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WORK PLAN FOR GROUNDWATER TREATMENT FACILITY NIROP FRIDLEY MN
9/12/1997
MORRISON KNUDSEN CORPORATION

26

Work Plan

Ground-Water Treatment Facility

**NAVAL INDUSTRIAL RESERVE ORDNANCE
PLANT
FRIDLEY, MINNESOTA**



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**

Contract #N62467-93-D-1106

Delivery Order #0039

Statement of Work #047

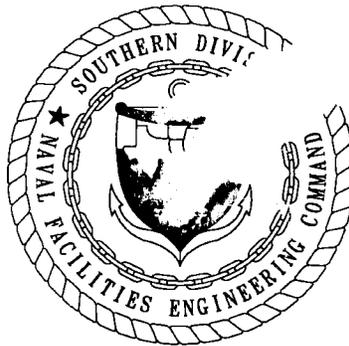
September 12, 1997

Revision #0

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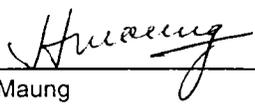
Prepared For:

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
P. O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

Prepared by:

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

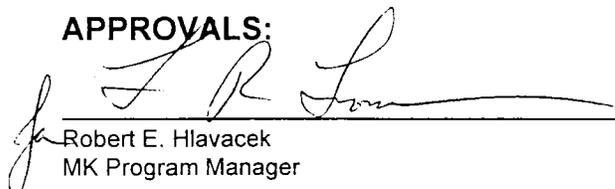
PREPARED/APPROVED BY:



Han Maung
MK Project Engineer

9/12/97
Date

APPROVALS:



Robert E. Hlavacek
MK Program Manager

9/17/97
Date

CLIENT ACCEPTANCE



U.S. Navy Responsible Authority

3/23/98
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ACRONYMS

AHA	Activity Hazard Analysis
ASU	Air Stripping Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COD	Chemical Oxygen Demand
DFOW	Definable Feature of Work
GAC	Granular activated carbon
gpm	Gallons per minute
GWTF	Ground-Water treatment facility
HCL	Hydrochloric acid
HNO ₃	Nitric acid
MCC	Motor control center
mg/l	Milligram per liter
MK	Morrison Knudsen Corporation
ml	Milliliter
MPCA	Minnesota Pollution Control Agency
MWCC	Metropolitan Waste Control Commission
MSDS	Material safety data sheets
NEESA	Naval Energy and Environmental Support Activity
NIROP	Naval Industrial Reserve Ordnance Plant
NPDES	National Pollution Discharge Elimination System
OU1	Operable Unit Number One
O&M	Operations and maintenance
PLC	Programmable logic controller
PM	Project Manager
PMO	Program Management Office
POTW	Publicly owned treatment works
ppb	Parts per billion
PPE	Personal protective equipment
PWO	Public Works Officer
REICC	Resident Engineer In-Charge of Construction
ROD	Record of Decision
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SQCS	Site Quality Control Supervisor
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TSS	Total Suspended Solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

1.1 BACKGROUND

This Work Plan has been prepared by Morrison Knudsen Corporation (MK) for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), under contract number N62467-93-D-1106, Delivery Order 0039, Statement of Work 047.

Naval Industrial Reserve Ordnance Plant (NIROP) at Fridley is located near the twin cities of Minneapolis and St. Paul, Minnesota. As shown in Figure 1-1, the site is approximately 1,000 feet east of the Mississippi River and less than 1 mile south of Interstate 694. It lies on a broad, flat outwash terrace, and is largely covered by pavement, structures, and other facilities. Out of the total plant size of 138 acres, the federal government owns 83 acres which are operated by United Defense. The remaining 55 acres are owned and operated by United Defense.

The plants at NIROP began producing Naval guns in 1941. Later, they were diversified into the production of guided missile launching systems, various weaponry and hydraulic and electric power drive and control systems.

1.2 OBJECTIVES

This Work Plan provides a brief description for the removal of an existing pilot air stripping unit (ASU) and installation, construction and start-up of a new ground-water treatment facility (GWTF). The work is being undertaken in accordance with the Record of Decision (ROD) for Operable Unit Number One (OU1). The operations and maintenance of the GWTF is beyond the scope of this work plan.

Currently, the existing ASU is not used, and ground water pumped from the extraction wells is discharged directly into the sanitary sewer for further treatment at publicly owned treatment works (POTW). The objective of the work described in this Work Plan is to treat the ground water on-site using a new GWTF. The treated effluent will be discharged through existing outfalls to the Mississippi River under an existing National Pollution Discharge Elimination System (NPDES) permit.

1.3 DESCRIPTION OF EXISTING FACILITY

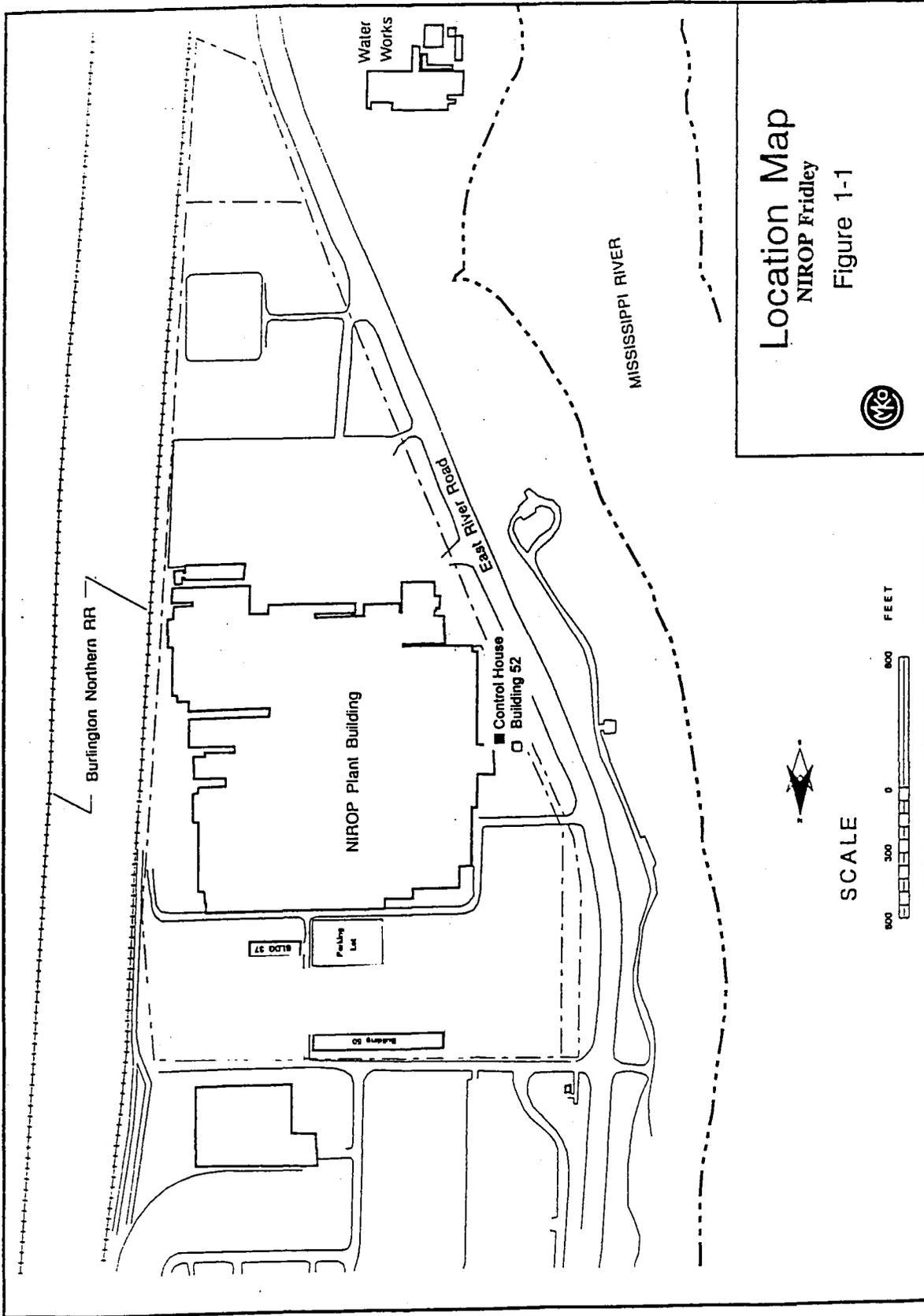
The existing pilot pre-treatment system was installed, in accordance with the ROD, to pump and treat a plume of impacted ground water at the site. The work was performed under the direction of U.S. Army Corps of Engineers (USACE) - Omaha District in September 1992. The major components of the system are:

Four ground-water extraction wells (designated AT-1A, AT-2, AT-3A, and AT-4)

- A Control House (Building 53) where the four extraction well pipelines are brought together into a common manifold
- A pre-engineered ground-water treatment building (Building 52) containing a packed column-type ASU with a gas-phase granular activated carbon (GAC) unit for removing volatile organic compounds (VOCs) from the ASU exhaust

In March 1995, the ASU in Building 52 was taken out of service and the ground water was discharged from the extraction wells directly to the sanitary sewer, because VOC concentrations in the ground water were consistently below the POTW pre-treatment standards.

In June 1995, two extraction wells (AT-5A and AT-5B) were added to improve the effectiveness of capturing the plume.



Location Map
 NIROP Fridley
 Figure 1-1

2.0 ENVIRONMENTAL COMPLIANCE

2.1 REGULATORY COMPLIANCE

The scheduled installation and construction actions will be conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A ROD for implementation of a ground-water remediation system was signed in 1990 by representatives of the U.S. Navy, the United States Environmental Protection Agency (USEPA) - Region V, and the Minnesota Pollution Control Agency (MPCA).

The installation and construction of the ground-water treatment system will be performed in accordance with all construction industry codes and standards, including:

- 29 CFR 1926, "Safety and Health Regulations for Construction"

Work in hazardous or potentially hazardous waste areas will be performed in accordance with all applicable codes and standards including, but not necessarily limited to, the following:

- 40 CFR 261, "Hazardous Waste Identification and Listing"
- 40 CFR 262, "Standards Applicable to Generators of Hazardous Waste"
- 40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste"
- 40 CFR 268, "Land Disposal Restrictions"
- 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response"
- 49 CFR 173, "Shippers - General Requirements for Shipments and Packaging"
- Minnesota Regulations Chapter 7045 - "Hazardous Waste"
- Minnesota Regulations Chapter 7035 - "Solid Waste"

2.2 PERMITS, APPROVALS, AND NOTIFICATIONS

The modifications to existing NPDES permit will be performed by the Navy and completed prior to start of construction.

An excavation permit will be required for any of the work specific to trenching, drilling and digging. The locations will be provided to the NIROP Fridley Facilities Maintenance Department to obtain the necessary utility clearances. Hot work permits will be issued on an as needed basis.

3.0 PROJECT ORGANIZATION

Table 3-1 summarizes the key parties involved with the work activities covered by this Work Plan and their responsibilities.

