Readings will be taken at locations that reflect approximate general work area conditions. Results of the measurements will be documented. If necessary, the level of PPE used by excavation/penetration personnel will be modified. Section 6 describes the level of PPE to be used based on the concentration of organic vapors and gases in the breathing zone of project personnel. The combination gas meter will be response checked according to the manufacturer's instructions prior to use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site.

7.2.9 Ionizing Radiation Monitoring

A portable direct-reading ionizing radiation survey meter with geiger-mueller (GM) probe suitable for detection of beta, gamma, and x-ray radiation will be used during characterization of debris. The meter must display readings in millirem per hour (mR/hr). The GM meter will be response checked according to the manufacturer's instructions prior to use each day, and calibrated by the manufacturer or other qualified personnel yearly. Records of the response check, maintenance, and annual calibration will be maintained on-site. An action level of 1 mR/hr above background is established. If readings greater than 1 mR/hr above background are detected, the immediate area will be secured. The dose rate on the boundary of the secured area must be below 1 mR/hr. Health Physics personnel from NSWC Crane will be notified to investigate the readings.

7.3 AIR SAMPLING

7.3.1 Organic Compounds

Time-integrated air sampling for aromatic hydrocarbons will be performed whenever the real-time monitoring measures concentrations exceeding 5 ppm for organic gases or vapors for more than 5 consecutive minutes. Samples will be taken with personal air sampling pumps from the personal breathing zone. Time-integrated air samples will be collected and analyzed for aromatic hydrocarbons at the SSHO's discretion. The air samples will be collected and analyzed in accordance with NIOSH Method 1501 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Passive dosimeters may be used in place of air sampling pumps. Analysis of all air samples will be performed by an American Industrial Hygiene Association (AIHA) accredited laboratory.

7.3.2 Inorganic Lead

Personal air sampling pumps will be used for time-integrated air sampling for inorganic lead. Sampling will be performed at the SSHO's discretion whenever the potential for lead exposure exists. The air samples will be collected and analyzed for inorganic lead in accordance with NIOSH Method 7082 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first inorganic lead contaminated work area to determine the level of compliance necessary with the OSHA Lead Standard, 29 CFR 1926.62.

7.3.3 Welding/Cutting Fumes

Engineering controls will be used to minimize the potential exposure to welding fumes. In the event engineering controls are not feasible, personal air samples will be collected during welding activities at the discretion of the SSHO. The air samples will be collected and analyzed for metals in accordance with NIOSH Method 0500 or equivalent method. The air sample pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. No samples are anticipated as necessary for welding/cutting fumes.

7.3.4 Asbestos

No samples are anticipated as necessary.

7.3.5 Cadmium

Personal air sampling pumps will be used for time-integrated air sampling for cadmium. Sampling will be performed at the SSHO's discretion whenever the potential for cadmium exposure exists. The air samples will be collected and analyzed for cadmium

in accordance with NIOSH Method 7048 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first cadmium contaminated work area to determine the level of compliance necessary with the OSHA Cadmium Standard, 29 CFR 1926.63.

7.3.6 Inorganic Arsenic

Personal air sampling pumps will be used for time-integrated air sampling for inorganic arsenic. Sampling will be performed at the SSHO's discretion whenever the potential for inorganic arsenic exposure exists. The air samples will be collected and analyzed for cadmium in accordance with OSHA Method ID105 or equivalent method. The air sampling pump will be calibrated before and after sample collection. Analysis of all air samples will be performed by an AIHA-accredited laboratory. Two personal validation samples will be taken in the first inorganic arsenic contaminated work area to determine the level of compliance necessary with the OSHA Inorganic Arsenic Standard, 29 CFR 1926.1118.

7.3.7 Explosives Residues

Time-integrated air sampling for explosives residues will be performed at the SSHO's discretion whenever the potential for airborne explosive residues exposure exists. The air samples will be collected and analyzed for the following contaminants (the analytical method is listed with the contaminant):

<u>Contaminant</u>	<u>Method</u>
1. TNT	1. OSHA #44
2. DNT	2. NIOSH 4(S215)
3. RDX (Cyclonite)	3. OSHA CIM
4. HMX	4. OSHA CIM
5. Tetryl	5. NIOSH 3(S225)
6. DNB	6. OSHA CIM

Two full-shift personal validation samples will be taken in the first work area representing the maximal exposed individual to validate compliance with the established OSHA PELs and the effectiveness of the engineering controls. **Prior to mobilization, the SSHO will discuss a sampling strategy with the analytical laboratory to determine the best combination of filter cassettes and sorbent tubes to effectively analyze more than one contaminant per filter media.**

7.3.8 Biological Hazards

Biological hazards will be present at two areas of the Soils Bioremediation Facility: (1) amendment receipt and processing and (2) in the Compost Building during active composting. After the man-machine interface is better scoped and any lessons learned

from the Army or Navy can be reviewed, the decision to maintain an active sampling program in this area will be made.

Organisms of concern include colostridium spp, coliforms, fecal coliforms, E. Coli, streptococcus fecalis, and salmonella spp.

7.3.9 PCB Hazards

Air monitoring samples for PCBs are not anticipated. However, if soil significantly contaminated with PCB oil is encountered, then two personal samples shall be collected using the maximum exposed individual(s) in accordance with NIOSH Method 5503. The samples will be collected during the follow-on soil removal activities if any person(s) will be within 15 feet of the soil movement.

7.4 AIR MONITORING AND SAMPLING REQUIREMENTS

Air monitoring and sampling requirements are shown in Table 9.

7.5 RECORDKEEPING AND CHAIN OF CUSTODY

Written records of all monitoring will be maintained on-site. Affected employees will be notified of monitoring results representative of their exposure. Chain-of-Custody (COC) Records will be used for industrial hygiene sampling requiring the collection and shipment of a sample to an approved analytical laboratory. A COC Record will be properly completed and accompany all collected samples in accordance with MK Industrial Hygiene Procedures Manual, Procedure 7.0, *Analytical Laboratory Procedures* (MK 1994a). The selected AIHA-accredited industrial hygiene lab will be American Analytical Laboratories, Inc., Akron, Ohio (216-535-1300) or a local laboratory if one is found. Turn-around time is estimated to be 5 to 10 working days.

Workers will be notified of time-integrated sampling results via memo to the designated supervisor. The Navy will receive all sampling records and results as part of the Close-Out Report.

8.0

SAFETY AND HEALTH WORK PRECAUTIONS AND PROCEDURES

Operations shall be conducted safely consistent with the policies and procedures outlined in this SSHP. Personnel shall be restricted to the minimum number necessary to complete the required work as an administrative control to limit personnel exposures to site chemical hazards.

8.1 GENERAL

All project and subcontractor personnel assigned to this project are responsible for following this SSHP, for using safe practices, and for wearing the PPE specified by the SSHP. Project personnel shall report hazards and unsafe conditions and practices to the SSHP. All federal, state, and local occupational health and safety regulations must be complied with by project personnel. Violations of project procedures may include disciplinary measures up to and including termination.

8.2 OPERATIONS SAFETY

Policies, procedures, requirements, and specific rules shall be established, as needed, to ensure the safety of workers during on-site operations.

8.2.1 Safety Meetings

A safety meeting shall be held at project kickoff and before each change in operation. Plan-of-the-Day meetings are required along with Pre- and Post-Entry Briefings. Refer to Sections 4.4, 4.5, 4.16, 4.17, and 8.6.

8.2.2 General Safety Rules and Procedures

General safety rules and procedures include the following:

- Have a 40-pound rated multipurpose dry chemical fire extinguisher, a first aid kit, eyewash station, and spill response equipment (if applicable) available at every controlled work location. Have the Work Zone Maps posted with pertinent information included and all signs posted.
- Avoid driving over dry grass that is higher than the ground clearance of the vehicle. Catalytic converters on the undercarriage of vehicles are sufficiently hot to ignite dry prairie grass. Never allow a vehicle with a warm undercarriage to sit in a stationary location over dry grass or other combustible materials.

- Do not eat, drink, smoke, take medications, chew gum or tobacco, apply cosmetics, or put objects in your mouth while in the exclusion zone or handling samples.
- When on-site or handling samples, thoroughly wash hands and, if necessary, face, before eating or putting anything in your mouth (to avoid hand-to-mouth contamination). A full body shower is required when specified in the SSHP.
- At a minimum, wear hard hats, safety glasses, and steel-toed and steel-shanked boots when inside the work boundaries.
- Remain a safe distance from excavation equipment when not involved in the operation or monitoring activities.
- Do not, under any circumstances, enter or ride-in or on any backhoe bucket, materials hoist, or any other similar device not specifically designed for carrying personnel.
- Remain aware of your own and other's positions with regard to rotating equipment and be extremely careful when assembling, lifting, and carrying items that may cause pinch-point injuries and collisions.
- Be alert to the symptoms of fatigue, heat stress, and cold stress and their effect on the normal caution and judgment of personnel.
- Use explosion-proof sampling equipment and tools when required.
- Use ground fault circuit interrupters (GFCI) with all electrical tools and equipment.
- Stand clear of trenches during excavation. Always approach the excavation from upwind.
- Stand upwind, whenever possible, of excavations and other sites where the soil has been disturbed.
- Be alert to potentially changing exposure conditions as evidence by perceptible odors, unusual appearance of excavated soils, oily sheen on water, or other evidence of possible contamination.
- Do not enter any excavation or trench greater than 5 feet in depth unless authorized by a competent person.
- Keep tools and equipment off the ground, whenever possible, to avoid tripping hazards and the spread of contamination.

- Always use the buddy system while operating in the site.
- Use the buddy system for all manual lifting.
- Minimize disturbance of all stabilized sites and areas beyond the work area boundaries.
- Cease all work operations on the site at sunset unless the work zones are adequately illuminated with artificial lighting.
- Attend the Plan-of-the-Day Meeting before the start of the work along with the Pre- and Post-Entry Briefings. All team personnel are required to attend.
- Avoid direct contact with contaminated materials unless necessary for sample collection or required observation. PPE shall be worn at all times, as required.
- Do not handle contaminated soil, waste samples, or any other potentially contaminated items unless wearing chemical resistant gloves.
- Remove disposable clothing properly and follow decontamination procedures.
- Always use an appropriate level of PPE as assigned in the site-specific procedures. Lesser levels of protection can result in otherwise preventable exposure. Excessive levels of safety equipment can impair efficiency and increase the potential for accidents.
- Maintain a high level of awareness of the limitations in mobility, dexterity, and visual impairment inherent in the use of Level B and Level C PPE.
- Establish prearranged hand signals or other means of emergency communication when wearing respiratory equipment, because this equipment seriously impairs speech communication.
- Wear hearing protection if you have to shout to communicate at a distance of 3 feet in steady-state (continuous) noise or when you expect loud impact noise from certain activities.

8.3 WORK SITE PRACTICES

No worker may engage in any activity for which the health and safety consequences of their actions are unclear (for example, previously unplanned work) without the approval of the SSHO. If such activities become necessary to complete any phase of the work, a project instruction or procedure shall be developed and followed.

8.4 HAZARD COMMUNICATION

Each subcontractor shall have a written Hazard Communication Program in accordance with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and applicable State Department of Health Regulations. Employers shall ensure that other employer(s) are notified of workplace hazards where the latter employers may come in contact with these hazards. Material Safety Data Sheets (MSDS) for all hazardous materials in the work area shall be readily available for employees to review. Refer to Section 4.8 for training requirement.

8.5 EXCAVATIONS

Excavations shall be conducted in accordance with OSHA's Excavation Standard, 1926 Subpart P, and EM 385-1-1, October 1992, Section 25. A competent person must inspect and approve an excavation for personnel entry before each work shift or more often as conditions change. Refer to Section 2.4.4 for more details.

8.6 PRE-ENTRY BRIEFINGS

Before initial entry into a CRZ or EZ, personnel must attend a Pre-Entry Briefing which reviews the requirements of this SSHP and site-specific requirements. A record of attendance at this briefing shall be maintained on the form shown as Figure 4. Additional Pre-Entry Briefings and safety meetings will be conducted if conditions change. The Pre-Entry Briefings are conducted by Subcontractor Supervisors. See Section 4.17 for training requirement.

Note: Attendance at Post-Entry Briefings is not required to be separately documented. A log entry is satisfactory. Safety Meetings, Pre-Entry Briefings and Tool Box Safety Meetings are required to be formally documented using Figure 4 or equivalent.

8.7 WORK SITE CONTROL

During work activities, and during non-work periods as warranted, personnel responsible for the work shall maintain control of the work area. No unauthorized personnel shall be allowed to enter the work areas unless they meet the requirements of this SSHP and obtain the approval of the SSHO. Violations of the work control must be reported immediately to the SSHO.

9.0 WORK ZONES

Where a potential exists for worker exposure to hazardous substances, safety, or health hazards, work zones will be established, and the flow of personnel and equipment will be controlled. The establishment of work zones will ensure that personnel are properly protected against hazards present in the work area, work activities and contamination are confined to the appropriate areas, and personnel can be located and evacuated in an emergency.

Before the commencement of field activities, work zones will be established by the Subcontractor Superintendent with the approval of SSHO as necessary to meet operational and safety objectives. These work zones will be depicted on maps that are field prepared. The maps will be posted by the Subcontractor Superintendent near the entrance to the work area. In addition to the zones, these maps should show assembly points, evacuation routes, location of first aid equipment and fire extinguisher, and emergency communications equipment. One copy of the Work Zone Maps and all revisions will be retained by the SSHO to include in Appendix B of this SSHP.

9.1 EXCLUSION ZONE

The exclusion zone (EZ) is the area where hazardous substances are present or expected to occur, or health and safety hazards are present. Entry into this area is limited to personnel required to perform the work who are wearing the specified PPE and have attended a Pre-Entry Briefing. Everyone entering the EZ shall have completed the required health and safety training and will participate in the medical surveillance program as necessary. The boundary of the EZ will be determined for each activity and may change depending on activities and conditions.

An EZ will be established to encompass the contaminated area. For this project, the EZ for each soil excavation area will consist of the immediate area of excavation extending outward for approximately 20 feet. The EZ will include the excavated soil classified as potentially contaminated that may be stockpiled.