TABLE 3-1 PROJECT RESPONSIBILITIES	
Team Member(s)	Responsibilities
SOUTHNAVFACENGCOM	Overview of project execution and coordination between MK, NIROP site and regulatory agencies.
Navy Resident Engineer in-Charge of Construction (REICC)	SOUTHNAVFACENGCOM's on-site representative who is the liaison between NIROP personnel and the MK Project Manager.
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 SOUTHNAVFACENGCOM.
Project Manager (PM)	<p>Overall responsibility for implementing this Work Plan and all other project activities. The Project Manager will control all on-site forces to ensure completion of project tasks.</p> <ul style="list-style-type: none"> • Provides single point of contact for 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 PMO
Project Engineer	<ul style="list-style-type: none"> • Responsible for development of this Work Plan and Statement of Work for Subcontractors • Evaluate Subcontractor proposals • Participates in pre-construction meetings and post-construction inspections • Responsible for developing the Completion Report
Construction Superintendent	<ul style="list-style-type: none"> • Responsible for coordination and control of all field activities to ensure that all tasks included in the Work Plan are completed • Directs and coordinates the subcontractor activities • Provides daily reports to the PM on the status of field activities

**TABLE 3-1 (Continued)
PROJECT RESPONSIBILITIES**

Team Member(s)	Responsibilities
Field Engineer	<ul style="list-style-type: none"> • Responsible for revising engineering plans and scope of work • Responsible for preparing the engineering portion of the contract change notices • Secure approvals of design drawings, specifications and other information • Responsible for preparation of start-up and operations • Responsible for preparation of Operations and Maintenance Manual
Site Safety and Health Officer (SSHO)	<p>Reports to the PMO. Implements and ensures compliance with the Site-Specific 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, and 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

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**TABLE 3-1 (Continued)
PROJECT RESPONSIBILITIES**

Team Member(s)	Responsibilities
<p>Site Quality Control Supervisor (SQCS)</p>	<p>Reports to the PMO and has primary responsibility for verifying a consistently high level of quality for the project. Implements and ensures compliance with the Quality Control Plan and other planning documents, as applicable.</p> <ul style="list-style-type: none"> • Reviews and checks all documents, reports, and testing results • Reports all inspection/test results to PMO and others as required • Coordinates with procurement, engineering, and cost/schedule departments • Observes all field activities to ensure compliance with this Work Plan and completes Field Inspection Checklists • Keeps minutes of the periodic quality meetings • Performs required tests and implements the three phases of quality control: Preparatory, Initial, and Follow-up inspections • Ensures tracking and resolution of nonconformance/rework items • Stops work when work does not comply with requirements established contractually • Supervises the Quality staff, as applicable • Assists the Program Quality Manager in the submittal process • Maintains the Testing Plan and Log • Documents results of inspection and testing activities on the Contractor Quality Control Report • Ensures that sample custody requirements are maintained
<p>Construction Inspector</p>	<ul style="list-style-type: none"> • Responsible for performing inspection of all activities performed by the Subcontractor • Provides daily inspection reports to the Construction Superintendent

4.0 PROJECT EXECUTION

4.1 WORK APPROACH

This section describes the work approach that will be employed during the installation and construction activities. The work approach addresses the control of work process, work elements, and regulatory and reporting requirements associated with the work activities.

The descriptions are based on the information provided in the following reports:

- *Workplan for Improvement of Ground-Water Containment System* [RMT, 1995]
- *Approved Plans and Specifications* [RMT, 1997]

The information provided in this Work Plan is a summary of the proposed work. Detail descriptions and drawings are contained in the design documents developed by RMT [RMT, 1997].

4.2 DEFINABLE FEATURES OF WORK

The general sequence of the work can be broken down into definable features of work (DFOWs). DFOWs and the Three Phases of Control will be used to maintain Quality Control over the work at the site. The DFOWs, shown below and described briefly in the following sections, are the basic elements associated with the work activities:

- Site preparatory work
- Removals and existing facility modifications
- Equipment installation
- Underground piping and utilities
- Electrical system and instrumentation
- Controls system
- Operational start-up
- Sampling and analysis
- Waste management
- Regulatory compliance
- Reports

4.2.1 Site Preparatory Work

Site preparatory work is the first physical activity at the site and involves the staging of material and equipment, demarcation of work zones, and lockout/tagout of the existing equipment. The coordination, scheduling of work activities with the various plant operations and pre-construction conference will also be performed during the site preparation.

4.2.2 Removals and Existing Facility Modifications

Removals and modifications to the existing facilities are identified below:

Control House

- Removal of inside piping, valves, and backflow preventer
- Removal of window on south building wall (for new piping penetrations)
- Removal of one unused GAC canister located across the Control House

Building No. 52

- Removal of air ducts and GAC unit exhaust stacks (2)
- Removal of all equipment, including:
 - One packed-column type ASU
 - One blower
 - One electric process air heater
 - One used gas-phase GAC canister to be disposed of as hazardous waste
 - One floor-mount electrical control panel
 - Removal of inside piping, valves, and conduits
 - Repair and replace roof and wall resulting from removal of equipment

Prior to removal, the interior of the piping, valves and the ASU, will be cleaned by pumping potable water. Water from the cleaning operation will be discharged to the sanitary sewer at the site. Salvageable materials, such as piping, valves, unused GAC canister and the ASU will be transported to Building 51 for storage. Construction debris will be disposed of at an off-site facility. The disposal of used GAC canister is not included in the scope of work.

A building will be constructed to connect the control house and Building 52. A sewer discharge pipe clean-out connection will be constructed in Building 52 as shown in Figure 4-1. The cross-connections of influent pipelines will be disconnected at two locations and blind flanges will be installed to cooling water pipelines in the NIROP building.

4.2.3 Equipment Installation

The major components of the new treatment system will include:

- Feed system
- Air stripping units
- Effluent sump with effluent pump
- Pipeline flushing system
- Chemical cleaning system

A brief description of the new equipment is provided below.

4.2.3.1 Feed System

The feed system consisting of an equalization tank and feed pumps will be installed in Building 52 after removal of all the equipment identified in Section 4.2.2.

The equalization tank will be provided to collect ground water from the existing extraction wells. The equalization tank will be a steel tank with a capacity of approximately 7,725 gallons. Sight glasses will be mounted on the side for monitoring the liquid level in the tank.

Two centrifugal feed pumps will be installed to transport ground water from the equalization tanks to the ASUs. The capacity of each pump will be 1,100 gallons per minute (gpm).

An automatic controls system will be installed to adjust the flowrate from the feed pumps to between 50 and 100 gpm above the inflow rate to the equalization tank. A line will be provided off the feed pump discharge equipped with a level-control valve with an automatic open-door actuator. The valve will open at a preset low level in the equalization tank and will close when the water level reaches a preset high point.

4.2.3.2 Air Stripping Units

Four ASUs will be installed inside the existing NIROP building along the north building wall. Based on air emissions risk modeling performed by RMT, the exhaust air from the units will be discharged directly to the atmosphere without air treatment [RMT, 1997]. Each low profile, tray-type ASU shall include the following components:

- An air blower - a separate air inlet duct will be provided to bring outside air into the blower
- A cleaning solution recirculation pump
- Factory installed piping, conduit/wire and instruments
- An eight-inch diameter gravity outlet pipe

Each ASU will be designed to treat 250 gpm at the maximum VOC concentration, while producing treated ground water that meets the required effluent criteria, as provided in Table 4-1.

Each ASU will be mounted on a skid and each skid will be constructed of heavy duty carbon steel frames provided with fork lift slots or channels to facilitate unloading and installation.

4.2.3.3 Effluent Sump and Effluent Pump

A reinforced concrete sump will be constructed inside the NIROP building. The effluent from the ASUs will discharge by gravity to the sump. The approximate dimensions of the sump are 12-feet by 14-feet.

Two effluent pumps will be installed to allow the return of treated water to Building 52 where it will be directed to a connection to an existing 72-inch storm sewer. One of the pumps is for the required operation and the other as standby. Each pump will be designed to pump at 1,100 gpm. Blowback and an automatic-level control valve will be installed so that the flowrate from the effluent pump exceeds the flow rate into the sump by 50 to 100 gpm.

4.2.3.4 Pipeline Flushing System

The pipeline flushing system, consisting of a wastewater tank and a blowdown pump, will be provided for periodic flushing of the extraction well pipelines. The wastewater tank and blowdown pump will be installed in Building 52. The wastewater tank will be made of carbon steel and have a capacity of 4,300 gallons of liquid. The blowdown pump will be a submersible electric pump that will provide a flowrate of 50 gpm at 20 feet of total head. A portable air compressor will be provided to flush the pipeline from the extraction wells.

4.2.3.5 Chemical Cleaning System

The chemical cleaning system will be installed to remove scale from the trays in the ASUs. The chemical cleaning system will include the equipment shown in Table 4-2. The system will allow circulation of a ten-percent Hydrochloric Acid (HCL) solution through the trays of the ASUs for cleaning. A filter press will be provided to separate solids in the spent solution.

4.2.4 **Underground Piping and Utilities**

Underground piping will be installed to convey treated and untreated ground water. The following underground piping and utilities will be constructed on the west side of NIROP Building:

- One ten-inch diameter untreated ground-water force main
- One ten-inch diameter treated ground-water force main which will be connected to the existing 72-inch storm sewer south of Building 52
- Three two-inch diameter electric conduits

The existing extraction wells or the piping from the well head to the control house will require no modification.

Prior to underground construction, the location of the existing utilities will be surveyed and marked. A temporary decontamination area will be used to clean construction equipment involved in the earthwork. The exteriors of these pieces of equipment will be cleaned prior to the start of construction and after construction is completed. Cleaning will be performed using high-pressure/low-volume water with detergent.

The underground piping and utilities will be installed using a combination of trenching and jacking. Jacking will be the preferred method of construction below certain existing pavements and the railroad tracks. The excavated soil will be used as backfill material. Any excess excavated soil will be spread and graded in the North 40 area.

Any pavement that is cut and removed during construction will be replaced. The replaced pavement and base course material will conform to existing construction.

4.2.5 Electrical System and Instrumentation

The electrical system and instrumentation will be modified and installed in each of the three buildings as discussed below.

4.2.5.1 NIROP Building

A motor control center (MCC) will include the various breakers and standard and soft-start motors. Conduit and cabling will be installed between a new 400-amp breaker busway plug and the MCC. A meter for the power feed to the treatment area will also be provided.

4.2.5.2 Control House (Building 53)

Power to the control panel will be provided from the existing power source in the Control House. The existing transformer will be raised approximately four feet and will be wall-mounted.

4.2.5.3 Building 52

A new breaker will be installed at the existing plant Substation No. 9, Cubical A4B, which will serve as power source for Building 52. Underground conduits will be installed to connect the power source to a new distribution panel installed within Building 52. A meter for the power feed will be provided. Individual motor starters will be mounted along the Building 52 inside wall.

4.2.6 Controls System

A control room will be constructed inside the NIROP building. A control panel with a programmable logic controller (PLC) and a remote input/output (I/O) rack will be installed in the control room. A personal computer will be provided to monitor the operations of the GWTF. Interconnections will be made between the existing control panel in the control house and the new control panel located in NIROP Building.

An alarm status will be activated when operating parameters are exceeded. A summary of the conditions that would activate an alarm status is provided below.

- Freezing temperatures in the control house
- "High-high level" in the equalization tank will initiate automatic shut down of all extraction wells
- Failure of on-line GWTF feed pump motor will initiate automatic shut down of all extraction wells

- Any of the following conditions will initiate shutdown of the blower of the affected ASU:
 - Low inlet pressure
 - High inlet air pressure
 - Low differential air pressure across the trays
 - High differential air pressure across the trays
 - Blower motor failure
 - Stripping unit tank high level
- "High-high level" in the central floor sump will initiate automatic shut down of all extraction wells
- Failure of an effluent pump will initiate automatic shut down of all extraction wells and GWTF
- High levels in cleaning solution tank or cleaning solution neutralization tank
- Failure of HCL, cleaning solution or cleaning solution decant pumps
- Failure of the pipeline flushing blowdown pump motor

4.2.7 Operational Start-Up

After installation of the GWTF, a system checkout will be performed and a punchlist will be prepared. Performance testing will be performed to ensure that all components are functioning within the specified ranges. All flowmeter transmitters will be checked and calibrated during start-up. Training will also be provided to personnel who will be involved in the daily operations of the GWTF. An Operations and Maintenance (O&M) Manual will be prepared for the GWTF following completion of system start-up.

The effluent will be discharged to the sanitary sewer until the laboratory results indicate that the NPDES criteria has been met.

4.2.8 Sampling and Analysis

Sampling, sample handling and storage, chain-of-custody, and laboratory and field analyses will be performed in accordance with NEESA 20.2-047B - *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program* [NEESA, 1988].

Samples of the influent and effluent liquid will be collected during the start-up to determine the efficiency of the GWTF and to allow discharge of the effluent to the storm sewer in accordance with the NPDES permit. Analytical method, preservation, and holding time requirements are also provided in Table 4-3. Samples will be analyzed by a laboratory certified by the Minnesota Department of Health as provided by Minnesota Rules 4740.2040, Certified Test Categories.

If the effluent is to be discharged to the sanitary sewer, additional samples will be collected per Metropolitan Waste Control Commission (MWCC) permit. These samples will be analyzed for determination of:

- Chemical Oxygen Demand (COD), in accordance with EPA Method 410.4, and
- Total Suspended Solids (TSS), in accordance with EPA Method 160.2.

4.2.9 Waste Management

A Waste Management Plan, included as Appendix D, provides a list of wastes expected to be generated and a description of how they will be managed.

4.2.10 Regulatory Compliance

To assure compliance with federal, state and local regulations, a Quality Control checklist has been developed to verify that the applicable regulations have been addressed. The Regulatory Compliance checklist (RG-01), included in Appendix B, requires the SQCS to review other specific checklists and

verify that regulatory requirements have been met prior to proceeding with a DFOW.

4.2.11 Reports

MK will generate and submit a Completion Report to SOUTHNAVFACENGCOM after all site activities are completed. The report will include:

- A summary of installation and construction activities completed
- A summary of description of the major equipment components
- A summary of wastes generated, managed and disposed
- Photographic documentation of site conditions before, during, and after work activities
- As-Built record drawings
- A discussion of any deviations from the Work Plan with results
- Final acceptance of work activities by the REICC
- Lessons learned
- Project conclusions

**TABLE 4-1
DESIGN CRITERIA FOR AIR STRIPPING UNIT**

Compound	Design Maximum Concentration (ppb)	Effluent Limit* (ppb)
Trichloroethene	3,000	5
1,2-dichloroethene (total)	200	170
Acetone	60	NL
Methylene chloride	40	5
Tetrachloroethene	5	3.8
1,1-dichloroethane	10	70
1,1-dichloroethene	5	6
<u>Note:</u> * NPDES Permit Limit NL = No limit		

**TABLE 4-2
EQUIPMENT FOR CHEMICAL CLEANING SYSTEM**

Equipment	Quantity	Capacity	Type	Special Construction Material/Requirements
Cleaning solution tank	1	3,000 gallons	Vertical	Cross-linked polyethylene
Cleaning solution neutralization tank	1	3,000 gallons	Vertical	Cross-linked polyethylene
Filter press	1	8 cu ft	Plate and frame pressure	Manual plate movement
HCL pump	1	25 gpm	Electric, centrifugal	To pump 31% HCL concentration
Cleaning solution pump	1	67 gpm	Electric, centrifugal	To pump 10% HCL concentration
Filter press feed pump	1	50 gpm	Compressed air, double-diaphragm	To pump iron and manganese hydroxide sludge
Cleaning solution recirculation pump	4	178 gpm	Electric, centrifugal	To pump 10% HCL concentration
Alkali mix tank	1	250 gallons	Vertical	Cross-linked polyethylene
Alkali pump	1	20 gpm	Compressed air, double-diaphragm	To pump 20% calcium carbonate slurry

**TABLE 4-3
ANALYTICAL PARAMETERS**

Compound	Analytical Method	Container Type	Preservation & Holding Time
Volatile Organic Compounds (VOC)			
Methylene Chloride	EPA 601	2 x 40 ml Glass with teflon septa	Cool to 4°C (no headspace), 14 days
Carbon disulfide			
1,1 dichloroethene			
1,1 dichloroethane			
1,2 dichloroethene (cis)			
1,2 dichloroethene (trans)			
Trichloroethene			
Tetrachloroethene			
Metals			
Iron	SW-846 6010A	500 ml Glass	HNO ₃ to pH<2, 6 months
Manganese			
Copper			
pH	EPA 150.1	50 ml Glass	Cool to 4°C Analyze immediately
Notes: 1. VOC samples will be collected twice monthly for the first year. 2. Samples for iron and manganese will be collected quarterly. 3. Samples for copper will be collected monthly.			

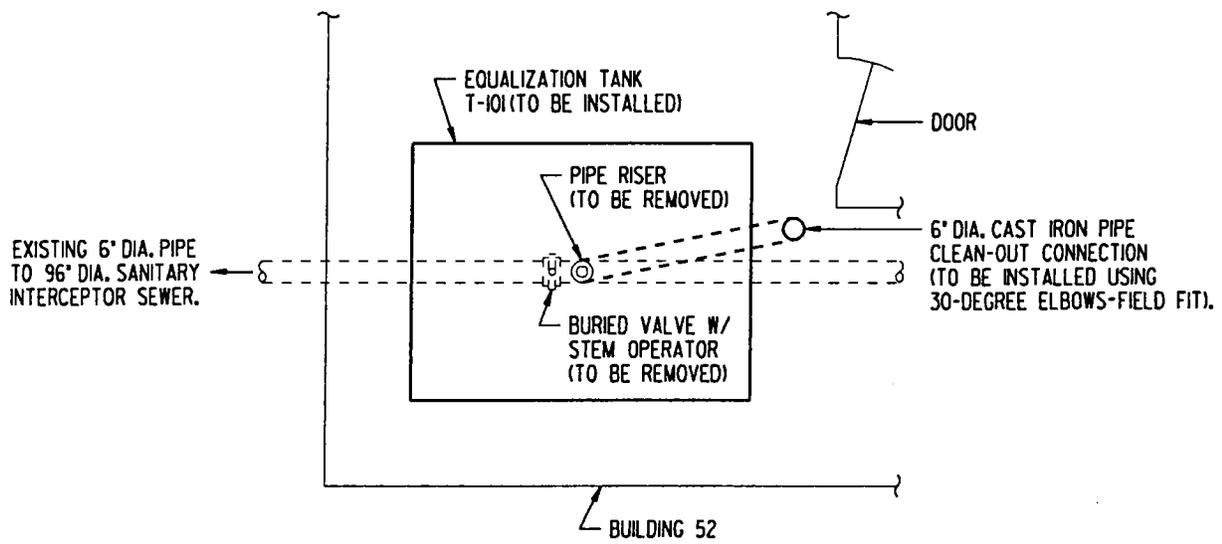


Figure 4-1
SEWER DISCHARGE PIPE CLEAN-OUT CONNECTION

5.0
SITE SAFETY AND HEALTH PLAN

The Site Safety and Health Plan (SSHP) is contained in Appendix A to this Work Plan.

6.0 QUALITY CONTROL

6.1 QUALITY CONTROL REQUIREMENTS

The Quality Control requirements, specified in this section supplement, are to be used in conjunction with the requirements of the Delivery Order Execution Quality Control Plan previously approved by SOUTHNAVFACENGCOM [MK, 1996].

6.2 INSPECTION SYSTEM

MK will use the DFOWs and the Three Phases of Control to ensure that work activities at the site achieve and maintain a consistently high level of quality.

At each phase -- Preparatory, Initial and Follow-Up -- quality control verification activities may be supplemented by the performance of detailed inspections of a particular activity. Field Inspection Checklists, included in Appendix B, will be used to assure a thorough verification of the work process. When utilized, the completed Field Inspection Checklist is attached to the combined *Contractor Production Report/ Contractor Quality Control Report (Form 01400-1)*, which is completed on a daily basis.

6.3 TESTING PLAN AND LOG

A Testing Plan and Log has been prepared and is included in Appendix B of this Work Plan. The Testing Plan and Log delineates the required tests and inspections applicable to a definable feature, as well as the inspection checklist or governing standard to be used in the performance of the inspection. The Testing Plan and Log will be utilized in the field to record the status of sampling and inspections performed. The SQCS will attach a copy of the updated Testing Plan and Log to the last daily Contractor Quality Control Report of each week.

6.4 REQUIRED QUALITY CONTROL DOCUMENTATION

Table 6-1 cross references each DFOW as it relates to applicable Field Inspection Checklists and Activity Hazard Analysis (AHA). Field Inspection Checklists that are to be completed to support the work activities are included in Appendix B.

6.5 FINAL SITE INSPECTION

Following substantial completion of installation and construction activities, a final inspection will be performed by the REICC and MK SQCS. If any work item is not in compliance with this Work Plan, a punchlist will be generated by the MK SQCS. All punchlist items will be corrected to the requirements of the Work Plan. Upon acceptance of the work activities, a Certificate of Satisfactory Completion will be signed by all parties involved in the final inspection. A typical certificate of satisfactory completion is included in Appendix B.

**TABLE 6-1
DFOW CROSS REFERENCE**

DFOW	Work Plan Section	Activity Hazard Analysis (Appendix A)	Field Inspection Checklist(s) (Appendix B)
Site Preparatory Work	4.2.1	1 of 8	SP-01
Removals and Existing Facility Modifications	4.2.2	2 of 8	RE-01
Equipment Installation	4.2.3	3 of 8	ME-01; CO-01
Underground Piping and Utilities	4.2.4	4 of 8	EX-01; BF-01 PI-01; DE-01
Electrical System and Instrumentation	4.2.5	5 of 8	EI-01
Controls System	4.2.6	N/A	N/A
Operational Start-Up	4.2.7	6 of 8	OP-01
Sampling and Analysis	4.2.8	7 of 8	SA-01
Waste Management	4.2.9	8 of 8	WM-01
Regulatory Compliance	4.2.10	N/A	RG-01
Reports	4.2.11	N/A	N/A
Note: N/A = Not applicable			

7.0 SCHEDULE

Work activities described in this Work Plan will be performed in two phases. The first phase will include removals and modifications to existing treatment system in buildings 52 and 53. The schedule for the first phase is provided in the following page and the milestones are listed below:

Pre-construction Meeting	September 18, 1997
Field Mobilization	September 25, 1997
Complete Construction	December 19, 1997
Start-up and Testing	January 16, 1998
Demobilization	January 29, 1998

The second phase will comprise of the remainder of the work, which be scheduled after completion of the first phase.

8.0 REFERENCES

RMT, Inc., January 1995. *Workplan for Improvement of Ground-Water Containment System*. [RMT, 1995]

RMT, Inc., June 1997. *Approved Plans and Specifications*. [RMT, 1997]

US Army Corps of Engineers, October 1992. *Safety and Health Requirements Manual*. EM 385-1-1. [ACOE, 1992]

Naval Energy and Environmental Support Activity, June 1988. *Sampling and Chemical Analysis Quality Assurance Requirements for the Navy Installation Restoration Program*. NEESA 20.2-047B. [NEESA, 1988]

Morrison Knudsen Corporation, July 12, 1996. *Delivery Order Execution Quality Control Plan*, Southern Division, Naval Facilities Engineering Command. [MK, 1996]

APPENDIX A
SITE SAFETY AND HEALTH PLAN

APPROVAL: William Purpurnen **Date:** 9/15/97
MK PMO Health and Safety Manager

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1.0 SITE SAFETY AND HEALTH PLAN

This Site Safety and Health Plan (SSHP) describes safety and health requirements for the installation and construction of a Ground-Water Treatment Facility (GWTF) at the NIROP facility. Also included are tasks associated with the removal of existing equipment and existing facility modifications. Safety and health requirements for start-up and operations will be included in the Operation and Maintenance (O&M) Manual. This SSHP, together with the MK General Safety and Health Plan (GSHP) [MK, 1996c], 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 along with the U.S. Army Corps of Engineers' *Safety and Health Requirements Manual* EM 385-1-1, [ACOE, 1996]. This SSHP is applicable to all personnel who enter into work areas described in this SSHP and who are under the control of MK or its Subcontractor.

1.1 CONTAMINANT CHARACTERISTICS

No sources of soil contamination are known or suspected to exist within the planned excavation areas. During removal of inside piping, valves, and conduits, the potential for contact with residual untreated ground-water containing low levels of chlorinated hydrocarbons is unlikely since the system will be flushed with potable water. Generally, these compounds if ingested, inhaled, or contacted can cause central nervous system (CNS) depression, poor equilibrium, and dermatitis. Precautions include preventing eye and skin contact and respiratory protection if action levels are reached. First aid for exposure includes soap and water wash for skin, immediate irrigation for eye contact and removal from exposure. Respiratory support and medical attention will be sought immediately.

Material Safety Data Sheets (MSDS) for chemical compounds anticipated for use during construction of the facility will be reviewed prior to use by the MK SSHO, and determination of proper controls for its use will be made and reviewed with workers. The MK SSHO will maintain an MSDS logbook on site and provide access to all personnel. Training on the safe use of any support chemicals will be conducted by the MK SSHO and supervisory personnel.