The EZ will be clearly delineated with signs, barricade tape, fences, or other suitable means. Access control points will be established to regulate the flow of personnel and equipment in an out of the zone and to help verify that proper procedures for entry and exit are followed. PPE levels in the EZ (refer to Section 7) are initially scoped as Level C, depending on the task listed in Table 6. Decontamination will follow guidelines established in Section 10. Gross contamination will be removed in the EZ followed by additional decontamination in the CRZ as discussed in Section 7.0 of the Work Plan. The SSHO will monitor activities in the EZ from his position in the CRZ. The boundary line from the EZ to the CRZ will be based on the following criteria:

1. Approximately 20 feet outward from contaminated work area, or as much as necessary, to include the heavy equipment operating in the zone and the temporary staging of any potentially contaminated soil.
2. Perimeter air monitoring for VOCs reads no increase in ppm-equivalents above background and the portable dust/aerosol monitor shows no increase in concentration above background. Background is considered the Support Zone (SZ) area.

9.2 CONTAMINATION REDUCTION ZONE

The Contamination Reduction Zone (CRZ) is the transition area between the contaminated area (the EZ) and the clean area (the SZ). While designed primarily to reduce the possibility of the support zone becoming contaminated or affected by EZ activities, the CRZ is also used for decontamination of personnel and equipment. No personnel or equipment will be allowed to exit the EZ or CRZ without being properly decontaminated, except in emergencies. The CRZ is designated as the immediate area around the EZ, extending outward approximately 20 feet or as much as necessary, to accommodate the complete length of the longest piece of heavy equipment. Additionally, the immediate area extending outward for approximately 10 feet from the decontamination facility will be designated as the CRZ. The decontamination facility is discussed in Section 7.2 of the Work Plan.

Used PPE will be removed and stored in properly marked 55-gallon drums or other containers for disposal. Work clothing will also be removed and stored in lockers. Personnel washing and shower facilities will be provided as necessary. Construction and field equipment will be decontaminated following Work Plan Section 7.4; soil sampling equipment will be decontaminated in accordance with the SAP.

9.3 SUPPORT ZONE

The support zone (SZ) consists of all areas outside the exclusion and contamination reduction zones, but within the project site. The SZ is used for all site activities that are not limited to the EZ or CRZ equipment and material storage, offices, parking, etc. Logs will be maintained of the Pre-Entry Briefing in the SZ to record the names, companies, and reason for entry into the CRZ or EZ. The SZ will also serve as the staging area for all activities.

9.4 CONSTRUCTION ZONE

The soils construction zone consists of all areas within the immediate construction area of the Bioremediation Facility. This area represents all new clean construction work.

9.5 WORK ZONE CONTROLS

Before site operations begin, the SZ control point will be identified with signs stating that all visitors are required to stop and inform site personnel of their presence on the work site.

Entrances to the CRZ and EZ will be conspicuously posted with signs stating the following:

HAZARDOUS AREA KEEP OUT
DANGER
AUTHORIZED PERSONNEL ONLY
PERSONAL PROTECTIVE EQUIPMENT IS REQUIRED IN THIS AREA

Post signs at the entrance to the CRZ before operations begin, stating:

NO SMOKING, DRINKING, OR EATING BEYOND THIS POINT

The following requirements will apply to all personnel entering the CRZ or EZ:

- The use of the buddy system is mandatory. No one will be allowed to work alone in the CRZ or EZ without permission from the SSHO.
- No smoking, eating, drinking, chewing tobacco or gum, or application of cosmetics within the CRZ or EZ.

The following traffic rules will apply to all motorized vehicles and equipment while on-site:

- Equipment carrying waste shall always have the right-of-way, except for emergency vehicles.
- The speed limit is 10 mph, or as posted. Exceeding the speed limit is cause for disciplinary action, including termination of employment.
- Personnel will not ride equipment that has not been specifically designed for the transport of personnel.

Entrances to the Soils Bioremediation Facility Construction Zone will be conspicuously posted with signs stating the following:

CONSTRUCTION AREA KEEP OUT
DANGER
AUTHORIZED PERSONNEL ONLY

10.0 PERSONNEL AND EQUIPMENT DECONTAMINATION AND HYGIENE PROCEDURES

All personnel, clothing and equipment leaving an EZ shall be inspected and, if necessary, decontaminated to remove any potentially harmful substances that may have adhered to them. Some equipment/clothing may be disposed of rather than decontaminated. In this case, the used PPE and/or equipment (such as disposable sampling equipment) will be stored in properly marked, plastic-lined 55-gallon drums in the CRZ, followed by transport to a local landfill. A Decontamination Facility will be constructed for personnel and equipment decontamination (refer to Section 7.2 in the Work Plan). Refer also to Work Plan Section 7.3 for personnel decontamination, Section 7.4 for equipment decontamination, and Section 7.5 for sampling equipment decontamination. This section gives guidelines for performing the decontamination procedures. Final details will be described during the site-specific safety and health briefing prior to commencing field operations when all equipment is procured, tested, and in place.

10.1 PERSONNEL DECONTAMINATION

Decontamination (decon) stations will be established in the CRZ. The decon stations will consist of the following, as appropriate:

- Equipment drop.
- Portable High-Energy Particulate Air (HEPA) vacuum for vacuuming PPE before removal.
- Boot wash station consisting of a boot pick for mud removal, a tub of water, detergent with brushes for cleaning, and another tub of water for rinsing.
- Glove wash station similar to boot wash station.
- Sampling equipment wash station (similar to boot wash station).
- Disposable clothing drop and work clothing drop. All contaminated or potentially contaminated disposable clothing shall be placed into labeled 6-mil plastic bags for disposal as contaminated waste. Work clothing will be required to be placed into labeled 6-mil plastic bags for laundry servicing if potentially contaminated as a result of ripped or torn disposable clothing or other abnormal conditions.

- Personal showers and washing facilities will consist of water, towels, and soap. Street clothing shall be stored in lockers provided in the personnel decon facility "clean side."

10.2 EQUIPMENT DECONTAMINATION

All equipment and tools used in the EZ will be inspected for contamination before removal from the EZ. Any equipment and tool with visible contamination will be cleaned before removal from the EZ. A water and detergent solution will be used for highly contaminated equipment, followed by a high-pressure hot water rinse, if necessary. All water used during decontamination will be contained for treatment and/or disposal. Some construction and field equipment will be decontaminated at the temporary decontamination facility. After gross contamination is removed, affected surfaces of the equipment will be wrapped in plastic and transported.

10.3 WASHING FACILITIES

A washing facility may or may not be available in the SZ. The washing facility will consist of water, soap, and towels for personnel, as necessary. If a washing facility is not available, SZ personnel will be allowed to use the washing facilities in the CRZ.

During construction of the Soils Bioremediation Facility, a washing facility shall be set up near the Construction Zone.

10.4 DECONTAMINATION WASH WATER

Personnel decon stations, equipment decon areas, and washing facilities will be designed to collect all wash and rinse waters into 55-gallon drums or a larger temporary storage container. The tank, if used, will be of sufficient volume to allow for collection and temporary storage of decontamination water and rinse water from the CRZ and vehicle decontamination. Decontamination water will be disposed of via the on-site sewage treatment facility or shipped off-site for disposal.

10.5 PERSONAL HYGIENE

Eating, drinking, and the use of tobacco or cosmetic products are prohibited in the CRZ and EZ. Personnel exiting the work areas are required to thoroughly wash their hands and face before eating, drinking, smoking, or using toilet facilities. End-of-work-shift showers may be required with change to street clothes. Adequate toilet and lunchroom facilities free of contaminants must be made available.

11.0 ON-SITE FIRST AID AND EQUIPMENT

This section describes first-aid and equipment requirements.

11.1 FIRST-AID AND CPR TRAINING

At least two employees on each shift shall be certified to administer first aid and CPR. Individuals required to work alone in remote areas shall be trained in first aid. At a minimum, the SSHO will be first-aid and CPR certified. Each subcontractor must have at least one first-aid and CPR certified individual on-site when the subcontractor is at work.

11.2 FIRST AID AND MEDICAL FACILITY REQUIREMENTS

A 16-unit first-aid kit, at a minimum, shall be maintained at the work site. The location of the first aid kit shall be communicated to project personnel as part of the Pre-Entry Briefing and site-specific training. Included with the first-aid kit shall be a CPR kit for control of biohazards. A separate eyewash kit shall also be available at each work station. The phone numbers and locations of emergency contacts and medical facilities shall be posted in the office trailers and at entry to the control zones. The Work Zone Map must also be posted at each controlled work area. The locations and phone numbers of emergency contacts for each facility are listed in Table 3.

11.3 REPORT OF FIRST AID CASES

All first aid cases, accidents, and incidents shall be promptly reported to the SSHO. The SSHO shall immediately notify the NSWC Site Representative of all injuries, even if only preliminary information is available.

The MK Project Management Office (PMO) should be notified shortly after notification to the NSWC Site Representative. If the NSWC Site Representative cannot be reached, the PMO still should be promptly notified.

A written report of the injury must be provided to the NSWC Site Representative and PMO within 24 hours of the incident. This report is to include:

1. Employers' First Report of Injury (Workman's Compensation Insurance Form)
2. Supervisor's Accident Investigation Report (MK Form CAS 24/77)
3. Accident Data Report (MK Form 6783/91).

4. Any records provided by the Medical Service Provider such as (1) Hospital Emergency Room Reports, (2) Examining Physician's designation of work restriction, and (3) Examining Physician's Work Release.

12.0

EMERGENCY RESPONSE PLAN AND CONTINGENCY PROCEDURES

This section describes a contingency plan to be implemented in the event of injuries, illnesses, accidents, and fires. The contingency plan provides guidelines for the proper response to emergencies, but the actual response will depend on the situation.

12.1 GENERAL

In the event of an emergency, the SSHO will direct all personnel to take appropriate action which could include any or all of the following:

- Evacuate the work zone to a safe place of refuge.
- Notify emergency services as identified in Table 3.
- Initiate emergency response action and notify emergency services.

12.2 PRE-EMERGENCY PLANNING

During mobilization activities for this project, the PM, Project Superintendents and the SSHO shall review the NAVFAC SouthDiv Emergency Response Procedure PHSP 002.1. Following review, they shall execute the steps necessary to ensure effective emergency response requirements and resources are established for this project.

In addition to the guidance provided in this document, emergency response preplanning specific to each task and work site will be included in the project kickoff meeting, any task-specific safety meetings, Pre-Entry Briefings, and construction tool box meetings. This training will include:

- **Assembly Points.** If the work activity may result in a release of hazardous substances, more than one assembly point will be specified to ensure that at least one upwind assembly point is accessible. This also pertains to fires and sites subject to adverse weather conditions. Information must be included on the Work Zone Maps.
- **Emergency Response Coordinator.** The SSHO, as the on-site emergency response coordinator, will contact the emergency response providers, account for individuals at the assembly point, and plan the appropriate response.
- **Evacuation Routes.** Routes will be specified as needed. Information must be included on the Work Zone Maps.
- **Means of Evacuation.** The number of personnel that may be evacuated from the work site by various routes will be evaluated by the SSHO.

- Means of Communication. This will include the means of alerting personnel to an emergency at all points in the work site. Communication procedures should consider the sound screening potential of hearing protection, distance, and noisy equipment when specifying the use of alarms, horns and sirens. The means of communication with emergency response providers will be considered. Information must be included on the Work Zone Maps.
- Designation of a location for first aid services, fire extinguisher(s) and spill control equipment. Information must be included on the Work Zone Maps.
- Procedures to be followed by employees who remain to operate critical operations to ensure safe shutdown.

Emergency response providers (ambulance, fire, police) will be informed of their responsibilities under this SSHP by the SSHO. Providers will be given advance information, as necessary, to enable them to respond to an emergency expeditiously, while minimizing risk to themselves.

12.3 RESPONSIBILITIES

Following is a description of personnel roles, lines of authority, and the emergency response communication/notification responsibilities for site personnel.

12.3.1 Site Personnel

All site personnel are responsible for recognizing conditions that have the potential for resulting in a personal injury or damage to property and to report the condition immediately to their supervisor or the SSHO.

12.3.2 Project Manager

The Project Manager is responsible for ensuring adherence to the administrative elements and achievement of the Emergency Response Plan, as referenced in this document. He will evaluate the site's preparedness for emergency responses, identify special conditions that may require additional preparations, and ensure that necessary equipment and facilities are provided to support this plan.

12.3.3 Certified Industrial Hygienist

The Certified Industrial Hygienist (CIH) is responsible for preparing the Emergency Response Plan (typically this section of the SSHP). The CIH will develop and review the Emergency Response Plan, evacuation plans, and oversee implementation at the site. The CIH will ensure that supervisors and employees meet the training requirements of the plan and approve the equipment used in the plan. The CIH may designate on-site duties to the SSHO.

12.3.4 Site Safety and Health Officer

The SSHO is responsible for directing response actions in emergencies. The SSHO coordinate with project management to ensure the availability of response equipment and supplies and will initiate drills. The SSHO will evaluate emergency response plans over the course of the project to keep them up-to-date and to ensure that they are applicable and relevant to emergency response organizations.

12.3.5 Subcontractors

All subcontractor personnel will comply with the provisions of this plan and participate in training as required to implement response procedures. All personnel will be aware of their work areas and notify supervisors of hazards at the site.

12.4 EMERGENCY RECOGNITION AND PREVENTION

Site personnel shall be informed of hazards and life-threatening emergencies during site-specific training to include the project kickoff meeting, safety meetings, and Pre-Entry Briefings. Means to control hazards and mitigate emergencies will be addressed then.

12.5 SAFETY ZONES

Suitable assembly points will be established at the start of the project by the SSHO to provide a safe point of refuge for site personnel. Additional information concerning other potential site hazards will be provided in the site briefing. Safety Zones or assembly points must be included on the Work Zone Maps.

12.6 SITE SECURITY AND CONTROL

Base personnel shall always be informed of any emergency, and only authorized personnel shall be allowed into the area. As necessary, areas may be cordoned off and access restricted.

12.7 EVACUATION ROUTES

Evacuation routes will be established based on scope of work, location of work, and atmospheric conditions. Evacuation routes shall be posted in various locations on the site, if necessary, and included on the Work Zone Maps. All site personnel will be informed of evacuation procedures during site-specific training, and Pre-Entry Briefings.