1.2 SAFETY AND HEALTH HAZARDS SUMMARY

All existing ground-water treatment systems will be flushed prior to dismantling and assessed for energy control. Lock-out and Tag-outs will be installed where necessary. All hoisting and rigging equipment will be inspected by a Competent Person prior to use. Use of existing facility traveling bridge cranes requires a United Defense certified operator. Prior to use, MK will obtain a copy of the copy current crane inspection. All lifts will be preplanned by a Competent Person, including the calculation of safe loading. Unprotected floor openings will be guarded with temporary barriers prior to installation of more permanent guards as part of a 100% fall protection program. Walking and working surfaces will be monitored for fall and slip hazards, and approved barriers and signs will be placed for pedestrian safety. Level D Personal Protective Equipment (PPE) is anticipated for the majority of the tasks. Hearing protection devices may be required on selected construction tasks. Modified Level D PPE may be required when using some of the support chemicals in construction of the new treatment facility and during completion of certain construction tasks. PPE requirements are specified in Section 1.6.

1.2.1 Activity Hazards Analysis (AHA)

AHAs have been prepared for each anticipated task in accordance with EM 385-1-1, [ACOE, 1996]. AHAs are in the form of worksheets contained in Attachment A of this Appendix. Each site activity will be reviewed by field supervisors, namely the MK SSHO, MK Site Project Manager (PM) and Subcontractor Job Supervisors and affected personnel prior to starting work, to determine if the prepared AHA

adequately addresses the planned activity. If the prepared AHA requires revision or a new task is identified, additional AHA worksheets will be prepared as needed. The AHA worksheet will be redlined, or a new AHA worksheet will be field prepared by the Subcontractor Job Supervisor and the MK SSHO before the activity takes place.

1.2.2 Excavation Safety

Prior to installation of the new conveyance system, the location of the existing utilities and process piping will be surveyed and marked by MK's Subcontractor, and an excavation and trenching permit will be completed by the MK SSHO and coordinated through the Resident Officer In-Charge of Construction (ROICC). Management of the excavation safety program for this project will be established during mobilization, communicated to all affected parties at the pre-construction meeting, and managed by the MK SSHO using guidelines established in MK Program Procedure PHSP 05.1. This procedure is included in the *Program Procedures Manual* which will be available on site [MK, 1996d].

1.2.3 Utilities and Process Piping

Where necessary, the existing system will be energy controlled prior to initiating dismantling activities. Locks and tags will be applied by MK's Subcontractor and coordinated through the ROICC. Management of the energy control program for this project will be established during mobilization, communicated to all affected parties at the pre-construction meeting, and managed by the MK SSHO using guidelines established in MK Program Procedure PHSP 01.1. This procedure is included in the *Program Procedures Manual* which will be available on site [MK, 1996d].

1.2.4 Fire and Explosion

No hot work or open flames will be allowed in the work area without a Hot Work Permit. This permit will be issued by the MK SSHO and coordinated with the ROICC. At least one 20-lb or equivalent ABC multi-purpose fire extinguisher will be maintained for fire response near each work zone during hot work activity.

1.2.5 General Motor Vehicle, Hand and Power Equipment Safety

Refer to GSHP Section 2.5.8 for motor vehicle and equipment safety inspection requirements.

1.2.6 Work Site Control Safety

Approved barricades and signs will be placed around work areas in accordance with GSHP Section 2.5.9. Special attention will be given to ensuring pedestrian safety around work areas inside and outside of buildings. Unprotected floor openings will be guarded with temporary barriers as part of a 100% fall protection program in accordance with OSHA 1926 Subpart M.

1.2.7 Hoisting and Rigging

A Competent Person will be designated for all hoisting and rigging, and equipment will be inspected prior to use per OSHA 1926.251. The Competent Person will calculate the load weight of equipment prior to rigging to determine safe working loads for the specific application. It is anticipated that the existing building bridge cranes will be used to hoist and remove or install equipment. Use of building cranes will be coordinated through United Defense. Only a United Defense certified operator will operate the crane. The MK SSHO will obtain a copy of the current crane inspection certification prior to authorizing its use.

1.3 RESPONSIBILITIES AND AUTHORITIES SUMMARY

Ultimately, responsibility for the safety and health lies with the individual. All personnel must be cognizant of the 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 which may jeopardize the welfare of project workers and/or the general public. The specific personnel names and telephone numbers of responsible persons are presented in Table A-1 which includes directions to the nearest medical facility. Figure A-1 is the map showing routes to the nearest medical facility. Refer to the GSHP, Section 3.0, for a summary on responsibilities and authorities. Planned MK staffing includes a PM, an SQCS, and an SSHO.

1.4 SAFETY TRAINING AND MEETING REQUIREMENTS SUMMARY

All regulatory and project specific training and meetings for this project are summarized in Table A-2. Clean construction (involves no hazardous substances) and existing facility dismantling will not be classified as HAZWOPER per OSHA, 29 CFR 1910.120 and 1926.65, however, these operations will be conducted consistent with EM 385-1-1. Facilities start-up and operations personnel will require HAZWOPER training certification.

1.5 MEDICAL PROGRAM SURVEILLANCE PROGRAM REQUIREMENTS

Participation in a medical surveillance program in accordance with OSHA, 29 CFR 1910.120 and 29 CFR 1926.65 is not required for clean construction and existing facilities dismantling. If respiratory protection is required for any tasks, personnel must be medically cleared per 29 CFR 1910.134. Facility operations personnel will require participation in a medical surveillance program consistent with HAZWOPER regulations.

1.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Refer to Table 4 in the GSHP document for the definition of the basic levels (Level B, C, Modified D, and D) of PPE. Table A-3 lists the minimum PPE level required for each task or operation. The majority of the tasks will be completed in Level D (standard work attire) PPE with upgrades that may include special gloves, hearing protection, face shields, and other protective clothing on an as needed basis. The MK SSHO is empowered with the authority to authorize any modification to the PPE requirements based on air sampling and/or monitoring or by professional judgement.

1.7 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. MK's Subcontractor is responsible for supplying one flame ionization detector (FID) and one combustible gas indicator (CGI)/ oxygen (O₂) meter as described in subsections 1.7.1 and 1.7.2. It is anticipated that use of these instruments will only be needed if permit required confined space entries are necessary. Execution of real-time air monitoring will be coordinated by the MK SSHO.

1.7.1 Volatile Organic Compounds

A direct-reading, real-time FID instrument capable of detecting VOCs will be used whenever confined space entry is planned. Calibration checks and records management will be performed per GSHP Section 7.2.1.

1.7.2 Combustible Gas and Oxygen Monitoring

A direct-reading, real-time combination instrument capable of measuring percent Lower Explosive Level (LEL) and percent of oxygen (O₂) will be used whenever confined-space entry is planned. Calibration checks and records management will be performed per GSHP Section 7.2.3.

1.7.3 Noise Monitoring

Noise monitoring will be performed by the MK SSHO at the initiation of tasks or operations posing an occupational risk. Sound levels will be determined at locations that best approximate the sound levels at the ear of potentially affected personnel. Calibration and records management will be performed per GSHP Section 7.2.5.

1.8 GENERAL SAFETY RULES AND PROCEDURES

Operations will be conducted in a safe manner consistent with the policies and procedures outlined in this SSHP. The number of personnel will be restricted to the minimum necessary to complete the required work as an administrative control to limit personnel exposures to potential site chemical and physical agents. All project and subcontractor personnel assigned to this project are responsible for following this SSHP and its approved modifications, for using safe practices, and for wearing the PPE specified by the MK SSHO. Project personnel will report hazards and unsafe conditions and practices to the MK SSHO. 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 removal from the work site and termination of employment.

1.8.1 Rules and Procedures

Refer to GSHP Section 8.2. The requirement for two fire extinguishers at the work site is changed to one only, and rules pertaining to work in contaminated areas are not applicable.

1.9 SITE CONTROL MEASURES

Prior to the commencement of field activities, the work zones will be established by MK's Subcontractor with the approval of the MK SSHO as necessary to meet operational and safety objectives. These work zones will be depicted on a Work Zone Map. The work zones will be defined by MK and MK's Subcontractor and posted at each work site. In addition to identifying the work zone, the drawing will show assembly points; evacuation routes; location of first aid equipment, fire extinguisher, and eye wash drench; and emergency communications equipment. One copy of the completed Work Zone Map will be retained by the MK SSHO in Attachment B, field master copy of this plan. Posted with the Work Zone Map will be the list of emergency phone numbers and a hospital route map.

1.9.1 Work Zone Controls

Before site operations begin, the Support Zone (SZ) MK site office and if applicable, the Subcontractor office, will be identified with signs. MK's Subcontractor will post signs at entrances to the work zone stating the following or equivalent:

HAZARDOUS AREA KEEP OUT
DANGER
AUTHORIZED PERSONNEL ONLY

MK's Subcontractor will control pedestrian traffic in interior work areas using traffic-type barricades such as cones and also caution tape where necessary. 100% fall protection will be implemented for any unprotected floor openings during dismantling operations and construction of the new floor sump.

1.10 PERSONNEL AND EQUIPMENT DECONTAMINATION AND HYGIENE PROCEDURES

1.10.1 General

Where applicable, potentially contaminated protective clothing will be disposed of rather than decontaminated. An equipment decontamination station will be established for equipment cleaning prior to and after excavation. Design and operation of the decontamination station will follow guidelines established in GSHP Section 10.3.

1.10.2 Personal Hygiene and Sanitation

Personnel exiting work zones are required to thoroughly wash their hands and face prior to eating, drinking, smoking, or using toilet facilities. A hand and face washing facility, including toilet facilities, will be identified in or near the work zone consisting of water, towels and soap for personnel. Lunchroom facilities for use by all personnel, will be identified by MK.

1.11 ON-SITE FIRST AID AND EQUIPMENT

At a minimum, a 16-unit first aid kit will be maintained by MK in its office. MK's Subcontractor will maintain a first aid kit at its office and each work site. The location of the first aid equipment will be communicated to project personnel as part of the site-specific training. Included with the first aid kit will be a CPR Pocket Mask and a biohazards control kit (used to clean up incidents involving body fluids). The MK SSSH can require upgrades to the first aid equipment requirements as deemed necessary.

One fire extinguisher and one portable eyewash drench will be available at each controlled work area. The emergency phone number list and route map to medical facilities will be posted at each office location and at each controlled work area with the Work Zone Map.

1.11.1 Report of First Aid Cases

All first aid cases, accidents and incidents including equipment damage incidents will be promptly reported to the MK SSSH. Refer to GSHP Section 11.2 for additional guidance on reporting requirements. The incident reporting requirement is revised such that a Navy CSIR Form, available from the MK SOUTHNAVFACENCOM Health and Safety Manager, will be used to document all OSHA recordables and equipment damage greater than \$1,000.00.

1.12 EMERGENCY RESPONSE PLAN AND CONTINGENCY PROCEDURES

1.12.1 General

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 emergency situations; however, the actual response will depend on the situation. In the event of an emergency, the MK SSSH, MK Site PM and/or Subcontractor Job Supervisors will direct all personnel to take appropriate action which could include any or all of the following:

- Evacuate all personnel involved to a safe place.
- **Notify NIROP Emergency Number at X2345 or 911.**
- Initiate emergency response action.

1.12.2 Pre-Emergency Planning

During mobilization activities for this project, the MK PM, MK SQCS, and the MK SSHO will review the MK Program Procedure PHSP 02.1 and execute the steps necessary to assure effective emergency response requirements and resources are established for this project.

1.12.3 Initial Reporting and Management of Incidents

All emergencies will be promptly reported to the **Notify NIROP Emergency Number at X2345 or 911** and to the MK SSHO. The MK SSHO will assure that the Navy designated authority is notified promptly and will direct initial emergency response actions until the arrival of the emergency response unit. The following contains the initial response actions to be taken by MK personnel and subcontractors at the work site for the type of incident incurred.

- **Incident Type: Accident involving vehicles and mobile equipment, process equipment, and structures.**
 1. **Notify NIROP Emergency Number at X2345 or 911**, include the following information:
 - A. Name and phone number of person calling;
 - B. Location of incident;
 - C. Type of incident;
 - D. Is anyone injured or trapped; and
 - E. Potential material release or spill conditions.
 2. MK SSHO, MK Site PM or Subcontractor Job Supervisor(s) designates one person to meet the emergency response units at the nearest road where the units will be approaching.
 3. MK SSHO, MK Site PM or Subcontractor Job Supervisor(s) assumes initial command of the situation and directs personnel to do one of the following either separately or concurrently:
 - A. Emergency shutdown of process equipment or mobile equipment -- evacuate the work zone or immediate area to a safe place and meet the incoming response units and provide all available information.
 - B. If fire is present -- initiate initial fire attack and knockdown using available fire extinguishing equipment followed by evacuating the work zone or immediate area.

- **Incident Type: Medical and Rescue Emergencies.**
 1. **Notify NIROP Emergency Number at X2345 or 911**, include the following information:
 - A. Name and phone number of person calling;
 - B. Location of incident;
 - C. Type of incident;
 - D. Person(s) injured or trapped and exposed to hazardous material.
 2. MK SSHO, MK PM or Subcontractor Job Supervisor(s) designates one person to meet the emergency response units at the nearest road where the units will be approaching.
 3. MK SSHO, MK PM or Subcontractor Job Supervisor(s) 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.
 4. For Confined Space Rescue, only emergency rescue units trained in confined space rescue will enter the confined space. The Designated Attendant for that work space must never enter the space as a rescue attempt unless relieved of attendant duties and assigned as a member of the trained rescue team by either the MK SSHO or the responsible supervisor for the confined space entry. The NIROP Emergency Dispatch Number (X2345 or 911) will be notified at least two hours in advance of any confined space entries.

1.13 LOGS, REPORTS AND RECORDKEEPING

1.13.1 Safety and Health Logbook

MK SSHO will maintain safety and health logbook in accordance with GSHP Section 13.1 including use of GSHP Figure 3 for daily recording.

1.13.2 Reports

A weekly site safety and health inspection report will be prepared by the MK SSHO in accordance with GSHP Section 13.2 and using Figure 4 from the GSHP for weekly reports.

1.13.3 Field Master Copy of SSHP

The MK SSHO will maintain a field master copy of this SSHP in accordance with the GSHP Section 13.3.

1.13.4 Recordkeeping

Refer to GSHP Section 13.4. The MK SSHO will receive copies of all records for 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 Subcontractors OSHA 200 Log. Per the Subcontract General Conditions 13(c), the Subcontractor will provide a monthly project safety review form and attach with it a copy of its OSHA 200 Log specific to this project. The MK SSHO will insure that information on Subcontractor exposure hours is provided to the MK SOUTHNAVFACENGCOM Health and Safety Manager on a monthly basis. A record of all first aid treatments not otherwise recordable will be maintained and furnished to MK or the Navy's designated authority upon request.

1.13.5 Safety and Health Project Completion Report

The MK SSHO will complete a safety and health project completion report at the conclusion of the field work in accordance with the GSHP Section 13.5.

1.14 ON-SITE WORK PLAN

This SSHP is Appendix A to the Work Plan.

1.15 COMMUNICATIONS PROCEDURES

Telephones will be selected as the primary choice of emergency communication and are installed on-site. The MK SSHO will test all communication systems prior to commencing work for confirmation of emergency communication capability.

1.16 SPILL CONTAINMENT PLAN

1.16.1 General

Spill and release accident scenarios could occur during dismantling and start-up operations. The scenarios include line breaks during flushing or during start-up and loss of containment of rinsates from decontamination activities. These types of spills can be generally classified as incidental, but will still require fast response to mitigate and clean-up the spill. The following information will be used by project personnel to respond to and mitigate any releases on the project site. In the event of a spill or release, the MK SSHO, MK PM and/or Subcontractor Job Supervisors will direct all personnel to take appropriate action which could include one or all of the following:

- Initiate spill response action.
- Notify the **NIROP Emergency Number at X2345 or 911**
- Evacuate the work zone to a safe place.

1.16.2 Preplanning for Spill Control

Construction, dismantling and start-up activities will be reviewed for release potential during Plan-of-the-Day meetings. During mobilization activities for this project, the MK PM, SSHO, and the SQCS will review the MK Program Procedure PHSP 03.1 and execute the steps necessary to assure effective spill response planning requirements and resources are established for this project. **The NIROP Emergency Number will be notified of any spills classified above incidental. They will in turn notify the NIROP Fire Department who will provide overall command and control of the of spill mitigation activities until relieved by a higher authority.**

1.16.3 Spill and Fire Control Materials and Equipment

When planning to flush pipes or handle containers containing hazardous or special waste materials, the following will be kept available in areas where spills, leaks or ruptures may occur: 1) salvage drums and container overpacks; 2) suitable quantities of proper absorbent materials; 3) portable containing material; 4) neutralizing agents, both acid and caustic, if necessary, based on the type of material being handled; 5) fire extinguisher; 6) emergency eyewash/drench station; and, 7) spill pallets or platforms for secondary containment.

Drums and containers used during a clean-up will be appropriate for 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 assured prior to being filled with any hazardous or special waste substance.

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

1.16.4 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 less dangerous locations. In some circumstances clean-up should not be attempted if the identification of the substance is not known unless Level B Protection is worn and decontamination stations have been established. Similarly, the patching of an active leak is not advised until an initial "Size-Up" of the situation is made by the MK SSHO and guidance established in Section 1.16.6 has been followed.

1.16.5 Drum, Container, and Tank Handling and Moving Procedures

Drums, containers, and/or tanks of hazardous or special waste substances will not be moved until the requirements for preparation have been completed (i.e., all required equipment and materials are at the work site ready for use, and the employees have been familiarized with their responsibilities, the emergency response procedures, and the potential hazards associated with the contents of the drums and containers). The same applies to process lines prior to flushing and start-up tests on lines charged with contaminated waste waters.

Work site operations will be organized to minimize the amount of drum or container movement. Each drum or container will be inspected before it is moved to ensure that it can be handled without suffering a rupture or puncture, and relocated without having the contents spill or leak.

Unlabeled or unmarked 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 evidenced by bulging or swelling, will not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been 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 or special waste substances, and the potential for equipment ignition sources to ignite vapors released from ruptured drums or containers will be controlled. Drums and containers that cannot be moved without rupture, leakage or spillage will be transferred to a sound container using a device specified for the material being transferred. During liquid transfer of flammable or combustible liquids, bonding and grounding equipment will be utilized.

1.16.6 Initial Reporting and Management of Incidents

All spill emergencies initially classified above an Incidental Release as defined below will be promptly reported to the **NIROP Emergency Number at X2345 or 911**.

Incidental Release - a release of hazardous material where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel. In addition, the quantity of released material does not exceed EPA Reportable Quantities (RQs). Note: it is anticipated that none of the collected waste or contaminated waste water contained in process piping prior to flushing will be present in any quantities that which if spilled, could exceed EPA RQs.

The MK SSHO, the MK Site PM and the Subcontractor Job Supervisors are responsible for directing initial emergency response actions until the arrival of the NIROP FIRE DEPARTMENT. The following contains the initial response actions to be taken by MK and Subcontractors at the work site for spill and release emergencies.

Spill Response Actions:

1. Classify spill as Incidental or an Emergency.
2. If Incidental (as defined above): a) notify immediate supervisor; b) assess hazard potential, and establish precautions and PPE requirements; c) begin clean-up of spill.
3. If Emergency, initiate response action in accordance with the following steps:
 - A. Quickly assess probability of safely stopping spill. If physical, chemical, or biological health hazards exist, immediately evacuate the area to a safe distance upwind and upgrade from the spill.
 - B. Notify the **NIROP EMERGENCY RESPONSE** and provide the following information:
 1. Name and phone number of person calling;
 2. Location of incident;
 3. Type of incident;
 4. Is anyone injured or trapped; and
 5. Estimated volume of material released.
 - C. MK SSHO, MK PM or Subcontractor Job Supervisors designates one person to meet the emergency response units at the nearest road where the units will be approaching.

- D. MK SSHO, MK PM or Subcontractor Job Supervisors 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 and meet the incoming response units and provide all available information.
 - b. Initiate initial spill response using available spill response equipment only for small emergency spill events where personnel are trained to mitigate. Evacuate the work zone or immediate area if there are any health threats or risks to personnel.
 - c. MK's PM will immediately notify the Navy's Designated Authority and the MK PMO. The Navy's Designated Authority is the ROICC assigned to this project.

1.17 CONFINED SPACES

Permit-required confined space entry will be encountered on this project if personnel are required to enter the any process tanks or the large building sump. All entries in spaces greater than four feet in depth will be treated as a permit-required confined spaces until (1) atmospheric monitoring is completed, (2) an assessment of physical, and (3) stored energy hazards (utility and process lines) has been documented by the MK SSHO. Air monitoring will be continuous unless otherwise specified by the MK SSHO. Continuous ventilation and monitoring in confined spaces is required, but may be modified based on actual site conditions with the concurrence of the MK SSHO. If conditions are satisfactory to the MK SSHO, the space may be downgraded to Alternate Entry Confined Space. Any confined space entry must follow the MK Industrial Hygiene (IH) Procedure 9.0 under the direction of the MK SSHO. This procedure is found in the MK IH Procedures Manual and is based on the OSHA regulation 29 CFR 1910.146.

Adequate provisions for rescue and emergency medical care must be made prior to entry. MK's Subcontractor will provide all entry equipment including atmospheric test equipment and will either provide its own confined space rescue capability or subcontract for this service. The MK SSHO will notify the NIROP Emergency Number at X2345 or 911 at least two hours in advance of any confined space entries.

Atmospheric conditions in open trenches greater than four feet in depth will be assessed by the MK SSHO prior to entry by personnel. This applies to any open excavations in areas where hazardous substances are stored nearby, landfills or excavations dug to expose process piping that carried a hazardous substance. All open excavations where personnel will entered will be safeguarded from collapse. The MK SSHO will make the decision in the field on the frequency of air monitoring in open excavations.

**TABLE A-1
PERSONNEL NAMES AND TELEPHONE NUMBERS**

Contact	Person or Agency	Telephone Number
Emergency Response	NIROP Emergency Response Dispatcher	X2345 or 911 emergency
Fire Department	NIROP Fire Department	X2345 or 911
Law Enforcement	NIROP Security	X2407
Law Enforcement	Fridley Police and Fire	(612) 571-3450 or 911
Ambulance Service	NIROP Medical	X2222 or 911
Robert Hlavacek	MK Program Manager	(803) 554-9367
Scott Newman	MK Senior Project Manager	(803) 554-0100
Marty Wilson	MK Field Operations Manager	(803) 554-6003
Greg Hibbard	MK Site Project Manager	(415) 442-7403
to be determined	MK Site Safety and Health Officer	to be determined
to be determined	MK Site Quality Control Supervisor	to be determined
Han Maung	MK Project Engineer	Office: (216) 523-3422 1-800-334-3081
William Piispanen	MK Health and Safety Program Manager	(208) 386-5930
Joel Murphy	SOUTHNAVFACENCOM Remedial Project Manager	(803) 820-5577
Pat Mosites	REICC	(612) 572-6438
Doug Hildre	United Defense Environmental Contact	(612) 572-6938
Rick Kamrath	United Defense Facilities Engineering	(612) 572-6887
Public Utility Locate Service	Gopher State One	(800) 252-1166
Poison Control Center	National Poison Control Center	(800) 492-2414
CHEMTRAC	Chemical Spill or Leak Emergencies	(800) 424-9300
National Response Center	National Response Center	(800) 424-8802
Hospital	Fridley Unity Medical Center	(612) 571-3450 (612) 780-6742
USEPA RCRA/CERCLA Hotline	USEPA	(800) 424-9346

**TABLE A-1
PERSONNEL NAMES AND TELEPHONE NUMBERS**

Contact	Person or Agency	Telephone Number
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Directions to Fridley Unity Medical Center, 500 Osborne Road Northeast #120, Minneapolis, MN 55432

1. From Main Gate, take East River Road North for 0.9 miles,
2. Bear right onto the on-ramp to I-694 heading east for 0.8 miles,
3. Turn left on University Avenue (Highway 47) heading north for 2.7 miles,
4. Turn right on unnamed street heading east for 0.1 miles,
5. Continue on 8 heading east for 0.5 miles,
6. Turn right on Jackson Street NE heading south for 0.2 miles to 500 Osborne Road NE.