12.8 EMERGENCY DECONTAMINATION

In the event an employee is injured or becomes ill and requires hospital treatment, the extent of decontamination depends on the severity of the injury or illness and the time

delay that decontamination may cause. If the employee has any signs of contamination, the ambulance and hospital staff will be informed of this and the nature of the contamination. The NSWCR Crane Fire Department can provide gross decontamination before treatment and transport by the Ambulance Service. Reasonable effort will be expended to decontaminate the victim prior to removal from the site. The medical facilities will be informed of the intended scope of work and the potential for contaminated personnel. The medical facilities will receive copies of all the MSDSs and/or NIOSH Pocket Guides applicable to this project. The SSHO will visit each medical facility and provide the necessary information.

12.9 EMERGENCY MEDICAL TREATMENT AND FIRST AID

See Section 11.0 of this plan.

12.10 COMMUNICATIONS

The SSHO and the Construction Superintendent(s) shall be equipped with two-way radios for on-site communications, as warranted. Cellular telephones, if necessary, will be used for additional communications with outside emergency services. In the event of an emergency, all communications except those related to emergency response will cease. The job supervisor(s), with concurrence from the SSHO, will establish the requirements and communication protocols for radios and/or cellular telephones.

12.11 CRITIQUE OF RESPONSE AND FOLLOW-UP

All drills, exercises, and actual emergencies shall be critiqued, and follow-up corrective actions shall be implemented, as needed.

12.12 PPE AND EMERGENCY EQUIPMENT

Site personnel performing a rescue or responding to a spill must have an understanding of the potential hazards involved and wear the appropriate PPE.

Portable fire extinguishers will be used for fire protection in all work and storage areas. Portable fire extinguishers using dry chemical materials must be used in areas where flammable/combustible liquids or gases are stored or used. Portable emergency eyewash kits shall be available at each work site. Where necessary, emergency containment equipment for spills shall be available at each work site.

12.13 SITE TOPOGRAPHY, LAYOUT AND PREVAILING WIND CONDITIONS

Topography, layout, and prevailing wind conditions shall be considered in establishing evacuation routes and assembly points.

12.14 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS

All emergencies will be promptly reported to the Emergency Response Number (X3300), the Environmental Department (X1132, X3114, or X6160), and to the SSHO. The SSHO will ensure that the NSWSC Site Representative is notified promptly and will direct initial emergency response actions until the arrival of the NSWSC Site Representative. The NSWSC Site Representative can include the officer in charge of security, fire department and/or ambulance services, or the Environmental Protection Department Manager or designee.

The following initial response actions are to be taken by MK personnel and subcontractors at the work site for various types of incidents.

A. Incident Type: Fires in Vehicles and Mobile Equipment, Process Equipment, and Support Structures.

Response Actions:

1. Notify the NSWSC Crane Security Desk at extension 3300, and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and any potential material release.
2. SSHO or PM designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. SSHO or PM assumes initial command of the situation and directs personnel to do one of the following:
 - a. Emergency shutdown of process equipment or mobile equipment, evacuate the work zone or immediate area to a safe place of refuge, meet the incoming response units and provide all available information.
 - b. Initiate first fire attack and knockdown using available fire extinguishing equipment followed by evacuating the work zone or immediate area.

B. Incident Type: Preparation for Adverse Weather Condition to Include High Winds, Tornado, Heavy Rains, Snow and Ice Conditions.

Response Actions:

1. SSHO or PM notifies the NSWC Crane Security Desk at extension 3300 and provides the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of the work site(s).
 - c. Preparation for adverse weather condition has begun.
 - d. Permanent structure location where personnel will be relocating to on Base.
2. SSHO or PM will direct personnel to shutdown operations, secure loose materials, and park and secure mobile equipment. Personnel shall be directed to report to a permanent building after completing decontamination procedures.
3. SSHO or PM will complete accountability and await clearance from Base Security to resume operations or other action.

C. Incident Type: Medical and Rescue Emergencies.

Response Actions:

1. Notify the NSWC Crane Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and any exposure to hazardous material.
2. SSHO or PM designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. SSHO or PM assumes initial command of the situation and completes or directs personnel to do one or both of the following:
 - a. Emergency shutdown of process equipment or mobile equipment and any other necessary action to mitigate or control the incident.
 - b. Initiate emergency first aid actions until arrival of emergency units.

D. Incident Type: Spills or Releases of Hazardous Material

Response will be conducted according to NAVSURFWARCENDIVINST 5090.5, Base Oil and Hazardous Substance Spill Contingency Plan.

Response Actions:

1. Notify the NSWCRANE Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and estimate of material released.
2. SSHO or PM designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. SSHO or PM assumes initial command of the situation and directs personnel to do one of the following:
 - a. Emergency shutdown of process equipment or mobile equipment, evacuate the work zone or immediate area to a safe place of refuge, meet the incoming response units and provide all available information.
 - b. Initiate first spill response using available spill response equipment only for small operational spills which personnel are trained to mitigate. Evacuate the work zone or immediate area if there are any health threats or risks to personnel.

E. Incident Type: Mobile vehicle accident or incident during transport from work area to Bioremediation Facility.

Response Actions:

1. Notify the NSWCRANE Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and estimate of material released.

2. SSHO or PM designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. SSHO or PM assumes initial command of the situation and directs personnel to do the following:
 - a. Cordon off the accident/spill area.
 - b. Cover the spilled contaminated soils with canvas tarps or visqueen.
 - c. Install temporary Environmental Protection and/or Erosion Control measures to contain potential surface run-off contamination.

13.0 LOGS, REPORTS, AND RECORDKEEPING

13.1 SAFETY AND HEALTH LOGBOOK

The SSHO shall maintain a Project Safety and Health Logbook for the duration of site work activities. Information will be recorded daily on the form shown as Figure 6. The logbook will contain the following information:

- General weather conditions including approximate wind speed and direction, temperature, precipitation, and amount of sun.
- Monitoring/sampling conducted for the day, with results, as appropriate.
- Instrumentation used.
- Level of protection and any special considerations.
- Any problems or unusual situations during the day.
- Activities conducted throughout the day.
- Documentation of any correspondence.
- Number of employees in each area.
- SSHO's signature and date.

Additional records to be kept will include calibration data, instrument serial numbers, modifications to established safety and health procedures, and daily safety inspections. Visitors will be registered before entering the site. Records of training, site orientations, and briefings (including pre-entry) will be maintained.

13.2 REPORTS

A daily site safety and health inspection report shall be prepared by the SSHO. This report shall identify work activities, safety and health-related deficiencies, and corrective measures. At a minimum the checklist shown in Figure 7 shall be completed by the SSHO. Additional industrial hygiene and safety forms will be used, as necessary, such as forms to record instrument calibrations, monitoring results, and air sampling data. All incidents that result in property damage, personnel injuries, or illness will be investigated and notification/reporting requirements met in accordance with standard MK policy and procedure.

13.3 RECORDKEEPING

The SSHO shall maintain records of all injuries and illnesses for MK employees only incidental to the work following 29 CFR 1904, including copies of the Worker's Compensation First Report of Injury. The SSHO shall maintain records of all injuries and illnesses of subcontractors incidental to the work, including copies of the Worker's Compensation First Report of Injury. These records will be maintained on the OSHA 200 Log, or equivalent, and will include the number of exposure workhours documented on a MK Monthly Project Safety Report form. A record of all first aid treatments, not otherwise recordable, shall be maintained and furnished to the NSWC Site Representative upon request. The SSHO shall maintain records of employee exposure to potentially harmful toxic materials, harmful physical agents, and medical records in accordance with 29 CFR 1910.120. Workers will be notified of time-integrated sampling results via memo to the designated supervisor. The Navy will receive all sampling records and results as part of the Close-Out Report.

14.0 ON-SITE WORK PLANS

A site-specific Work Plan was developed to define the work tasks and identify the work objectives. The means and personnel required to complete the task are identified along with consideration for methods, logistics, quality control/quality assurance, and resources. This SSHP is a supplement to the Work Plan.

15.0 COMMUNICATION PROCEDURES

This section describes communication procedures and equipment.

15.1 RADIO COMMUNICATION

The SSHO and construction supervisors shall be equipped with two-way radios for on-site communications, as warranted by the number and proximity of work sites. Two-way radios will not be available from the base. MK will lease radios per requirements specified by the Security Chief. The SSHO will obtain information on radio unit designation and communication protocols and brief the construction supervisors. In certain areas, two-way radio communication is restricted due to explosive operations.

15.2 TELEPHONE

If not restricted by explosive operations, a cellular telephone shall be available for emergency communications if no other telephone is readily available. At each job location, the Supervisor is responsible for verifying the location of the nearest telephone and informing the workers at the Pre-Entry Briefing.

15.3 EMERGENCY ALARM

An emergency alarm, such as an air horn, shall be available at each major work site to warn personnel of an emergency. Personnel shall be trained on actions they are to take if the alarm is sounded to include evacuation routes and assembly points. During this project, use of audible alarm may not be necessary and voice contact should be sufficient for emergency annunciation. The SSHO will make this decision. The buddy system shall be used always while operating at this project. The job supervisor along with the SSHO shall establish prearranged hand signals, as a backup to voice communications, in cases such as wearing respirator equipment and confined space entry.

15.4 DRILLS AND EXERCISES

Drills and exercises shall be conducted to ensure that communication methods are adequate. The SSHO will test the two-way communication to confirm emergency communication using NSWC Crane recommended protocols. No field exercises are planned at this time.

16.0 SPILL CONTAINMENT PLAN

Spill and release accident scenarios during interim measures cleanup could occur and may involve residue process material and rinsates from decontamination activities. The information in this section will be used by project personnel to respond to and mitigate any releases on the project site.

16.1 GENERAL

In case of a spill or release, the SSHO will order all personnel to take appropriate action which could include any or all of the following:

- Evacuate the work zone to a safe place of refuge.
- Notify emergency services as identified in Table 3.
- Initiate spill response action and notify emergency services.

16.2 PREPLANNING FOR SPILL CONTROL

Construction activities and, most importantly, operational activities will be reviewed for release potential and the capability of on-site personnel to adequately respond. Base personnel will be contacted to determine their capability to respond to various releases. All aspects of the Emergency Response Plan, as described in Section 12.0, will be reviewed by site personnel to ensure adequacy and that resources are available.

During mobilization activities for this project, the PM, Project Superintendents and the SSHO shall review the NAVFAC SouthDiv Spill Response Procedure PHSP 003.1 and the Base Oil and Hazardous Substances Spill Contingency Plan. After review, they shall execute the steps necessary to ensure that effective spill response planning requirements and resources are established for this project.

MK will cooperate with the Base and if necessary, other site contractors, and federal, state, and local directors of emergency preparedness and response. This cooperation will ensure a coordinated effort in preparing for a spill emergency with response plans that are compatible and integrated. Prior to starting work, MK will review PHSP.003.1, meet with site representatives on spill control, and ensure the SSHP is consistent with site requirements for spill control. Specific roles and responsibilities will be developed for MK and Navy personnel. It is anticipated that the Base Fire Department will be notified of any spills. They will help in spill containment. The Base Response Team will provide overall command and control of the cleanup activity.

In addition to the guidance provided in this document, the project kickoff meeting, any task-specific safety meetings, and Pre-Entry Briefings will include spill response and

emergency response preplanning specific to each task and work site. This training will include:

- **Assembly Points.** If the work activity may result in a release of hazardous substances, more than one assembly point will be specified to ensure that at least one upwind assembly point is accessible. This also pertains to fires and sites subject to adverse weather conditions. Information must be included on the Work Zone Maps.
- **Emergency Response Coordinator.** The SSHO, as the on-site emergency response coordinator, will contact the emergency response providers, account for individuals at the assembly point, and plan the appropriate response.
- **Evacuation Routes.** Routes will be specified as needed. Information must be included on the Work Zone Maps.
- **Means of Evacuation.** The number of personnel that may be evacuated from the work site by various routes will be evaluated by the SSHO.
- **Means of Communication.** This will include the means of alerting personnel to an emergency at all points in the work site. The means should consider the sound screening potential of hearing protection, distance, and noisy equipment when specifying the use of alarms, horns and sirens. The means of communication with emergency response providers will be considered. Information must be included on the Work Zone Maps.
- **Designation of a location** for first aid services, fire extinguisher(s) and spill control equipment. Information must be included on the Work Zone Maps.
- **Procedures** to be followed by employees who remain to operate critical operations to ensure safe shutdown.

Emergency response providers (ambulance, fire, police) will be informed of their responsibilities under this SSHP by the SSHO. The provider will be given advance information, as necessary, to enable them to respond to an emergency expeditiously, while minimizing risk to themselves.

16.3 SPILL AND FIRE CONTROL MATERIALS AND EQUIPMENT

Before moving or handling drums or containers that contain hazardous materials, DOT-approved salvage drums or containers will be available. In addition, suitable quantities of proper absorbent materials, neutralizing agents, and fire suppression equipment will be kept available in areas where spills, leaks, or ruptures may occur.

Drums and containers used during a cleanup will be appropriate to the hazardous substances they are meant to contain and will meet the regulations promulgated by DOT, 49 CFR Parts 171-179; OSHA, 29 CFR 1910.120; and EPA, 40 CFR 262. Drums and containers will be inspected for defects and their integrity ensured prior to being filled with any nonsolid hazardous substance.

A material spill can be contained with porous or absorbent barriers. Absorbent materials can take several forms (pillows, sheets, brooms, loose chips, particle beads, and fibers) that may be set in place, or scattered by hand or blower. Preferred sorbents are inert nonreactive clay minerals (neutralizing agents may be added) or specific formulations that provide automatic neutralization or vapor control.

16.4 SPILL CONTROL MEASURES

Stopping the leak or spill at its source may involve turning off pumps or closing valves. Returning a container to an upright position, transferring wastes to other containers, or moving containers to a less dangerous location may, in some circumstances, be possible but should not be attempted if there is the potential for a skin contact exposure to an unknown or caustic/skin absorbent chemical. Similarly, the patching of an active leak is not advised until a careful evaluation of the operation can be made and the necessary PPE and rescue equipment readied.

16.5 DRUM, CONTAINER, AND TANK HANDLING AND MOVING PROCEDURES

Drums, containers, and/or tanks of hazardous or flammable substances will not be moved until the requirements for preparations as described in the Work Plan and SSHP have been completed. All required equipment and materials must be at the work site ready for use. In addition, the employees need to be familiar with their responsibilities, the emergency response procedures, and the potential hazards associated with the contents of the drums and containers.