A copy of the map to the hospital will be posted at work sites for reference.

**FIGURE A-1
HOSPITAL ROUTE MAP**

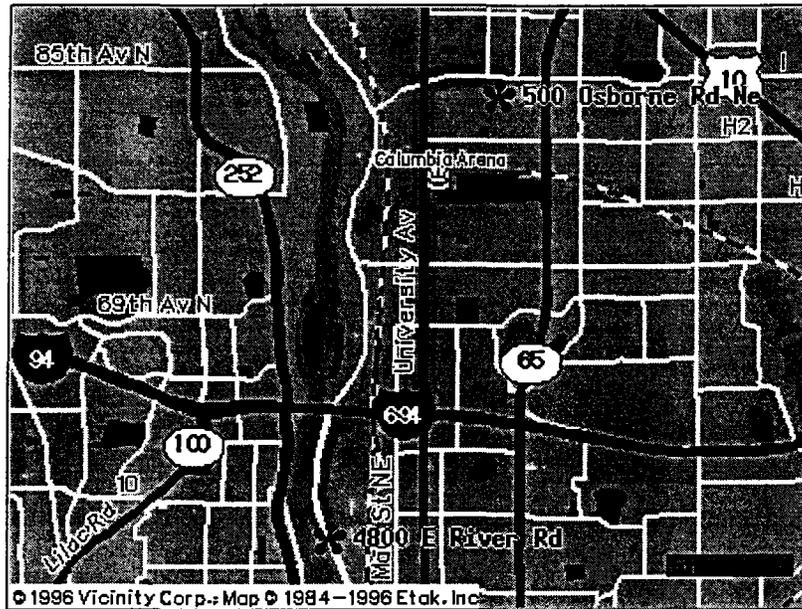
Note: The MK SSHO will verify directions to hospital during mobilization and obtain a better copy of the map for posting purposes.

From: 4800 E River Rd
Minneapolis, MN

To: 500 Osborne Rd Ne
Minneapolis, MN

WARNING: The above addresses were not precisely located. Please beware of this, and use these directions appropriately as a guide only.

The following *Easy Route* can assist you in reaching your destination.



Estimated travel time: 9.4 minutes for 5.1 miles of travel.
[Show Maneuver Maps]

	Directions	miles
1	Starting at 4800 E River Rd, begin on E RIVER RD heading north for 0.9 miles	0.0
2	Bear right onto the on-ramp to I 694 heading east for 0.8 miles	0.9
3	Turn left on UNIVERSITY AV (HWY 47) heading north for 2.7 miles	1.7
4	Turn right on UNNAMED STREET heading east for 0.1 miles	4.4
5	Continue on 8 heading east for 0.5 miles	4.5
6	Turn right on JACKSON ST NE heading south for 0.2 miles to 500 Osborne Rd Ne	5.0

(NOTE: like any driving directions/map you should always do a reality check and make sure the roads still exist watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.)

**TABLE A-2
TRAINING AND MEETINGS**

Type of Training or Meeting	Time of Training/Meeting	GSHP Reference
1. Site-Specific Training	At Site Prior to Work	GSHP Section 4.2
2. Confined Space	Before Mobilization	GSHP Section 4.3
3. Hazard Communication (awareness of chemicals used in previous treatment facility and contaminants collected plus any other chemical agents used in construction activities)	Before Mobilization	GSHP Section 4.5
4. CPR/First Aid & Bloodborne Pathogens	Before Mobilization	GSHP Section 4.6
5. Competent Person, fall protection.	Before Mobilization	Per OSHA 1926 Subpart M
6. Competent Person, hoisting and rigging.	Before Mobilization	Per OSHA 1926.251
7. Safety Meeting	Weekly During Work	GSHP Section 4.8, complete safety meeting form found in the GSHP
8. Plan-of-the-Day Meeting	Daily During Work	GSHP Section 4.9, document meeting attendance.
9. Quality Control Preparatory Phase Inspection Meeting	Before each Definable Feature of Work	GSHP Section 4.11
10. Recordkeeping	Before Work Start	GSHP Section 4.12

**TABLE A-3
MINIMUM PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS BY TASK**

Site	Activity	PPE
Ground-Water Treatment Facility	1. Site Preparatory Work.	1. Level D. See Note 1.
	2. Removals and existing facility modifications.	2. Level D
	3. Equipment installation.	3. Level D
	4. Underground piping and utilities.	4. Level D
	5. Electrical system and instrumentation.	5. Level D
	6. Controls system.	6. Level D
	7. Operational start-up.	7. Level D, modifications will be delineated in O&M Plan.
	8. Sampling and analysis.	8. Modified Level D, details will be added to O&M Plan.
	9. Waste management.	9. Level D for construction debris. For operations, modified Level D, details will be added to O&M Plan.
	10. Equipment decontamination.	10. Modified Level D.

Notes:

1. Level D = work coveralls or equivalent, hardhat, safety glasses with side shields, steel-toed boots, and leather or cloth work gloves.
2. Modified Level D for Equipment decontamination = same as Level D, add water resistant outer garments with gloves and faceshield if high pressure wash. Rubber is satisfactory as the outer garment.

ATTACHMENT A
ACTIVITY HAZARD ANALYSIS (AHA)

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Site Preparatory Work (all areas).		Analyzed By/Date: Frank J. Petrik 5/19/97	Reviewed By/Date:
1.0	Principal Steps	Potential Hazards	Recommended Controls
1.1	Walk area down, establish work zones.	1.1a. Struck by and struck against physical objects during site preparation and slips, trips and falls.	1.1a. Preplan work layout (Work Zone Map completed and posted by MK, also emergency numbers and hospital map). Use correct hand and power tools for job and good housekeeping practices. MK SSHO to identify areas that require special attention to pedestrian safety.
1.2	Complete and verify energy control on process equipments.	1.2a. Electrical and mechanical energy.	1.2a. Preplan energy control requirements and coordinate with engineering department. Subcontractor to lock-out and tag-out.
1.3	Equipment to be Used	Inspection Requirements	Training Requirements
1.4	Hand and power tools.	Daily inspection by Sub, prior to use, per manufacturer's recommendation. Initial safety inspection of all Subcontractor equipment to be completed by MK SSHO.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. Competent Persons in fall protection and hoisting and rigging identified in writing.

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Removals and Existing Facility Modifications.		Analyzed By/Date: Frank J. Petrik 5/19/97	Reviewed By/Date:
2.0 Principal Steps	Potential Hazards	Recommended Controls	
<p>2.1 Disconnect and remove system components.</p> <p>Repair and replace roof and wall.</p>	<p>A. Struck by and struck against incidents during material handling tasks.</p> <p>B. Slip, trips and falls.</p> <p>C. Stored energy in process equipments and components including process fluid hold-up.</p>	<p>A. Preplan material handling, mechanize where possible. Insure clear walkways and entry/exit points. Competent person calculates all safe loading and selection of hoisting and rigging configuration. Use of facility overhead cranes requires certified operator and copy of current crane inspection certificate and inspection prior to use.</p> <p>B. Competent person insures 100% fall protection is implemented.</p> <p>C. Energy control in place. Use caution when disconnecting process piping and check for suspect hold-up.</p>	
2.3 Equipment to be Used	Inspection Requirements	Training Requirements	
2.4 Material handling equipment (overhead cranes) including hoisting and rigging equipment, and hand tools.	Daily, prior to use per manufacturer's recommendation.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. Competent Person in fall protection and hoisting and rigging.	

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Equipment Installation.		Analyzed By/Date: Frank J. Petrik 5/19/97
		Reviewed By/Date:
3.0 Principal Steps	Potential Hazards	Recommended Controls
3.1 Delivery, site inspection and placement/connection of components.	<p>A. Struck by and struck against incidents during material handling tasks.</p> <p>B. Slip, trips and falls.</p> <p>C. Electrical and mechanical energy.</p> <p>D. Confined space.</p> <p>E. Trench and form collapse (Building Sump).</p>	<p>A. Preplan material handling, mechanize where possible. Insure clear walkways and entry/exit points. Competent person calculates all safe loading and selection of hoisting and rigging configuration. Use of facility overhead cranes requires certified operator and copy of current crane inspection certificate and inspection prior to use.</p> <p>B. Competent Person insures 100% fall protection is implemented.</p> <p>C. Maintain lock-outs and tag-outs on potentially energized equipment until authorized for removal during system checkout and start-up.</p> <p>D. MK SSHO will identify all confined spaces and mark appropriately and complete entries per confined space entry procedures.</p> <p>E. Trenching and form construction requires daily inspection by competent person. MK SSHO to assess confined space entry requirements.</p>
3.3 Equipment to be Used	Inspection Requirements	Training Requirements
3.4 Material handling equipment (overhead cranes) including hoisting and rigging equipment and hand tools.	Daily, prior to use per manufacturer's recommendation.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. Competent Person in fall protection and hoisting and rigging.

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Underground Piping and Utilities.		Analyzed By/Date: Frank J. Petrik 5/19/97	Reviewed By/Date:
4.0 Principal Steps	Potential Hazards	Recommended Controls	
4.1 Excavation and trenching, jacking below railroad tracks, installation of conveyances, concrete pavement removal and replacement.	<p>A. Struck by and struck against incidents during excavation/trenching and material handling tasks.</p> <p>B. Slip, trips and falls.</p> <p>C. Collapse or cave-in of excavation.</p>	<p>A. Preplan work area and material handling, mechanize where possible. MK SSHO ensures completion of excavation and trenching permit and locating/marketing of all utility lines. Ensure clear walkways and place caution tape around open excavations (unless upgrade to Class 1 or 2 perimeter protection is required). Competent person inspects all excavations and trenches on a daily basis. Upgrade PPE for concrete cutting per equipment manufacturers recommendations.</p> <p>B. Same as above.</p> <p>C. Soil classified as C, excavations will be safeguarded per OSHA 29 CFR 1926 Subpart P and EM 385-1-1 using 1.5 to 1 slopes.</p>	
4.3 Equipment to be Used	Inspection Requirements	Training Requirements	
4.4 Excavation equipment, hand and power tools and material handling equipment.	Daily, prior to use per manufacturer's recommendation.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. Competent Person in excavation safety and hoisting and rigging.	

ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Electrical System and Instrumentation.		Analyzed By/Date: Frank J. Petrik 5/19/97	Reviewed By/Date:
5.0 Principal Steps	Potential Hazards	Recommended Controls	
5.1 Install new electrical control equipment and panel boxes.	<p>A. Struck by and struck against incidents during material handling tasks.</p> <p>B. Slip, trips and falls.</p> <p>C. Electrical shock.</p>	<p>A. Preplan material handling, mechanize where possible. Competent person calculates all safe loading and selection of hoisting and rigging configuration for applicable components. Use of facility overhead cranes requires certified operator and copy of current crane inspection certificate and inspection prior to use.</p> <p>B. Maintain clear walkways and entry/exit points.</p> <p>C. Energy control (lock-out/tag-out) in place until ready for start-up.</p>	
5.2 Equipment to be Used	Inspection Requirements	Training Requirements	
5.3 Material handling equipment including hoisting and rigging equipment and hand tools.	Daily, prior to use per manufacturer's recommendation.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. Competent Person in hoisting and rigging.	

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Operational Start-Up.		Analyzed By/Date: Frank J. Petrik 5/19/97
		Reviewed By/Date:
6.0 Principal Steps	Potential Hazards	Recommended Controls
6.1 Steps will be reviewed in the field and subsequent analysis will be performed by the MK SSHO which includes preparation of new AHA worksheets for start-up and operations.	Struck-by and struck against; slips, trips and falls; mechanical or electrical energy release; fire; and spills.	<p>MK SSHO to analyze start-up and operations for potential hazards. All vendor supplied data shall be reviewed for manufacturers' listed cautions and warnings.</p> <p>All piping and vessel grounding requirements will be checked for correct installation. Electrical ratings on equipment will be verified correct per design specification.</p> <p>All containers and piping will be labeled per HAZCOM.</p> <p>Energy control procedure will be established. Portable spill containment equipment will be staged, also fire extinguishers.</p>
6.2 Equipment to be Used	Inspection Requirements	Training Requirements

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ACTIVITY HAZARD ANALYSIS (AHA)

Activity: Sampling and Analysis.		Analyzed By/Date: Frank J. Petrik 5/19/97	Reviewed By/Date:
7.0 Principal Steps	Potential Hazards	Recommended Controls	
7.1 Steps will be reviewed in the field and subsequent analysis will be performed by the MK SSHO which includes preparation of new AHA worksheets for start-up and operations.			
7.2 Equipment to be Used	Inspection Requirements	Training Requirements	
7.3			

ACTIVITY HAZARD ANALYSIS (AHA)		
Activity: Waste Management and Equipment Decontamination.		Analyzed By/Date: Frank J. Petrik 5/19/97
Reviewed By/Date:		
8.0 Principal Steps	Potential Hazards	Recommended Controls
8.1 Stage waste material, prepare for offsite shipment. 8.2 Equipment Decontamination.	Struck by and struck against physical objects, slips, trips and falls during waste handling and decontamination.	Preplan all waste handling/decontamination and select proper containers and disposal methods. No oil or grease soaked rags in construction debris containers, use proper receptacles. Remove construction debris from work areas on a daily basis. Level D PPE, modify where necessary as determined by MK SSHO. Insure all waste containers are marked per OSHA hazard communication and DOT for off-site shipment. Use Modified Level D during equipment decontamination. Secure object to be decontaminated. Vehicles should be shut down and in zero energy state during this activity.
Equipment to be Used	Inspection Requirements	Training Requirements
8.3. Material handling equipment and containers. Decontamination equipment.	Inspect all work areas on daily basis and maintain good housekeeping practices.	Site Safety and Health Plan (Project Kickoff), Hazard Communication and POD. DOT Haz Mat for person supervising the preparation and shipment of materials.

ATTACHMENT B

WORK ZONE MAPS

Note: The Work Zone Map are field prepared by MK and the Subcontractor and approved by the MK SSHO per Section 1.9 of SSHP.

APPENDIX B
QUALITY CONTROL DOCUMENTATION

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<u>TITLE</u>	<u>CHECKLIST NUMBER</u>	<u>PAGE</u>
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Testing Plan And Log	N/A	B-4
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Removals and Existing Facility Modifications	RE-01	1 page
Mechanical Installation	ME-01	1 page
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Excavation	EX-01	1 page
Backfill and Compaction	BF-01	1 page
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Electrical System and Instrumentation	EL-01	2 pages
Operational Start-Up	OP-01	1 page
Sampling and Analysis	SA-01	1 page
Waste Management	WM-01	1 page
Regulatory Compliance1	RG-01	1 page

Certificate of Satisfactory Completion

GROUND-WATER TREATMENT FACILITY

Naval Industrial Reserve Ordnance Plant Fridley, Minnesota

Naval Facilities Engineering Command, Southern Division
ERAC Contract Number: N62467-93-D-1106
Delivery Order Number: 0039
Statement of Work: 047

The following personnel acknowledge the satisfactory installation and construction of the Ground-Water Treatment Facility for Operable Unit Number One in accordance with the Work Plan and approved changes at Naval Industrial Reserve Ordnance Plant (NIROP) Fridley, Minnesota.

Morrison Knudsen Corporation

Name: _____

Signature: _____

Title: _____

Date: _____

NIROP

Name: _____

Signature: _____

Title: _____

Date: _____

Testing Plan And Log

Definable Feature of Work	Inspection Checklist	Three Phases of Control (Enter Dates that Inspections are Performed)			Test or Inspection Results	Comments
		Preparatory	Initial	Follow-up		
Site Preparatory Work	SP-01					
Removals and Existing Facility Modifications	RE-01					
Equipment Installation	ME-01, CO-01					
Underground Piping and Utilities	EX-01, BF-01, PI-01, DE-01					
Electrical System and Instrumentation	EI-01					
Controls System	NA					
Operational Start-Up	OP-01					
Sampling and Analysis	SA-01					
Waste Management	WM-01					
Regulatory Compliance	RG-01					



Checklist Title Site Preparatory Work			Checklist No. SP-01	Revision Rev. 0	Checklist Page 1 of 1
Item No.	Item Checked	Accept/ Reject	Remarks		Verified By /Date
Preparatory Inspection					
1	Perform preparatory phase meeting prior to initiating work.				
2	Verify Work Zone is clearly delineated.				
3	Verify completion of any initial surveys.				
4	Verify that a review of safety requirements is performed as part of the preparatory inspection. (Briefing by Site Safety & Health Officer).				
5	Ensure that housekeeping and maintenance requirements are understood.				
Initial Inspections					
1	Confirm work areas have been located within the limits of established stakes, lines or monuments.				
2	Verify that protection of items not to be removed or disturbed has been provided, as necessary.				
3	Verify removal from the construction area of debris and other deleterious materials.				
4	Ensure compliance with the plans identified in the Preparatory Phase.				
Follow-Up Inspections					
1	Ensure that needed revisions to the Work Plan are documented and approved by the Project Manager and the REICC.				
2	Verify continuing compliance with the approved plans identified during the Preparatory Phase Inspection.				
3	Verify completion of site preparatory activities is complete and in accordance with the Work Plan.				

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Site Preparatory Work SP-01	Page 1 of <u>1</u>
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Checklist Title Removals and Existing Facility Modifications			Checklist No. RE-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Perform preparatory phase meeting.			
2	Review the Work Plan and Specification for Removals and Existing Facility Modifications.			
3	Verify completion of a site survey to identify items to be removed and modified.			
4	Verify that a review of safety requirements is performed (lock-out/tag-out) as part of the preparatory inspection.			
5	Ensure that housekeeping and maintenance requirements are understood.			

Initial Inspections

1	Confirm that items for removal and modification have been marked and identified.			
2	Verify that the safety-measures (e.g. lock-out/tag-out) are in place.			
3	Verify that protection of items not to be removed or disturbed has been provided, as necessary.			
4	Verify removed items are stored in approved locations.			

Follow-Up Inspections

1	Ensure that removal are completed as per Work Plan and Specifications.			
2	Ensure that modifications are completed as per Work Plan and Specifications.			
3	Ensure that removed items are disposed of in accordance with the Waste Management Plan.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project OP Fridley	Delivery Order Number 0039-047	Checklist Title Removals and Existing Equipment Modifications RE-01	Page 1 of <u>1</u>
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Checklist Title Mechanical Installation			Checklist No. ME-01	Revision Rev. 0	Checklist Page 1 of 1
Item No.	Item Checked	Accept/ Reject	Remarks		Verified By /Date
Preparatory Inspection					
1	Perform preparatory phase meeting.				
2	Review the Drawings and Specification for Mechanical Installation.				
3	Verify that the equipment meets the technical specifications.				
Initial Inspections					
1	Verify that installation location is correct.				
2	Verify that equipment is handled in accordance with manufacturer's instructions.				
Follow-Up Inspections					
1	Ensure that all equipment are installed in accordance with the Drawings and Specifications.				
2	Ensure that the equipment is inspected prior to startup.				
3	Ensure that all packaging and excess material are removed from the area.				

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:



Checklist Title Concrete Placement			Checklist No. CO-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Verify all requirements of concrete specifications have been met before delivery or placement of concrete -- tests, mix design, ingredients, inspections, etc.			
2	Testing laboratory is notified prior to pour, and testing is arranged at plant and/or site.			

Initial Inspections

1	Confirm all areas to receive concrete are cleaned, wetted, or otherwise prepared as required. Foundations are as required. Previously placed concrete is properly prepared to receive new, as applicable			
2	Conveying equipment and depositing equipment are capable of making placement without segregation, loss of ingredients, formation of air pockets, or cold joints.			
3	Temporary form openings, tremies, chutes, etc., are as required.			
4	Delivery of concrete and sequence of delivery is scheduled to allow continuous placement to prevent cold joints.			

Follow-Up Inspections

1	Concrete vibration is being performed per ASTM/ACI.			
2	Slump tests are being performed per ASTM/ACI and at the frequency required by specification.			
3	The timing of each lift is such that cold joints are prevented. Verify that concrete has not achieved initial set before additional concrete is added.			
4	Where cold joints are expected, due to delays in concrete deliveries, construction joints are formed per specification.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project OP Fridley	Delivery Order Number 0039-047	Checklist Title Concrete Placement CO-01	Page 1 of <u>1</u>
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Checklist Title Excavation		Checklist No. EX-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Review specification and drawings to understand scope of excavation.			
2	Verify that excavation permits have been obtained.			
3	Verify that underground utilities have been identified and marked.			
4	Verify that the Work Zone has been clearly delineated in the field.			
5	Verify that a Stockpiling Plan has been developed by Subcontractor and conforms to the Technical Specifications.			
6	Ensure that a Safe Excavation Plan has been developed by Subcontractor and conforms to the Technical Specifications.			
7	Verify that procedures and equipment for line breaks under pressure are in place and understood.			

Initial Inspections

1	Ensure that work is proceeding according to the plans discussed in the preparatory phase.			
2	Verify protection of items that are to remain.			
3	Verify that a dewatering sump is in place prior to further excavation beneath ground-water table.			

Follow-Up Inspections

1	Ensure that excavated soil is stockpiled, shaped, and managed according to the Stockpiling Plan.			
2	Verify that any over-excavation has MK approval.			
3	Verify that shoring (if any) is in accordance with approved plans and drawings.			
4	Verify that erosion control measures are maintained daily.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NOROP Fridley	Delivery Order Number 0039-047	Checklist Title Excavation EX-01	Page 1 of <u>1</u>
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Checklist Title Backfill and Compaction			Checklist No. BF-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Review specifications for soil types to be used as backfill material.			
2	Ensure that a laboratory soil testing report, if required, has been prepared.			

Initial Inspections

1	Check that backfill materials comply with specifications (moisture, density, gradation).			
2	Verify that shoring, if installed, has been approved and that provisions have been made for safety barricades.			
3	Verify that sub-standard materials (tree roots, etc.) are removed.			
4	Confirm that drainage, de-watering, etc., have been completed.			

Follow-Up Inspections

1	Verify that backfill materials are compacted in lift thicknesses that do not exceed specification. Compaction testing of lifts shall also be confirmed.			
2	Verify that excess backfill material are removed.			
3	Verify that the excavated area has been restored as per specification.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project OP Fridley	Delivery Order Number 0039-047	Checklist Title Backfill and Compaction BF-01	Page 1 of <u>1</u>
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Checklist Title Underground Piping Installation			Checklist No. PI-01	Revision Rev. 0	Checklist Page 1 of 1
Item No.	Item Checked	Accept/ Reject	Remarks		Verified By /Date

Preparatory Inspection

1	Review specifications for piping and fitting.			
2	Ensure that excavation has been completed.			

Initial Inspections

1	Assure all piping, fitting, and accessory materials are in accordance with job specifications.			
2	Check coatings or wrapping for damage before and during installation.			
3	Check trench bedding for proper grading to provide a solid, continuous, uniform bearing for each section of pipe.			
4	Assure trenches are free of standing water.			

Follow-Up Inspections

1	Verify that pipe, fittings, and accessories are handled in such a manner as to avoid damage by impact, abrasions, or other causes.			
2	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.			
3	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.			
4	Verify that bolts on flanges are properly tightened.			
5	Assure all required inspections, tests, hydrostatic/pneumatic tests, and/or NDE work for the piping has been performed.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Underground Piping Installation PI-01	Page 1 of <u>1</u>
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Checklist Title Decontamination			Checklist No. DE-01	Revision Rev. 0	Checklist Page 2 of 2
Item No.	Item Checked	Accept/ Reject	Remarks		Verified By /Date

Preparatory Inspection

1	Verify Subcontractor Decontamination Plan is submitted and it conforms with the Technical Specification.			
2	Review the specification requirements regarding establishment of the Decontamination Facility.			
3	Review the requirement for daily visual inspection of the decontamination facility and documentation requirements.			
4	Review decontamination procedures for the external surfaces of construction and field equipment as contained in the Work Plan/Technical Specifications			
5	Verify that container for storage of decontamination water is established and of adequate size.			
6	Verify Subcontractor has required supplies for decontamination activities.			
7	Review Site Safety & Health Plan requirements for the Personnel Decontamination Facility. (Briefing by the Site Safety & Health Officer).			