Work site operations will be organized to minimize drum or container movement. Each drum or container will be inspected before they are moved to ensure that they can be picked up without suffering a rupture or puncture, and relocated without having the contents spill or leak.

Unlabeled drums and containers will be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Drums and containers under pressure, as evidence by bulging or swelling, will not be moved until the cause for excess pressure is determined. Appropriate containment procedures will be implemented to protect employees from explosion.

Equipment used to handle the drums and containers will be selected, positioned, operated, and maintained to minimize any contact that could rupture, puncture, dent, or drop drums and containers holding hazardous substances.

Equipment used to handle the drums and containers will be selected, positioned, and operated to minimize the potential for equipment ignition sources to ignite vapors released from ruptured drums or containers. Drums and containers that cannot be moved without rupture, leakage, or spillage will be emptied into a sound container using a device specified for the material being transferred.

16.6 INITIAL REPORTING AND MANAGEMENT OF INCIDENTS

All emergencies will be promptly reported to the on-site Emergency Response Number (X3300), the Environmental Protection Department (X1132, C3114, or X6160), and to the SSHO. The SSHO will ensure that the NSWC Site Representative is notified promptly and will direct initial emergency response actions until the arrival of the NSWC Site Representative. The NSWC Site Representative can include the officer in charge of security, fire department and/or ambulance services, or the Environmental Protection Department Manager or designee.

Initial response actions to be taken by MK personnel and subcontractors at the work site for spill and release emergencies are as follows:

A. Incident Type: Spills or Releases of Hazardous Material

Response Actions:

1. Notify the NSWC Crane Security Desk at extension 3300 and provide the following information:
 - a. The name and phone number of the person making the person call.
 - b. The location of incident.
 - c. The type of incident.
 - d. Injured or trapped personnel and estimate of material released.
2. SSHO or PM designates one person to meet the emergency response units at the nearest road where the units will be approaching.
3. SSHO or PM assumes initial command of the situation and directs personnel to do one of the following:
 - a. Emergency shutdown of process equipment or mobile equipment, evacuate the work zone or immediate area to a safe place of refuge, and meet the incoming response units and provide all available information.
 - b. Initiate first spill response using available spill response equipment only for small operational spills where personnel are trained to mitigate. Evacuate the work zone or immediate area if there are any health threats or risks to personnel.

17.0
CONFINED SPACES

Permit-required confined space entry is not anticipated on this project. If entry is required in an excavation that is greater than 5 feet in depth, the excavation must be treated initially as a permit-required confined space. Atmospheric monitoring must be completed before the excavation can be downgraded to nonpermit-required confined space. Engineering controls must be in place to safeguard the excavation from collapse. Any confined space entry must follow MK Procedure 9.0 found in the Industrial Hygiene Procedures Manual (MK 1994a).

TABLES

**Table 1
Site Description and Contaminants**

Identifier	Location/Description	Scope of Work	Contaminants
SWMU 03/10	Ammunition Burning Ground (ABG), eastern portion of NSWC, see Figure 2 in Work Plan.	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Residues of 2,4 DNT, 2,6 DNT, TNT, Tetryl, DNB, RDX, HMX, antimony, cadmium, chromium, copper, and lead in soils.
SWMU 10/15	Rockeye, north central portion of NSWC, see Figure 2 in Work Plan.	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Residues of TNT, HMX and RDX in soils. Low levels of metals, cyanide, methylene chloride and PCBs.
SWMU 13/14	Mine Fill B, east of SWMU 12/14, see Figure 2 in Work Plan.	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Residues of TNT, HMX, RDX, 2,4 DNT, TNB, antimony, beryllium, arsenic, cadmium, chromium, lead, copper, nickel, zinc, barium, aluminum, cobalt, iron, magnesium.
SWMU 12/14	Mine Fill A, west central portion of NSWC, see Figure 2 in Work Plan.	Soil excavation and transport to Bioremediation Facility, site restoration, and soil sampling.	Residues of TNT, HMX and RDX in soils. Also PCB contamination in soils, Aroclor 1242, 1254, and 1260.
Bioremediation Facility	To be located east of Bunker 828 off H-280 in the east central area of NSWC, see Figure 2 in Work Plan.	Soil excavated from SWMU 03/10, 10/15, 12/14, and 12/13 will be processed at this facility using composting technology.	Contaminants in Soil to be processed at this facility are listed in Section 1.3. Amendments for mixing with soil may include wood material, manure, and vegetable wastes.

**Table 2
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Arsenic	Metal: silver gray or tin white, brittle, odorless solid.	OSHA PEL 10 ug/m ³ as 8 hr TWA.	Dermal, GI disturbances by skin absorption, peripheral neuropathy and respiratory irritant by direct contact, ingestion causes hyperpigmentation of skin, inhalation causes ulceration of nasal septum.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Aluminum	Metal: silvery, ductile, odorless solid.	OSHA PEL 15 mg/m ³ as 8 hr TWA for total dust.	Upper respiratory irritant. Reported to have caused pulmonary fibrosis. Relatively inert material.	Provide respiratory support.
Antimony	Metal: silver-white, lustrous, hard, brittle solid; scale like crystals; or a dark gray, lustrous powder.	OSHA PEL 0.5 mg/m ³ as 8 hr TWA.	Irritant to nose, throat and mouth by inhalation. Skin or eye contact causes cough; dizziness; stomach cramps and unable to smell properly.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Barium	White odorless solids, soluble compounds may be liquid compounds.	OSHA PEL 10 mg/m ³ as 8 hr TWA.	Upper respiratory irritant. Irritant to eyes and skin. Ingestion causes gastroenteritis, muscle spasm.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Beryllium	Metal: a hard brittle, grey-white solid.	OSHA PEL 2 ug/m ³ as 8 Hr. TWA.	Irritant to eyes and mucous membranes, causes respiratory symptoms, weakness, fatigue and weight loss.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Carbon Dioxide, off-gas component of aerobic composting.	Colorless, odorless gas. Normal constituent of air, about 3,000 ppm.	OSHA PEL of 5,000 ppm.	Cause headache, dizziness, restlessness; dyspnea, increased heart rate, pulse and blood pressure; convulsions and asphyxia at high concentrations	Provide respiratory support. Seek medical attention immediately.

**Table 2
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Cadmium	Metal: silver-white, blue-tinged lustrous, odorless solid.	OSHA PEL 2.5 ug/m ³ as 8 hr TWA.	Inhalation causes pulmonary edema, dyspnea, cough and chest pain. Ingestion causes chills, muscle aches, nausea, vomiting and diarrhea.	Irrigate eyes immediately with water. Soap wash skin promptly. Seek medical attention immediately.
Chromium metal	Blue white to steel gray, lustrous, brittle, hard solid.	OSHA PEL 0.5 mg/m ³ as 8 hr. TWA	Histologic fibrosis of lungs by inhalation. Causes sensitive dermatitis. Poison by ingestion.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
Cobalt metal, dust and fume	Metal: odorless, silver-gray to black solid.	OSHA PEL 0.1 mg/m ³ as 8 hr. TWA	Cause cough, shortness of breath, decrease of pulmonary function by inhalation route. Ingestion and direct contact causes dermatitis, diffuse nodular fibrosis, and weight loss.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
Copper metal dusts and mists	Metal: reddish, lustrous, malleable, odorless solid.	OSHA PEL 1 mg/m ³ as 8 hr. TWA	Irritant to the nasal mucous membranes and pharynx; may cause nasal perforation; eye irritant; metallic taste; dermatitis.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
Cyanide	White granular or crystalline solids with a faint almond-like odor.	OSHA PEL 5 mg/m ³ as 8 hr. TWA	Acute inhalation (high concentrations, pure substances) can cause asphyxia and death. Absorption causes weakness, headache, confusion, nausea, vomiting, increased respiratory rate. Irritant to eyes and skin.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.

**Table 2
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Iron (oxides)	Reddish brown solid.	OSHA PEL 5 mg/m ³ as 8 hr. TWA	Relatively inert material. Repeated exposures by inhalation can cause benign pneumoconiosis.	Provide respiratory support.
Lead	A heavy, ductile, soft grey solid. Noncombustible solid. (May be in soil as a biodegraded product of leaded gasoline.	OSHA PEL 50 ug/m ³ as 8 Hr. TWA	Weakness, lassitude, and insomnia. Facial pallor, anorexia, low weight, and malnutrition. Constipation, abdominal pain and colitis. Anemia, gingival lead line, tremor, Encephalopathy, Nephropathy. Irritant to eyes. Hypertension.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Magnesium	Finely divided white particulate.	OSHA PEL OSHA PEL 15 mg/m ³ total dust as 8 hr. TWA	Irritant to eyes and nose.	Provide respiratory support.
Methylene Chloride	Colorless liquid with a chloroform-like odor. Combustible liquid.	OSHA PEL 500 ppm as 8 Hr. TWA ACGIH TLV 50 ppm as 8 Hr. TWA	Irritation to eyes and skin. fatigue, weakness, somnolence, lightheadedness, numbness, tingle limbs, nausea, potential occupational carcinogen.	Irrigate eyes immediately with water. Soap wash skin. Provide respiratory support. Seek medical attention immediately.
PCBs, Aroclor 1242, 1254 and 1260	Colorless to brown liquid with mild hydro-carbon odor	OSHA PEL 0.5 mg/m ³	Irritant to eyes and skin. Acne form dermatitis, jaundice, dark urine.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Trichloroethylene	Colorless liquid with a sweet chloroform-like odor. Class IC flammable liquid, but burns with difficulty.	OSHA PEL 50 ppm as 8 Hr. TWA OSHA 15-min STEL 200 ppm	Eye and skin irritant. Headache, vertigo, visual disturbance, tremors, somnolence, nausea, liver injury, vomiting, dermatitis, cardiac arrhythmia, potential occupational carcinogen.	Irrigate eyes immediately with water. Wash skin promptly with soap and water. Provide respiratory support. Seek medical attention immediately.

**Table 2
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
Tetrachloroethene	Colorless liquid with a mildly sweet chloroform-like odor. Noncombustible liquid, but decomposes in a fire to hydrogen chloride and phosgene.	OSHA PEL 100 ppm as 8 Hr. TWA ACGIH TLV of 50 ppm as 8 Hr. TWA	Eye, nose, and throat irritant. Nausea, flushed face, vertigo, dizziness, incoherence, headache, skin erythema, liver damage, Potential occupational carcinogen.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
DNB (Dinitrobenzene, all isomers)	Pale white or yellow solids.	OSHA PEL 1 mg/m ³ as 8 hr. ACGIH 8 hr TWA of 1.0 mg/m ³	Causes anoxia; cyanosis; anemia; jaundice; visual disturbances; bad taste; burning mouth; reproductive effects; suspected human carcinogen.	Irrigate eyes immediately with water. Water flush promptly. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
DNT (Dinitrotoluene)	Orange-yellow crystalline solid with a characteristic odor.	OSHA PEL 1.5 mg/m ³ as 8 hr. ACGIH 8 hr TWA of 0.15 mg/m ³	Causes anoxia; cyanosis; anemia; jaundice; reproductive effects; suspected human carcinogen.	Irrigate eyes immediately with water. Water flush promptly. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
HMX (Cyclotetramethylenetetranitramine) See Note 1				
RDX (Cyclonite)	White crystalline powder, combustible solid.	OSHA PEL 1.5 mg/m ³ as 8 hr. ACGIH 8 hr TWA of 1.5 mg/m ³	Skin, eye and respiratory irritations. Very similar to TNT.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
TNB (Trinitrobenzene) Refer to TNT				

**Table 2
Potential Contaminants**

Potential Contaminant	Description	Exposure Limits	Signs and Symptoms	First Aid
TNT (Trinitrotoluene)	Colorless to pale yellow, odorless solid or crushed flakes. Combustible solid.	OSHA PEL 1.5 mg/m ³ as 8 hr. TWA, ACGIH 8 hr TWA of 0.5 mg/m ³	Causes liver damage, jaundice; cyanosis; sneezing; cough; sore throat; peripheral neuropathy; muscle pain, kidney damage; cataract; sensitive dermatitis; leukocytosis; anemia and cardiac irregularities.	Irrigate eyes immediately with water. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Tetryl	Colorless to yellow, odorless, crystalline solid.	OSHA PEL 1.5 mg/m ³ as 8 hr. TWA	Causes sensitive dermatitis, itching, erythema, edema on nasal folds, cheeks and neck; keratosis; sneezing; anemia; fatigue, cough; irritability, headache; lassitude; insomnia, nausea and vomiting.	Irrigate eyes immediately with water. Water flush promptly. Soap wash skin promptly. Provide respiratory support. Seek medical attention immediately.
Biological contaminants which could include colostridium spp, coliforms, fecal coliforms, E. Coli, streptococcus fecalis, and salmonella spp. See Note 2	Microscopic organisms	to be determined	to be determined	to be determined

Note: Data is Table derived from NIOSH 1990, OSHA 1993, and ACGIH 1993-1994.

Note 1: Significant data not found, similar concerns as compared to TNT.

Note 2: More data will be made available during pilot testing of the composting technology, and the actual process design and the interface between man and machine will be better defined for purposes of assessing the exposure risk.

**Table 3
Personnel Names and Telephone Numbers**

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone</u>
Robert Hlavacek	MK Program Manager (MK PMO)	(803) 554-9367
Scott Newman	MK Senior Project Manager (MK PMO)	(803) 554-9369
Tom Payne	MK Project Manager at NSWC Crane	Office: (xxx) xxx-xxxx Home: (xxx) xxx-xxxx Radio MK 1
Robert Porter	MK Site Superintendent	Office: (xxx) xxx-xxxx Home: (xxx) xxx-xxxx Radio MK 3
Elvin Graves	MK Site Safety and Health Officer	Office: (xxx) xxx-xxxx Home: (xxx) xxx-xxxx Cellular: (xxx) xxx-xxxx 2 way radio designation: Unit xxxx Radio MK 4
John Berggen	MK Project Engineer	Office: (xxx) xxx-xxxx Radio MK 2
Jerry Smith	MK Site Quality Control Officer	Office: (xxx) xxx-xxxx
Michael Findley	MK Health and Safety Program Manager	(803) 554-9407
Cmdr. Larry Laws	NSWC Crane PWD/Eng. Dept	(812) 854-1834
Capt. J.M. Carney	NSWC Base Commander	(812) 854-1210
Jim Hunsicker or Tom Brent	NSWC Environmental Protection Services	(812) 854-6160
Adrienne Townsel-Wilson	SOUTHNAVFACENGCOM	803-743-0582
Brent Robertson	ROICC(NTR)	(812) 854-3318
Law Enforcement	NSWC Security (Base)	3300 emergency
Fire Department	NSWC Fire Department (Base)	3300 emergency (812) 854-1235
Lt. Dale Eads	NSWC E.O.D. (Base)	(812) 854-3456
Ambulance Service	NSWC Ambulance (Base)	3300 emergency (812) 854-1100
Dale Groh	NSWC Safety Directory	(812) 854-3601
Poison Control Center	Poison Control Center	(800) 942-5969
National Response Center	National Response Center	(800) 424-8802
Regional USEPA Emergency	USEPA (Region 5)	(910) 221-5191

**Table 3
Personnel Names and Telephone Numbers**

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone</u>
Hospital	NSWC Base Medical Facility Head Nurse (Mary Muessig)	(812) 854-1220 (812) 854-4319
Hospital	Bedford Medical Center 2900 West 16 th Street Bedford, IN 47432	(812) 275-1200
Hospital	Bloomington Hospital 601 West Second Street Bloomington, IN	(812) 336-9515
Utility Locator Service	Public Works Dept.	(812) 854-1834

Directions to NSWC Medical Department On-site:

The NSWC Fire Department coordinates the on-site ambulance service. The Medical Department is located in Building 12, off of H-2 just north of H-5.

Directions to Bedford Medical Center:

From Bloomington Gate, head east on Highway 58 to the city of Bedford, then turn left onto 16th Street. Distance to hospital is approximately 20 miles.

Directions to Bloomington Hospital:

Exit NSWC Crane on H5-45 through the Bloomington Gate, then follow Highway 45 North to Bloomington. At the intersection of Highway 45 and Highway 37, continue straight ahead over the bypass (Bloomfield Road), and follow Bloomfield Road north until it becomes 2nd Street. Continue on 2nd Street and the hospital will be on right-hand side of the road.

Note: SSHO is to make sure Table 3 and Figure 3 are included with the Work Zone Maps posted at the job site. In addition, Table 3 and Figure 3 must be posted at each office location. Table 3 must be updated to include all subcontractor points-of-contact.

Notify the SSHO of any changes in work conditions which may affect the health and safety aspects of the task. The Superintendents or designated supervisors are responsible for conducting Plan-of-the-Day meetings, Pre-Entry and Post-Entry Briefings, weekly safety meetings, and conducting or ensuring that other training is completed.

**Table 4
Training Requirements**

Identifier	Location	40-Hr. Haz. Waste	Haz. Waste Annual Ref.	Haz. Waste Supervisor	Weekly Safety Mtg.	Haz. Com.	Metals	CPR/First Aid	Respiratory Protection	Confined Space	Site-Specific	POD, Pre- & Post-Entry Brief	Other
SWMU #03/10	Ammunition Burning Ground	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ³
SWMU #10/15	Rockeye	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ³
SWMU #13/14	Mine Fill B	Y	Y	Y	Y	Y	Y ¹	Y	Y	Y ²	Y	Y	Y ³
SWMU #12/14	Mine Fill A	Y	Y	Y	Y	Y	N	Y	Y	Y ²	Y	Y	Y ³
Sampling	All locations	Y	Y	Y	Y	Y	Y ¹	Y	N	Y ²	Y	Y	Y ^{3,4}
Construction of facility	Bioremediation Facility	N	N	N	Y	Y	N	Y	O	O	Y	Y	O ³
Soil and wastewater sampling	Bioremediation Facility	Y	Y	Y	Y	Y	Y ¹	Y	Y	O ²	Y	Y	Y ⁴
Start-up and operation of facility	Bioremediation Facility	Y	Y	Y	Y	Y	Y ¹	Y	Y	O ²	Y	Y	Y ³

Y = Yes, N = No, O = Optional

- Notes:
- 1 - Competent person per 29 CFR 1926.62 and employee hazard communication on lead; employee hazard communication on cadmium per 1926.1127, hazard communication on inorganic arsenic per 1926.1118. Employee hazard communication on the other metals per MK IH Manual Procedure 12.
 - 2 - Excavations greater than 5 feet in depth should be treated as permit required confined spaces until atmospheric monitoring proves it can be downgraded to non permit required confined space and engineering controls on excavation design are in place.
 - 3 - Competent person per 29 CFR 1926, Subpart P, Excavations.
 - 4 - 49 CFR Part 172 Subpart H for personnel required to classify, mark, select packaging, inspect, load and transport hazardous materials.

**Table 5
Selection of Personal Protective Equipment**

PPE	Level D	Modified Level D	Level C	Level B
Coveralls or other approved working apparel	Yes	Optional	Optional	Optional
Chemical-resistant clothing (coveralls; hooded, one- or two-piece chemical-resistant coveralls)		Yes		
Chemical-resistant clothing (coveralls; hooded one- or two-piece chemical splash suit; chemical-resistant hood and apron; disposal chemical-resistant coveralls)			Yes	
Chemical-resistant clothing (coveralls and long-sleeved jacket; one- or two-piece chemical splash suit; disposal chemical-resistant one-piece suit)				Yes
Boots, leather or chemical resistant, protective toe and steel shank meeting ANSI Z41.1 (29 CFR 1926.28(a)).	Yes			
Boots (inner), chemical resistant, protective toe and shank meeting ANSI Z41.1 (29 CFR 1926.28(a)).		Yes	Yes	Yes
Boot covers (outer), chemical resistant (disposable)		Optional	Optional	Optional
Safety glasses or chemical splash goggles, meeting ANSI Z87.1-1979 for "Industrial Safety Glasses"	Yes	Yes	Yes	
Face shield	Optional	Optional	Optional	Optional
Gloves (cotton/leather)	Optional			
Gloves (inner), chemical resistant or liners		Optional	Yes	Yes
Gloves (outer), chemical resistant		Yes	Yes	Yes
Long underwear		Optional	Optional	Optional
Hardhat	Yes	Yes	Yes	Yes
Positive pressure, full-facepiece with nose cup, self-contained breathing apparatus (SCBA) or positive pressure, supplied-air respirator with escape SCBA (MSHA or NIOSH approved) (Note: escape SCBA may not be required)				Yes
Air-purifying respirator, half-face or full face with suitable cartridge (MSHA or NIOSH approved)			Yes	

Note: Optional requirements to be determined by SSHA based on activity hazard analysis.

**Table 6
Minimum Personal Protective Equipment Requirements by Task**

Site	Activity	PPE
Soil excavation at SWMU #03/10	1. Excavate and load soils for Composting 2. Site restoration	1. Level C 2. Level D
Soil excavation at SWMU #10/15	1. Excavate and load soils for Composting 2. Site restoration	1. Level C 2. Level D
Soil excavation at SWMU #13/14	1. Excavate and load soils for Composting 2. Site restoration	1. Level C 2. Level D
Soil excavation at SWMU #12/14	1. Excavate and load soils for Composting 2. Site restoration	1. Level C 2. Level D
Sampling at all locations	1. Obtain soil and/or groundwater samples	1. Modified Level D
Construction of Bioremediation Facility	1. Site, construct and install all equipment	1. Level D, modified where necessary by the SSHO dependent on construction task.
Start-Up and Operations of Bioremediation Facility	1. Receive and load soils for screening 2. Receive and load amendments 3. Transport and off-load for composting 4. Maintain windrows in the Composting Facility 5. Load and transport treated soils 6. Offload treated soil and site restoration 7. Maintenance and Upkeep of Equipment	1. Level C, modify where necessary 2. Level C, modify where necessary 3. Level C, modify where necessary 4. Level C, modify where necessary 5. Level D, modify where necessary 6. To be determined 7. To be determined

**Table 7
Airborne Contaminant Response Criteria**

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Volatile organic compounds	No more than 5 ppm above background, no benzene detected	Level D or modified Level D	Prior to each shift and reentry following 30 minute vacancy or as warranted	Continue periodic monitoring
	Greater than 5 ppm above background but less than 10 ppm above background. No benzene detected, no Action Level for any organic exceeded.	Level D or Modified Level D	At least once every hour, when change in operation occurs, or when requested by workers	Monitor for benzene or other organics. Continue periodic monitoring
	Greater than 10 ppm above background or benzene detected or Action Level exceeded for any organic.	To be determined by SSHO	To be determined by SSHO	Stop work and notify SSHO
Lead (inorganic)	Less than action level for lead (30 µg/m ³) and/or no visible observation of excessive dusts	Level C	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	Level C or as determined by SSHO	Representative personnel sampling and monitoring to be conducted or continued	Stop work and notify SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	As determined by SSHO	Representative personnel sampling and monitoring to be conducted or continued	Stop work and notify SSHO
Oxygen	Less than 19.5%	To be determined by SSHO	To be determined by SSHO	Stop work, exit area and immediately notify SSHO
Arsenic (inorganic)	Less than action level for arsenic (inorganic) of (5 µg/m ³) and/or no visible observation of excessive dusts	Level C	Periodic per plan	Continue monitoring and/or sampling and observations

**Table 7
Airborne Contaminant Response Criteria**

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Arsenic (inorganic), continued	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
Cadmium	Less than action level for cadmium of (2.5 µg/m ³) and/or no visible observation of excessive dusts	Level C	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
Explosives Residues	Less than the action level for the explosive compound having the lowest action level (DNB, 0.5 mg/m ³) and/or no visible observation of excessive dusts	Level C	Periodic per plan	Continue monitoring and/or sampling and observations
	Greater than action level or visible observation of excessive dusts.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO
	Greater than OSHA PEL or greater than 10 mg/m ³ total dust.	To be determined by SSHO	To be determined by SSHO	To be determined by SSHO

**Table 7
Airborne Contaminant Response Criteria**

Contaminant	Level	PPE	Monitoring Frequency	Actions Taken
Carbon Dioxide (CO ₂)	Greater than 4,000 ppm	To be determined by SSHO	Periodic per plan inside of Composting Facility	Stop work, shut off equipment and evacuate Composting Facility. Notify SSHO; ventilate structure
% LEL	Equal to or greater than 10%.	To be determined by SSHO	To be determined by SSHO	Stop work, shut off equipment, remove ignition sources if safe to do so; notify SSHO

**Table 8
Frequency of Physiological Monitoring for Fit and Acclimatized Workers¹**

ADJUSTED TEMPERATURE ²	IMPERMEABLE ENSEMBLE
90°F (32.2°C) or above	After each 15 minutes of work
87.5°-90°F (30.8°-32.2°C)	After each 30 minutes of work
82.5°-87.5°F (28.1°-30.8°C)	After each 60 minutes of work
77.5°-82.5°F (25.3°-28.1°C)	After each 90 minutes of work
72.5°-77.5°F (22.5°-25.3°C)	After each 120 minutes of work

¹For work levels of 250 kilocalories/hour.

²Calculate the adjusted air temperature (ta adj) by using this equation:

$$ta \text{ adj } ^\circ F = ta^\circ F + (13 \times \% \text{ sunshine}).$$

Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow.

(100 percent sunshine = no cloud cover and a sharp, distinct shadow: 0 percent sunshine = no shadows.)

Note: Reprinted from *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH 1985).

**Table 9
Monitoring and Sampling Requirements**

Site	Activity	Monitor						Sample		
		VOC	Dust	Oxygen and % LEL	Perimeter (VOCs /Dust)	Noise	Heat Stress	VOC	Metals	Explosives
SWMU 03/10	1. Excavate and load soils for Composting	O	Y	O	O	Y	O	Y	Y	Y
	2. Site restoration waste handling	O	O	O	O	Y	O	O	O	O
SWMU 10/15	1. Excavate and load soils for Composting	O	Y	O	O	Y	O	O	Y	Y
	2. Site restoration	O	O	O	O	O	O	O	O	O
SWMU 13/14	1. Excavate and load soils for Composting	O	Y	O	O	Y	O	O	Y	Y
	2. Site restoration	O	O	O	O	O	O	O	O	O
SWMU 12/14	1. Excavate and load soils for Composting	O	Y	O	O	Y	O	O	N	Y
	2. Site restoration	O	O	O	O	O	O	O	N	O
Sampling	1. Obtain soil samples	Y ¹	N	Y ¹	N	N	N	N	N	N
Construction of Bioremediation Facility	1. Site, construct and install all equipment	O	Y	O	O	Y	O	O	N	N
Start-up and Operations of Bioremediation Facility	1. Receive and load soils for screening.	O	Y	N	O	Y	O	O	Y	Y
	2. Receive and load amendments.	N	Y	N	O	Y	O	O	O	O
	3. Transport and off-load for composting.	N	Y	N	O	Y	O	O	O	O
	4. Maintain windrows in the Composting Facility.	O	Y	Y ²	O	Y	O	O	O	O
	5. Load and transport treated soils.	N	Y	O	O	O	O	O	O	N
	6. Off-load treated soil and site restoration	N	O	N	N	O	O	O	O	N
	7. Maintenance and Upkeep of Equipment.	O	N	O	N	O	O	O	O	N
Sampling	1. Obtain soil and wastewater samples	Y ¹	N	Y ¹	N	N	N	N	N	N

Y = Yes, O = Optional at discretion of SSHO, N = Not required

¹ = When obtaining soil samples in excavations deeper than 5 feet, treat the excavation as permit-required confined space until it has been assessed by atmospheric monitoring that the atmosphere is safe and it can be downgraded to nonpermit-required confined space. Engineering controls must be in place to safeguard excavation from collapse.

² = In addition to LEL and O₂, conduct periodic monitoring for CO₂ levels inside of the Composting Facility.

FIGURES



MORRISON KNUDSEN CORPORATION

ENGINEERING, CONSTRUCTION, AND ENVIRONMENTAL GROUP

EXCAVATION AND TRENCHING PERMIT

(OSHA Section 1926.650)

DATE:	TIME:	DATE EXPIRES															
JOB DESCRIPTION AND LOCATION (Be Specific):																	
BEFORE TRENCHING AND EXCAVATION																	
<input type="checkbox"/> Soil Classification <input type="checkbox"/> Stable <input type="checkbox"/> Type A <input type="checkbox"/> Type B <input type="checkbox"/> Type C Rock	<input type="checkbox"/> Check For Previously Disturbed Ground <input type="checkbox"/> Adequacy and Availability of All Equipment, Including Personal Protective Gear, Shoring Material, Signs, Barricades and Machinery. <input type="checkbox"/> Other Known Obstructions (e.g. Footing Concrete Encasement) <input type="checkbox"/> Allowable Slope.	<input type="checkbox"/> Check For Proximity To Utilities, Buildings, Footing or Piling and Sources of Vibrations. <input type="checkbox"/> Owners of Utilities, Services or Transmission Piping, Etc. (Electrical, Telephone, Water, Sewer)															
COMMENTS:																	
DURING TRENCHING AND EXCAVATION																	
<input type="checkbox"/> Size of Excavation Depth _____ Width _____ Length _____ <input type="checkbox"/> Changing Ground Conditions, Particularly After Rain Fall <input type="checkbox"/> Monitor For Possible Oxygen Deficiency Or Gaseous Conditions. (Record per IH Manual Procedure 5.0 or equivalent). _____	<input type="checkbox"/> Protective Systems Depth of A Trench Or Excavation of 5 Feet or More. <u>Check The Applicable OSHA Appendix Below:</u> <input type="checkbox"/> B - Sloping and Benching <table style="margin-left: 20px; border: none;"> <tr><td colspan="3">Maximum Allowable Slopes</td></tr> <tr><td>Stable Rock</td><td>Vertical</td><td>(90°)</td></tr> <tr><td>Type A</td><td>3/4:1</td><td>(53°)</td></tr> <tr><td>Type B</td><td>1:1</td><td>(45°)</td></tr> <tr><td>Type C</td><td>1 1/2:1</td><td>(34°)</td></tr> </table>	Maximum Allowable Slopes			Stable Rock	Vertical	(90°)	Type A	3/4:1	(53°)	Type B	1:1	(45°)	Type C	1 1/2:1	(34°)	NOTE: Sloping or Benching For Excavations Greater Than 20 Feet Deep Shall Be Designed By A State Registered Professional Engineer (RPE).
Maximum Allowable Slopes																	
Stable Rock	Vertical	(90°)															
Type A	3/4:1	(53°)															
Type B	1:1	(45°)															
Type C	1 1/2:1	(34°)															
<input type="checkbox"/> Adequacy of Shoring And/Or Sloping As Work Progresses. <input type="checkbox"/> Entrances and Exit Facilities <input type="checkbox"/> Stairway <input type="checkbox"/> Ladders <input type="checkbox"/> Ramp <input type="checkbox"/> Change In Vehicular and Machinery Operation <input type="checkbox"/> Water Removal Equipment and Operation <input type="checkbox"/> Adequacy of Portable Trench Boxes or Trench Shields	<input type="checkbox"/> C - Timber Shoring For Trenches <input type="checkbox"/> D - Aluminum Hydraulic Shoring For Trenching <input type="checkbox"/> RPE - Designed Protection Systems (data must be filed on job-site)	COMMENTS:															
SIGNATURES AND DATES																	
COMPETENT PERSON:	SSHO:	PROJECT MANAGER:															
CLIENT REPRESENTATIVE:	CIVIL ENGINEER:	CIVIL SUPERINTENDENT:															
EQUIPMENT OPERATOR:	SUBCONTRACTOR REP:	OTHER APPROVAL:															

Figure 2 Hot Work Permit



HOT WORK PERMIT

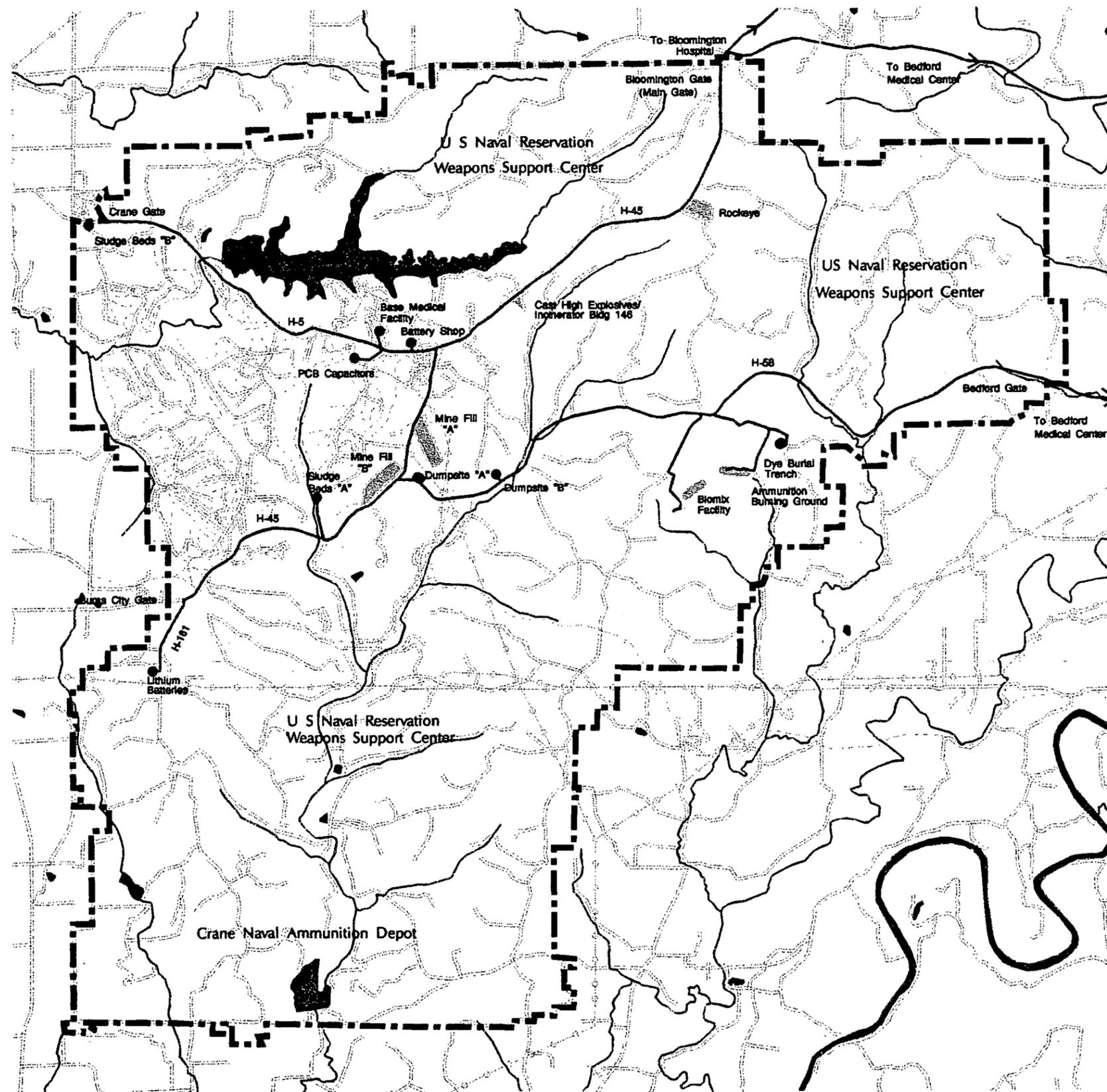
Issued to:	Responsible Person:	Date:
Building:	Area Equipment	Control No.
Special Work To Be Done:		Time From/To:
Please check appropriate response		YES NO N/A
1. Has affected personnel been briefed on job safety & requirements?		
2. Has equipment been properly prepared for this work?		
3. Does other work or processes affect this work?		
4. Has fire detection and/or gas systems been isolated?		
5. Is the work area clean and ready for work to begin?		
6. Has isolation lockout been completed? If so, record lock and tag numbers below.		
7. Has fire watch been assigned with appropriate equipment? Name(s)		
8. Is GAS TEST required? <input type="checkbox"/> Yes <input type="checkbox"/> No Test Results Percent LEL O ₂ H ₂ S, CO, other toxic		Time Tester
Continuous? <input type="checkbox"/> Yes <input type="checkbox"/> No Total Hydrocarbons Others As Req.		
Remarks:		
Special Instructions: <input type="checkbox"/> Yes <input type="checkbox"/> No	Lock Numbers	Tag Numbers
Job Completed? <input type="checkbox"/> Yes <input type="checkbox"/> No	Time/Initial:	Permit Cancelled: (Time)

Endorsements as Required

Area Operations Technician:	Signature/Name:	Time:
Person Doing The Work:		
Job Supervisor/Foreman:		
Project Supervisor:		
SSHO (Safety)		

Figure 3 Directions to Nearest Emergency Medical Facilities

Figure 3
Directions to the Nearest
Medical Facility



Legend

- Primary Route
- - - Naval Reservation Boundary

Directions to NSWC Medical Department on site:

The NSWC Medical Department manages and coordinates the on-site ambulance service. Located in Building 12 off of H-2 just north of H-5.

Directions to Bedford Medical Center:

From Main Gate, head east on Highway 58 to the city of Bedford, left onto 16th street. Distance to hospital is approximately 20 miles.

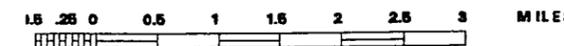
From Bedford Gate, head east on I58 to the city of Bedford. I58 turns into 16th street.

Directions to Bloomington Hospital:

Exit Base on H5-45 through the Bloomington Gate, follow Highway 45 North to Bloomington. At Highway 45 and Highway 37, continue going straight over the bypass (Bloomfield Road), follow Bloomfield road north which turns into 2nd Street. Follow 2nd Street and hospital is on your right.



1 inch = 1.5 miles



MORRISON KNUDSEN CORPORATION
 Engineering, Construction
 & Environmental Group

Figure 6 SSHP Daily Inspection Checklist

Surveillance No. _____

SURVEILLANCE NO:		ACTIVITY:				PROJECT NO:	
DATE:		LOCATION:				SURVEYED ORGANIZATION:	
		SITE/AREA CONTACT:		RESPONSIBLE MANAGER:		PRIME:	
						SUBTIER:	
ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DIS- CREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
Section 1							
1	Scope of work and site contaminants accurately described?						
Section 2							
2	Activity hazard analysis prepared for each major work phase? (EM 385-1-1, Section 01.A.09)						
3	All hazards including chemical and physical adequately described?						
Section 3							
4	Roles and responsibilities described and personnel roster up-to-date?						
Section 4							
5	All site personnel completed required training?						
6	Training documented and records on site?						
Section 5							
7	All site personnel completed initial medial qualification?						
Section 6							
8	PPE available and in good condition?						
9	PPE work per SSHP and/or SSHO direction?						
10	Personnel trained in proper use, limitations, and inspection of PPE?						

Figure 6 SSHP Daily Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DIS- CREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
11	PPE inspected per SSHP?						
12	PPE donning/doffing procedures in place?						
13	Written SOP available describing respirator selection and use?						
Section 7							
14	Air monitoring conducted per SSHP?						
15	Monitoring equipment properly maintained and calibrated?						
16	Employees notified of monitoring results?						
17	Chain of custody prepared and maintained for all samples?						
Section 8							
18	Weekly safety meeting held?						
19	Pre-entry briefs held? and signature sheet completed?						
20	Haz Com programs in place?						
21	Competent person evaluates excavation?						
22	Personnel responsible for work maintain control of area?						
Section 9							
23	Work zone maps prepared and updated?						
24	Maps posted near work area and stored in SSHP?						
25	Traffic patterns established and rules observed?						
Section 10							
26	Inspections performed of all personnel, clothing and equipment leaving exclusion zone?						

Figure 6 SSHP Daily Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DIS- CREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
27	All materials decontaminated prior to existing contamination reduction zone?						
28	Decon stations properly established?						
29	Proper personal hygiene practices observed?						
30	Decon solutions collected and properly disposed of?						
Section 11							
31	At least two employees on each shift trained in CPR and first aid?						
32	First aid kit at each work site?						
33	All first aid and medical cases promptly reported to SSHO?						
Section 12							
34	All personnel trained on Emergency Response Plan and Contingency Procedures?						
35	Emergency pre-planning addressed in safety meeting?						
36	List of emergency services/contact is up to date and posted?						
37	Assembly points identified and communicated to employees?						
38	Evacuation routes established and communicated to employees?						
39	Communication methods are adequate						
40	All drills, exercises, and emergencies critiqued?						
41	All emergencies promptly reported to SSHO?						
Section 13							
42	SSHO maintains project log book?						
43	Daily reports completed by SSHO?						

Figure 6

SSHP Daily Inspection Checklist (Continued)

Surveillance No. _____

ITEM NO.	DESCRIPTION OF SURVEYED ITEMS	N/A SAT UNSAT	DESCRIPTION OF DIS- CREPANCY/ NON-COMPLIANCE	ACT OR COND	CAT	REQUIRED ABATEMENT DATE	CORRECTIVE ACTION TAKEN AND DATE ABATEMENT COMPLETED
44	Daily inspections completed by SSHO?						
45	Weekly reports prepared by SSHO?						
46	Records of all injuries and illnesses maintained by SSHO?						
Section 14							
47	Work plans available and up to date?						
48	SOPs developed as needed?						
Section 15							
49	Two-way radios available per SSHP?						
50	Cellular telephone available as needed?						
51	Emergency alarms available and personnel trained on what actions to take?						
52	Drills and exercises conducted to test communication methods?						
Section 16							
53	Spill response measures reviewed with personnel?						
54	Suitable quantities of spill supplies available?						
55	Spills promptly reported to SSHO?						
56	Operations arranged to minimize spills?						
Section 17							
57	Confined space requirements of 385-1-1, Section 06.0.01 followed? Personnel trained?						

Inspection Performed By: _____ Date: _____

Abatement Accepted By: _____ Date: _____

APPENDIX A

ACTIVITY HAZARD ANALYSIS

ACTIVITY HAZARD ANALYSIS

SWMUs #03/10, #10/15, #12/14, & #13/14

ACTIVITY HAZARD ANALYSIS

SWMUs #03/10, #10/15, #12/14, & #13/14

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: General Soil Excavation Activity and Transport for Composting, SWMU 03/10	Analyzed By/Date: _____	Reviewed By/Date: _____
Activity	Hazard	Recommended Controls
<p>1.1 Walk area down, establish work zone, haul routes, get permit and begin soil excavation.</p> <p>1.2 Soil, load and haul activity</p>	<p>1.1a. Contact with underground utilities or process piping.</p> <p>1.1b. Contact with unexploded ordnance.</p> <p>1.1c. Struck by and struck against physical objects during clearing and grubbing.</p> <p>1.1d. Biological; weeds, snakes, spider's; other plant life.</p> <p>1.1e. Contact by inhalation, direct contact or ingestion of chemical contaminants.</p> <p>1.2a. Struck by and struck against physical objects during load and haul operations.</p> <p>1.2b. Spread of contaminated materials.</p>	<p>1.1a. Excavation and Trenching Permit completed and in place at excavation site. Utility locates coordinated by MK onsite PM through the NSWC PWD.</p> <p>1.1b. MK PM to reverify with NSWC the necessity for UXO Survey.</p> <p>1.1c. MK SSHO to lead Plan of Day meeting reviewing clearing and grubbing safety based on EM-385-1 Section 31.</p> <p>1.1d. MK SSHO to research and discuss specific biological hazards awareness with NSWC Medical and/or Safety/IH department and plan for and communicate findings at POD and/or Pre Entry Briefs.</p> <p>1.1e. Level C PPE specified. Personal air sampling required. Dust control by wetting required. Personal decontamination required.</p> <p>1.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.I by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established.</p> <p>1.2b. Vehicle decontamination station and covered loads during transport. MK SSHO to assess and modify decontamination and PPE requirements from time load is covered, during transport and offloading activities. Criteria reviewed at Pre-Entry Briefs.</p>
<p>1.4 Heavy equipment for excavation and hauling. Clearing and grubbing handtools.</p>	<p>Daily, prior to use per manufacturer's recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.</p>

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: General Soil Excavation Activity and Transport for Composting, SWMU 12/14		Analyzed By/Date:	Reviewed By/Date:
Activity		Hazards	Recommended Controls
2.1 Walk area down, establish work zone, haul routes, get permit and begin soil excavation.	2.1a. Contact with underground utilities or process piping. 2.1b. Contact with unexploded ordnance. 2.1c. Struck by and struck against physical objects during clearing and grubbing. 2.1d. Biological; weeds, snakes, spiders; other plant life. 2.1e. Contact by inhalation, direct contact or ingestion of chemical contaminants.	2.1a. Excavation and Trenching Permit completed and in place at work site. Utility locates coordinated by MK onsite PM through the NSWC PWD. MK PE must assess undermining of structural supports. 2.1b. MK PM to reverify with NSWC the necessity for UXO Survey. 2.1c. MK SSHO to lead Plan of Day meeting reviewing clearing and grubbing safety based on EM-385-1 Section 31. 2.1d. MK SSHO to research and discuss specific biological hazards awareness with NSWC Medical and/or Safety/IH department and plan for and communicate findings at POD and/or Pre Entry Briefs. 2.1e. Level C PPE specified. Personal air sampling required. Dust control by wetting required. Personal decontamination required.	
2.2 Soil, load and haul activity	2.2a. Struck by and struck against physical objects during load and haul. 2.2b. Spread of contaminated materials.	2.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.1 by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established. 2.2b. Vehicle decontamination station and covered loads during transport. MK SSHO to assess and modify decontamination and PPE requirements from time load is covered, during transport and offloading activities. Criteria reviewed at Pre-Entry Briefs.	
Equipment	Equipment	Equipment	
2.4 Heavy equipment for excavation and hauling. Clearing and grubbing handtools.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: General Soil Excavation Activity and Transport for Composting, SWMU 12/13	Analyzed By/Date:	Reviewed By/Date:
<p>3.1 Walk area down, establish work zone, haul routes, get permit and begin soil excavation.</p> <p>3.2 Soil, load and haul activity</p>	<p>3.1a. Contact with underground utilities or process piping.</p> <p>3.1b. Contact with unexploded ordnance.</p> <p>3.1c. Struck by and struck against physical objects during clearing and grubbing.</p> <p>3.1d. Biological; weeds, snakes, spiders; other plant life.</p> <p>3.1e. Contact by inhalation, direct contact or ingestion of chemical contaminants.</p> <p>3.2a. Struck by and struck against physical objects during load and haul.</p> <p>3.2b. Spread of contaminated materials.</p>	<p>3.1a. Excavation and Trenching Permit completed and in place at work site. Utility locates coordinated by MK onsite PM through the NSWC PWD. MK PE must assess undermining of structural supports.</p> <p>3.1b. MK PM to reverify with NSWC the necessity for UXO Survey.</p> <p>3.1c. MK SSHO to lead Plan of Day meeting reviewing clearing and grubbing safety based on EM-385-1 Section 31.</p> <p>3.1d. MK SSHO to research and discuss specific biological hazards awareness with NSWC Medical and/or Safety/IH department and plan for and communicate findings at POD and/or Pre Entry Briefs.</p> <p>3.1e. Level C PPE specified. Personal air sampling required. Dust control by wetting required. Personal decontamination required.</p> <p>3.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.1 by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established.</p> <p>3.2b. Vehicle decontamination station and covered loads during transport. MK SSHO to assess and modify decontamination and PPE requirements from time load is covered, during transport and offloading activities. Criteria reviewed at Pre-Entry Briefs.</p>
<p>3.4 Heavy equipment for excavation and hauling. Clearing and grubbing handtools.</p>	<p>Daily, prior to use per manufacturer's recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.</p>

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: General Soil Excavation Activity and Transport for Composting, SWMU 10/15		Analyzed By/Date:	Reviewed By/Date:
4.1 Walk area down, establish work zone, haul routes, get permit and begin soil excavation.	4.1a. Contact with underground utilities or process piping. 4.1b. Contact with unexploded ordnance. 4.1c. Struck by and struck against physical objects during clearing and grubbing. 4.1d. Biological; weeds, snakes, spiders; other plant life. 4.1e. Contact by inhalation, direct contact or ingestion of chemical contaminants.	4.1a. Excavation and Trenching Permit completed and in place at work site. Utility locates coordinated by MK onsite PM through the NSWC PWD. 4.1b. MK PM to reverify with NSWC the necessity for UXO Survey. 4.1c. MK SSHO to lead Plan of Day meeting reviewing clearing and grubbing safety based on EM-385-1 Section 31. 4.1d. MK SSHO to resarch and discuss specific biological hazards awareness with NSWC Medical and/or Safety/IH department and plan for and communicate findings at POD and/or Pre Entry Briefs. 4.1e. Level C PPE specified. Personal air sampling required. Dust control by wetting required. Personal decontamination required.	
4.2 Soil, load and haul activity	4.2a. Struck by and struck against physical objects during load and haul. 4.2b. Spread of contaminated materials.	4.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.I by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established. 4.2b. Vehicle decontamination station and covered loads during transport. MK SSHO to assess and modify decontamination and PPE requirements from time load is covered, during transport and offloading activities. Criteria reviewed at Pre-Entry Briefs.	
4.4 Heavy equipment for excavation and hauling. Clearing and grubbing handtools.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Field Sampling Activities for Soil.		Analyzed By/Date:	Reviewed By/Date:
5.0. Principal Steps	Potential Hazards	Recommended Controls	
5.1. Hand augering (in excavations)	5.1a. Collapse of excavation, entrance and egress, contaminated soil contact, contact with underground utility or piping/ mechanical system.	5.1a. Sampler requires approval from competent person to enter excavation if deeper than 5 foot. Atmospheric conditions in excavation checked prior to and during sampling. Modified Level D PPE expected, upgrade per SSHO review. Analyze for potential contact with any underground utility or mechanical service. Note: Excavation Permit must be valid. Review Field Sampling Kit MSDSs.	
5.2. Hand augering (non excavated areas)	5.2a. Contaminated soil contact, contact with utility or piping/ mechanical system.	5.2a. Excavation/Trenching Permit required for sampling, analyze for potential contact with any underground utility or mechanical service. Level D PPE expected, upgrade per SSHO review. Review Field Sampling Kit MSDSs.	
5.3. Containerized Liquids Sampling	5.3a. Contaminated liquid contact.	5.3a. Level D+ PPE.	
5.4. Sampling Equipment Decontamination	5.4a. Contact with contaminated material, also direct contact with decontamination solutions (weak nitric acid and acetone)	5.4a. Level D+ PPE with splash goggles and chemical gloves.	
5.5. Equipment to be Used	Inspection Requirements	Training Requirements	
5.6. Soil auger, stainless steel spoons, buckets, field sampling kits and decontamination solutions.	Per manufacturers recommendation. Core drilling equipment if used must be inspected daily. Preplan waste handling.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator. DOT 181 certification for person supervising the preparation of contaminated materials for offsite shipment.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Decontamination Facility Operations, Personnel and Equipment.		Analyzed By/Date:	Reviewed By/Date:
6.0. Principal Steps	Potential Hazards	Recommended Controls	
6.1. Receive and place material at facility.	6.1a. Struck by and struck against. Material handling concerns.	6.1a. Site Decontamination Facility to provide isolation and controlled access. MK SSHO and Project Supervisor(s) to review material handling procedures to insure good practices and approved equipment is used which conforms to OSHA and EM-381 Section 28.I requirements.	
6.2. Decontaminate Equipment using high pressure wash or hand scrubbing and/or automatic wash on vehicle tires and undercarriage.	6.2a. Contact with contaminated material and cross contamination; inhalation of airborne aerosols; contact with high pressure wash stream; unexpected movement of material to be decontaminated.	6.2a. Level C PPE with faceshield, modify per SSHO review. Secure items to be decontaminated. Visual inspect integrity of Facility's containment liners and containers used for waste waters. Clean side area established for worker's street clothes and approved respirator storage after cleaning and sanitizing.	
6.3. Equipment to be Used	Inspection Requirements	Training Requirements	
6.4. High pressure wash with soap solution; other decontamination solutions; scrub brushes; material handling equipment and securing equipment. Personal showers; wash and change facilities.	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, and Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Temporary storage and shipment of contaminated soils or debris.
(May or may not be applicable)

Analyzed By/Date:

Reviewed By/Date:

7.0 Principal Steps	Potential Hazards	Recommended Controls
<p>7.1. Determine if contaminated, store in designated location.</p> <p>7.2. Shipment of contaminated soils or material offsite for disposal.</p>	<p>7.1a. Contact with contaminated material during screening, loss of containment of contaminated material.</p> <p>7.2a. Contact with contaminated material during loading if not already in container, loss of containment of contaminated material, unsecured loads.</p>	<p>7.1a. Level C PPE during initial screening of soil, upgrade per SSHO direction. Stockpile soil on polyethylene sheeting, surround with haybales and cover. Secure area as Exclusion Zone. If roll-off containers used, inspect container for integrity and containment, secure area and cover.</p> <p>7.2a. Level D+ during material handling, upgrade per SSHO direction. Inspect shipping containers for integrity and containment, comply with all DOT/EPA shipping requirements. Insure provisions for decontamination of any loading equipment.</p>
7.3 Equipment to be Used	Inspection Requirements	Training Requirements
<p>7.4. Polyethylene sheeting, hay bales, material handling equipment and 40 cubic yard roll-off containers.</p>	<p>Before use per manufacturers recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator and DOT 181 certification for person supervising the preparation of contaminated materials for offsite shipment.</p>

ACTIVITY HAZARD ANALYSIS
SOILS BIOREMEDIATION FACILITY

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Receive contaminated soil and stage, feed into screener		Analyzed By/Date: _____	Reviewed By/Date: _____
		Hazard	Control
<p>1.1 Walk area down, establish work zone and laydown of process pile.</p>	<p>1.1a. Struck by and struck against physical objects during loading and unloading operations.</p> <p>1.1b. Biological; weeds, snakes, spider's; other plant life.</p> <p>1.1c. Contact by inhalation, direct contact or ingestion of chemical contaminants.</p>	<p>1.1a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment.</p> <p>1.1b. MK SSHO to discuss specific biological hazards awareness and communicate findings at POD and/or Pre Entry Briefs.</p> <p>1.1c. Level C PPE specified. Personal air sampling required. Dust control by wetting required. Personal decontamination required.</p>	
<p>1.2 Feed material into the Screener.</p>	<p>1.2a. Struck by and struck against physical objects during load and haul operations.</p> <p>1.2b. Spread of contaminated materials.</p>	<p>1.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment.</p> <p>1.2b. Engineering Controls in place on Screener. Offloading methods to limit airborne materials reviewed and discussed with equipment operators. Criteria reviewed at Pre-Entry Briefs.</p>	
		Equipment	Training
<p>1.4 Heavy equipment for loading and hauling. Handtools.</p>	<p>Daily, prior to use per manufacturer's recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.</p>	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Operation of Screener		Analyzed By/Date:	Reviewed By/Date:
2.0	Potential Hazards	Recommended Controls	
2.1 TBD	2.1a. Rotating, Vibrating Machinery.	2.1a. Physical hazards safeguarding on equipment, SOPs in place for operations. Cautions and Warnings labeled on equipment.	
2.2 TBD	2.1b. Airborne aerosols; chemical and biological.	2.1b. Engineering controls in place on equipment (enclosure, ventilation). PPE Level C, downgrade based on air sampling results and operating experience.	
2.3	Equipment	Training Requirements	
2.4 Screener	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator and Operator Training.	

Need to complete worksheet once Vendor data is available on equipment.

TBD: to be determined

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Operation of Crusher	Analyzed By/Date:	Reviewed By/Date:
Equipment	Identified Hazards	Recommended Controls
3.1 TBD	3.1a. Rotating, Vibrating Machinery.	3.1a. Physical hazards safeguarding on equipment, SOPs in place for operations. Cautions and Warnings labeled on equipment.
3.2 TBD	3.1b. Airborne aerosols; chemical and biological.	3.1b. Engineering controls in place on equipment (enclosure, ventilation). PPE Level C, downgrade based on air sampling results and operating experience.
Equipment	Training Requirements	Training Requirements
3.4 Crusher	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator, Operator Training.

Need to complete worksheet once Vendor data is available on equipment.

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Operation of Soil Mixer		Analyzed By/Date:	Reviewed By/Date:
4.1 TBD	4.1a. Rotating, Vibrating Machinery.	4.1a. Physical hazards safeguarding on equipment, SOPs in place for operations. Cautions and Warnings labeled on equipment.	
4.2 TBD	4.1b. Airborne aerosols; chemical and biological.	4.1b. Engineering controls in place on equipment (enclosure, ventilation). PPE Level C, downgrade based on air sampling results and operating experience.	
4.4 Mixer	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator, Operator Training.	

Need to complete worksheet once Vendor data is available on equipment.

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Receive Amendments for soil and stage, feed into screener

Analyzed By/Date:

Reviewed By/Date:

Sub-Component	Identified Hazard	Recommended Controls
<p>5.1 Walk area down, establish work zone and laydown of process pile.</p> <p>5.2 Feed material into the Screener.</p>	<p>5.1a. Struck by and struck against physical objects during loading and unloading operations.</p> <p>5.1b. Biological; weeds, snakes, spider's; other plant life.</p> <p>5.1c. Contact by inhalation, direct contact or ingestion of biological contaminants.</p> <p>5.1d. Spontaneous combustion of amendments in storage; also rodent and insect control during storage.</p> <p>5.2a. Struck by and struck against physical objects during load and haul operations.</p> <p>5.2b. Spread of contaminated materials.</p>	<p>5.1a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. SOPs in place for operations.</p> <p>5.1b. MK SSHO to discuss specific biological hazards awareness and communicate findings at POD and/or Pre Entry Briefs.</p> <p>5.1c. Level C PPE specified. Personal air sampling may be required for biological agents. Dust control must be established. Personal decontamination required.</p> <p>5.1d. Preplanned safe storage of amendments per NFPA Codes (50 feet from any building) and operational experience.</p> <p>5.2a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. SOPs in place for Operations.</p> <p>5.2b. Engineering Controls in place on Screener (Enclosure, Ventilation). Offloading methods to limit airborne materials reviewed and discussed with equipment operators. Criteria reviewed at Pre-Entry Briefs.</p>
Equipment	Training Requirement	Training Requirement
<p>5.4 Heavy equipment for loading and hauling. Handtools.</p>	<p>Daily, prior to use per manufacturer's recommendation.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.</p>

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Soil Amendment Mix transport from Mixer to Bioremediation Facility for Composting		Analyzed By/Date:	Reviewed By/Date:
6.1 Principal Step	Potential Hazards	Recommended Controls	
6.1 TBD	<p>6.1a. Struck by and struck against physical objects during loading and unloading operations.</p> <p>6.1b. Biological; weeds, snakes, spider's; other plant life.</p> <p>6.1c. Contact by inhalation, direct contact or ingestion of biological or chemical contaminants.</p>	<p>6.1a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. SOPs in place for operations.</p> <p>6.1b. MK SSHO to discuss specific biological hazards awareness and communicate findings at POD and/or Pre Entry Briefs.</p> <p>6.1c. Level C PPE specified. Personal air sampling may be required for biological agents. Dust control must be established. Personal decontamination required.</p> <p>Note: soil will be very wet at this time, airborne potential significantly less.</p>	
6.2 TBD			
6.3 Equipment to be Used	Training Requirements	Training Requirements	
6.4 Heavy equipment for loading and hauling.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Composting Facility, Operation of Windrow Machine		Analyzed By/Date:	Reviewed By/Date:
7.1 TBD	7.1a. Rotating Machinery	7.1a. Physical hazards safeguarding, SOPs in place for operations, Cautions and Warnings labeled on equipment.	
	7.1b. Fuel Source; electric, gasoline or diesel (TBD)	7.1b. Equipment must be approved for indoor use, wet environment by U.S. Rating or Listing organization. GFCI protection required. Approved fuel handling and storage per NFPA 30.	
7.2 TBD			
7.4 Windrow Machine, others TBD.	Daily, prior to use per manufacturer's recommendation. GFCI system tested quarterly.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator, Operator Training.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Composting Facility, Amendment Addition

Analyzed By/Date:

Reviewed By/Date:

8.1 TBD	<p>8.1a. Struck by and struck against physical objects during loading and unloading operations.</p> <p>8.1b. Biological; weeds, snakes, spiders; other plant life.</p> <p>8.1c. Contact by inhalation, direct contact or ingestion of biological and or chemical contaminants.</p>	<p>8.1a. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Backup alarms on all motorized heavy equipment. SOPs in place for operations.</p> <p>8.1b. MK SSHO to discuss specific biological hazards awareness and communicate findings at POD and/or Pre Entry Briefs.</p> <p>8.1c. Level C PPE specified. Personal air sampling may be required for biological agents. Dust control must be established. Personal decontamination required.</p> <p>8.1d. Building general ventilation system must be operable (6 air changes per hour ac/h). ac/h subject to change based on operational experience.</p> <p>8.1e. Periodic O₂ and CO₂ direct monitoring required.</p> <p>Note: Determine if any other off-gas constituents can be expected and plan for accordingly, discuss with Subcontractor.</p>
8.2 TBD		
8.4 TBD	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Load and Transport Treated Soils		Analyzed By/Date:	Reviewed By/Date:
10.0 Principal Step	Potential Hazards	Recommended Controls	
10.1 Walk area down, establish work zone and haul routes.	10.1a. Contact with unexploded ordnance.	10.1a. MK PM to reverify with NSWC the necessity for UXO Survey.	
10.2 Soil load and haul activity.	10.2a. Contact with airborne treated material, may present a biological hazard.	10.2a. Dust Controls required to include covered loads during transport. Level D PPE expected, upgrade if necessary.	
	10.2b. Struck by and struck against physical objects during load and haul operations.	10.2b. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.I by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established.	
10.3 Equipment to be Used	Inspection Requirements	Training Requirements	
10.4 Heavy equipment for loading and hauling.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Off-Load Treated Soils and Site Restoration		Analyzed By/Date:	Reviewed By/Date:
Activity	Original Hazard	Recommended Control	
11.1 Dump and spread	11.1a. Contact with unexploded ordnance.	11.1a. MK PM to reverify with NSWC the necessity for UXO Survey.	
11.2 TBD	11.2a. Contact with airborne treated material, may present a biological hazard.	11.2a. Dust Controls required to include covered loads during transport. Level D PPE expected, upgrade if necessary. Dust controls and respirator (dust mask) may be necessary during spreading and covering with cover material (spray on straw)	
	11.2b. Struck by and struck against physical objects during load and haul operations.	11.2b. Preplan work layout (Work Zone Map completed and posted by Subcontractor). Access and Haul roads to be assessed against EM 385-1-1, Section 21.I by MK onsite PE and Subcontractor supervisors. Backup alarms on all motorized heavy equipment and headlights on (haul trucks only). Emergency procedures and communications with haul trucks must be established.	
Equipment to be Used	Inspection Requirements	Training Requirements	
11.4 Heavy equipment, handtools, sodding equipment, straw spreader, others TBD.	Daily, prior to use per manufacturer's recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, Respirator.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Decontamination Facility Operations, Personnel and Equipment.		Analyzed By/Date:	Reviewed By/Date:
12.0	Principal Steps	Potential Hazards	Recommended Controls
12.1	Receive and place material at facility.	12.1a. Struck by and struck against. Material handling concerns.	12.1a. Site Decontamination Facility to provide isolation and controlled access. MK SSHO and Project Supervisor(s) to review material handling procedures to insure good practices and approved equipment is used which conforms to OSHA and EM-381 Section 28.1 requirements.
12.2	Decontaminate Equipment using high pressure wash or hand scrubbing and/or automatic wash on vehicle tires and undercarriage.	12.2a. Contact with contaminated material and cross contamination; inhalation of airborne aerosols; contact with high pressure wash stream; unexpected movement of material to be decontaminated. 12.2b. Physical hazards associated with process equipment disassembly and dismantlement.	12.2a. Level C PPE with faceshield, modify per SSHO review. Secure items to be decontaminated. Visual inspect integrity of Facility's containment liners and containers used for waste waters. Clean side area established for worker's street clothes and approved respirator storage after cleaning and sanitizing. 12.2b. Decontamination and Decommissioning (D&D) Plan required to include PPE selection, energy control, material handling onsite, and waste management.
12.3	Equipment to be Used	Inspection Requirements	Training Requirements
12.4	High pressure wash with soap solution; other decontamination solutions; scrub brushes; material handling equipment and securing equipment. Personal showers; wash and change facilities.	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication, and Respirator.

Note: Subcontractor D&D Plan required and approved by MK PM and MK Manger of Health and Safety.

ACTIVITY HAZARD ANALYSIS

Activity: Construction of Facility. Note: worksheet can be revised once detailed design and specifications are certified.		Analyzed By/Date:	Reviewed By/Date:
13.0 Principal Steps	Potential Hazards	Recommended Controls	
<p>13.1 Foundation work, structural, component installation, piping, instrumentation, electrical and other ancillary sub-systems.</p> <p>Excavations and Hot Work where necessary.</p>	<p>13.1a. Physical hazards including material handling (struck by, struck against, pinch points, and falls), electrical energy, contact with chemicals used in component installation, combustion sources causing fires, confined spaces, noise, mechanical energy and nonionizing energy.</p> <p>13.1b Excavations</p> <p>13.1c Natural phenomenon hazards</p>	<p>13.1a. Level D PPE modified were necessary depending on job task per MK SSHO direction. Plan of Day meetings to include a tool box safety meeting instead of a pre entry brief (same purpose). MK SSHO to review MK Supervisory Safety Manual, MK Safety Manual, MK IH Manual and EM385-1-1 to plan and implement engineering, administrative and PPE controls. Required programs include but not limited to fire prevention; housekeeping; rigging and lifting; energy control; electrical safety (GFCI on all installations); full fall protection; hearing conservation; hazard communication and emergency preparedness.</p> <p>13.1b. Excavation Permit required.</p> <p>13.1c. Components and structures braced for anticipated loading (wind, snow, earthquake, tornadic) during construction. Final construction must be to local Building Codes, NFPA Fire and Life Safety Code.</p> <p>Note: all process piping and equipment must be labeled per ANSI and OSHA. This includes informational and Cautions and Warnings.</p>	
13.3 Equipment to be Used	Inspection Requirements	Training Requirements	
<p>13.4 Heavy equipment, welding and fastening equipment, electrical and pipe fitting equipment. Material handling equipment (may or may not include cranes), handtools and hand power equipment.</p>	<p>Before use per manufacturers recommendation. GFCIs quarterly. Cranes daily.</p>	<p>OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory and 8 hour Refresher. Note: 1910.120 requirements may be waived for new construction activities only. Site Safety and Health Plan (Project Kick-off), POD, Daily Tool Box in place of Pre Entry Briefs and OSHA Hazard Communication.</p>	

Note: revise sheet prior to design being certified for construction.

ACTIVITY HAZARD ANALYSIS

Activity: Operation of the Rock Wash Basin		Analyzed By/Date:	Reviewed By/Date:
14.0	Principal Steps	Potential Hazards	Recommended Controls
14.1 TBD	14.1a. Rotating or Vibrating Machinery or Pressurized System (TBD).	14.1a. Physical hazards safeguarding on equipment, SOPs in place for operations. Cautions and Warnings labeled on equipment. Powered equipment approved for wet outside location by U.S. rating or listing organization. GFCI protection required.	
14.2 TBD	14.1b. Airborne aerosols; chemical and biological (TBD).	14.1b. Engineering controls in place on equipment (enclosure, ventilation). PPE Level C, downgrade based on air sampling results and operating experience.	
14.3	Equipment to be Used	Inspection Requirements	Training Requirements
14.4	Rock Wash Basin	Before use per manufacturers recommendation.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, OSHA Hazard Communication and Operator Training.

Note: field review and revise sheet as necessary to reflect current conditions.

ACTIVITY HAZARD ANALYSIS

Activity: Start-up Testing and Operational Readiness Review.		Analyzed By/Date:	Reviewed By/Date:
15.0 Principal Steps	Potential Hazards	Recommended Controls	
15.1. TBD	15.1a. Physical hazards, electrical and mechanical energy.	15.1a. Approved Start-Up Plan in place. Approved emergency plans to include response to off-normal equipment and process conditions, especially unexpected personal contamination events.	
	15.1b. Ionizing and nonionizing radiation (may or may not be applicable)	15.1b. Insure correct installation and handling of sensors and verify integrity of sensors. (Again, this may not be applicable but worth mentioning.	
15.2. TBD			
15.3. Equipment to be Used	Inspection Requirements	Training Requirements	
15.4. TBD	Before use per manufacturers recommendation and guidance. Start-up Plan in Place. Safety Walkdown complete and emergency procedures established including all inspections by NSWC governing organizations.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, and OSHA Hazard Communication. May be modified if all clean new construction work.	

Note: complete sheet near construction completion phase in parallel with the Start-up Plan. Start-Up Plan requires MK Health and Safety Managers approval.

ACTIVITY HAZARD ANALYSIS		
Activity: Planned Maintenance during Operations Phase of System.		Analyzed By/Date:
		Reviewed By/Date:
16.0. Principal Steps	Potential Hazards	Recommended Controls
16.1. TBD	16.1a Physical hazards, electrical and mechanical energy. Exposure to contaminants in process equipment.	16.1a Approved O&M Manual in place. Energy Control must be emphasized in procedures. Spare parts must meet or exceed manufacturers recommendation and intended use environment. Preplan any decontamination that may be necessary, either personal and/or equipment. Preplan waste handling and disposal.
16.2. TBD		
16.3. Equipment to be Used	Inspection Requirements	Training Requirements
16.4. TBD	Before use per O&M Manual. Safety Walkdown complete, emergency procedures established and emergency systems tested.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, and OSHA Hazard Communication. May be modified if all clean new construction work.

Note: complete sheet prior to entering Operations Phase. O&M Manual requires MK Health and Safety Managers approval.

ACTIVITY HAZARD ANALYSIS

Activity: Waste Management activities other than those covered under Maintenance.		Analyzed By/Date:	Reviewed By/Date:
17.0. Principal Steps	Potential Hazards	Recommended Controls	
17.1. TBD	TBD	TBD	
17.2. TBD			
17.3. Equipment to be Used	Inspection Requirements	Training Requirements	
17.4. TBD	Before use per O&M Manual. Safety Walkdown complete, emergency procedures established and emergency systems tested.	OSHA 1910.120 40-Hour Training, 3 day OJT, 8 hours Supervisory. 8 hour Refresher, Site Safety and Health Plan (Project Kickoff), POD, Pre and Post Entry Briefs, and OSHA Hazard Communication. May be modified if all clean new construction work.	

Note: complete sheet prior to entering Operations Phase. O&M Manual requires MK Health and Safety Managers approval.

APPENDIX B

WORK ZONE MAPS

(Maps to be developed as necessary)