Initial Inspections

1	Verify that the decontamination facility is constructed in an area approved by the Project Manager.			
2	Verify that decontamination facilities are delineated with orange fencing and appropriate signs as part of the contamination reduction zone.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project	Delivery Order Number	Checklist Title	
NIROP Fridley	0039-047	Decontamination DE-01	Page 2 of <u>2</u>



MORRISON KNUDSEN CORPORATION

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Decontamination		Checklist No. DE-01	Revision Rev. 0	Checklist Page 1 of 2
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Initial Inspection

3	Perform an initial inspection of the decontamination facility liner for the following attributes: evidence of tears and holes; evidence of seepage; that the sheeting is adequately fastened to the side walls; that the liner adequately covers the end sections and is secured by sandbags or other appropriate means; that expected quantities of generated liquids can be contained until collected for disposal			
4	Verify that records are established that specify decontamination facility construction materials and methods, disposition of liquids, and any repairs and/or breaches of liner integrity.			
5	Verify decontamination activities are performed in accordance with the Work Plan and Technical Specifications.			

Follow-up Inspections

1	Monitor on-going decontamination operations to verify compliance with the Work Plan/Technical Specifications.			
2	Verify that daily inspections of the decontamination facility are performed and documented.			
3	Verify that records of any breaches and/or repairs to the liner are documented.			
4	Verify decontamination wastes are disposed of properly.			
5	Verify upon dismantlement of the decontamination facility, that underlying material is not contaminated and no indications of contamination are present (i.e. saturated ground, discolored ground). Potentially contaminated soil shall be sampled and analyzed prior to removal and managed per the Sampling and Analysis Plan.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

Project	Delivery Order Number	Checklist Title	
NIROP Fridley	0039-047	Decontamination DE-01	Page 1 of <u>2</u>

**MORRISON KNUDSEN CORPORATION**

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Electrical System and Instrumentation	Checklist No. EI-01	Revision Rev. 0	Checklist Page 1 of 2
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Item No.	Item Checked	Accept/Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Verify that all sources and outlets are identified and that colors of nameplates and conductor tags conform to specified color codes.			
2	Verify that ventilation openings are not obstructed.			
3	Verify that label plates and fuse rating nameplates are correct.			
4	Verify that lock-out/tag-out procedures are available.			

Initial Inspections

1	Verify correct equipment is installed (check nameplate) in accordance with manufacturers' instructions and that wiring devices are as specified.			
2	Verify the equipment is installed in the correct location with the correct orientation.			
3	Verify that equipment is properly mounted and aligned and clearances are correct.			
4	Verify incoming conduit is properly supported, free of corrosion and rust, and coated with a conductive galvanizing material.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Electrical System and Instrumentation EI-01	Page 1 of <u>2</u>
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**MORRISON KNUDSEN CORPORATION**

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Electrical System and Instrumentation		Checklist No. EI-01	Revision Rev. 0	Checklist Page 1 of 2
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Follow-Up Inspections

1	Verify that connections and all power wiring have been checked for tightness, and that other field tests have been performed according to Work Plan requirements.			
2	Verify that all systems and equipment are in satisfactory working order and ready for normal service.			
3	Confirm that all materials installed out of doors are approved for outdoor use.			
4	Confirm that all materials installed out of doors are approved for outdoor use.			
5	Confirm that the installation complies with applicable rules, codes and standards.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Electrical System and Instrumentation EI-01	Page 1 of <u>2</u>
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**MORRISON KNUDSEN CORPORATION**

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Operational Start-Up		Checklist No. OP-01	Revision Rev. 0	Checklist Page 2 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection				
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1	Verify that a startup checklist is available.			
2	Verify that a checklist identifying the normal valve positions is available.			
3	Verify that a startup procedure is available.			
4	Verify that normal and emergency shutdown procedures are available.			

Initial Inspections				
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1	Ensure that the system has been inspected using the startup checklist.			
2	Ensure that the valves are set at normal position.			
3	Ensure that the system is started using the start-up procedure.			

Follow-Up Inspections				
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1	Observe continuing operation of the system.			
2	Ensure that corrective actions are taken, if required.			
3	Ensure that the alarms and controls are tested as specified.			
4	Ensure that the system is shut down as per procedure when startup operations are completed.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Operational Start-Up OP-01	Page 2 of <u>1</u>
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MORRISON KNUDSEN CORPORATION

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Sampling and Analysis		Checklist No. SA-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection

1	Schedule Preparatory Phase Meeting prior to initiating field analytical sampling activities.			
2	Verify that analytical laboratory services have been procured.			
3	Verify that sample containers, coolers, chain-of-custody records (COCs), labels, seals and all necessary sampling equipment is present.			

Initial Inspections

1	Verify that sampling equipment is properly protected from possible contamination prior to sample collection.			
2	Verify that the correct sample containers are used for sample collection.			

Follow-Up Inspections

1	Ensure that samples are properly field-preserved per the SAP.			
2	Ensure that sample containers are properly identified with labels.			
3	Ensure that sample coolers are sealed with custody seals after samples are packed.			
4	Ensure that COCs and receipt for sample forms are properly completed. REVIEW ALL COCs PRIOR TO SAMPLE SHIPMENT.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Sampling and Analysis SA-01	Page 1 of <u>1</u>
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**MORRISON KNUDSEN CORPORATION**

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title			Checklist No.	Revision	Checklist Page
Waste Management			WM-01	Rev. 0	Page 1 of 1
Item No.	Item Checked	Accept/Reject	Remarks		Verified By /Date
Preparatory Inspection					
1	Coordinate with Public Works to identify storage areas for potential hazardous waste.				
2	Verify that appropriate waste containers are available.				
3	Verify that the disposal/treatment facility is approved by the Project Manager.				
Initial Inspections					
1	Verify that all containers are labeled with the source and generation date.				
2	Verify that drums are placed on pallets for shipment and that the drums are banded together with non-metallic banding.				
3	Ensure that waste manifests are completed.				
4	Verify that a log is kept of generated wastes.				
Follow-Up Inspections					
1	Verify that containers are transported to the proper staging areas.				
2	Verify that a copy of the waste log is provided to the ROICC on a weekly basis.				

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project

NIROP Fridley

Delivery Order Number

0039-047

Checklist Title

Waste Management WM-01

Page 1 of 1

**MORRISON KNUDSEN CORPORATION**

ENGINEERING, CONSTRUCTION, ENVIRONMENTAL GROUP

FIELD INSPECTION CHECKLIST

Checklist Title Regulatory Compliance		Checklist No. RG-01	Revision Rev. 0	Checklist Page 1 of 1
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Item No.	Item Checked	Accept/ Reject	Remarks	Verified By /Date
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Preparatory Inspection				
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1	Review applicable environmental regulations identified in the Work Plan.			
2	Verify that all personnel handling hazardous substance are trained per 29 CFR 1910.120 and training is up-to-date.			

Initial Inspections				
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1	Verify that training certificates of workers are received in accordance with 29 CFR 1910.120 and 29 CFR 1926.65 prior to start of work.			
2	Verify that all workers handling hazardous waste are trained per 49 CFR 172.704 and 29 CFR 1910.120.			
3	Ensure that an approved NPDES permit is available prior to discharge of effluent to the storm sewer.			

Follow-Up Inspections				
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1	Ensure regular inspections are performed on hazardous waste accumulation areas per 40 CFR 262.			
2	Ensure that laboratory test results of effluent samples are within the limits of NPDES permit prior to discharge to the storm sewer.			

Additional Notes or comments: Use Additional Sheets as necessary

Specific Item Identification or Location, as applicable:

MK Project NIROP Fridley	Delivery Order Number 0039-047	Checklist Title Regulatory Compliance RG-01	Page 1 of <u>1</u>
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**APPENDIX C
ENVIRONMENTAL PROTECTION PLAN**

**APPENDIX C
ENVIRONMENTAL PROTECTION PLAN**

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2.2 PROTECTION OF WATER RESOURCES	C-4
2.3 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES	C-4
2.4 TRENCHING	C-4

1.0 INTRODUCTION

This Plan describes the environmental protection measures MK proposes to use at NIROP Fridley. The project involves installation and construction of a ground-water treatment facility (GWTF). Except for the conveyance trench, the installation and construction will be performed indoors in existing buildings. Also, the conveyance trench will be constructed through uncontaminated area. Therefore, the installation and construction of the GWTF will have minimal impact on existing air, water and soil conditions at the site.

2.0 MEASURES FOR PROTECTING NATURAL RESOURCES

2.1 LAND PROTECTION

Except for any work or storage areas and access routes specifically assigned for use, the land areas will be preserved in their present condition. The work will not require clearing and grubbing prior to construction and system installation.

2.2 PROTECTION OF WATER RESOURCES

There are no streams or bodies of water in the work area.

During start-up and testing of the GWTF, the effluent will be discharged to the sanitary sewer in accordance with the MWCC permit until the laboratory results indicate that the NPDES criteria has been met. Once the NPDES criteria is achieved, the effluent will be discharged to the Mississippi River through existing outfalls.

2.3 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

The office trailers and other temporary facilities will be removed after work activities are completed. All disturbed areas will be returned to their original condition.

2.4 TRENCHING

During trenching, measures will be implemented to control dust, erosion, run-on and run-off. Dust control will be accomplished by wetting the soil with a wetting spray. Soil stockpiles will be covered for erosion control and excavations will be bermed to control run-on and run-off. After the installation of piping is completed, the trench will be backfilled and the site restored to original condition.

**APPENDIX D
WASTE MANAGEMENT PLAN**

**APPENDIX D
WASTE MANAGEMENT PLAN**

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2.1 DEMOLITION DEBRIS	D-4
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2.3 DISPOSABLE PERSONAL PROTECTIVE EQUIPMENT	D-4

1.0 INTRODUCTION

This plan describes methods to manage the various waste streams generated during this project. All generated wastes, including used GAC unit, decontamination water, and drummed PPE will be handled, stored, transported, and disposed of in accordance with all applicable federal, state and local regulations. The Material Safety Data Sheets (MSDSs) for the materials used during construction and installation will be available on site.

MK is responsible for the following activities:

- Ensuring that all waste streams are managed in accordance with the procedures in this plan
- Providing field oversight and ensuring Subcontractor compliance with the procedures in this plan
- Ensuring that appropriate waste containers are provided
- Ensuring all waste containers are properly labeled and managed in accordance with state and federal laws and regulations
- Maintaining waste records for the field effort

The Navy will be the Generator of the wastes and MK will prepare all manifests before they are signed by the Navy Public Works Officer (PWO) representative. Copies of all the manifests will be transmitted to the Navy PWO.

All personnel handling hazardous waste will be trained per 49 CFR 172.704 and 29 CFR 1910.120. All personnel responsible for waste labeling, inspecting, profiling, manifesting, and transportation preparation will be trained per 49 CFR 172.704, 29 CFR 1910.120, HM-181, and HM-126.

2.0 WASTE STREAMS

Waste streams expected to be generated during work activities include:

- Demolition debris
- Decontamination liquids
- Disposable personal protective equipment and clothing

2.1 DEMOLITION DEBRIS

The demolition debris will include all items removed from the Control House and Building 52. The debris will be temporarily stored on-site. Items that will be reused at site will be segregated from items to be disposed of at an off-site facility. Scrap metals will be shipped to a smelter and the remaining debris will be disposed of in a landfill as special waste.

2.2 DECONTAMINATION LIQUIDS

Liquids generated during decontamination will be pumped to on-site sanitary sewer.

2.3 DISPOSABLE PERSONAL PROTECTIVE EQUIPMENT

Used personal protective equipment (PPE) includes disposable Tyvek suits, gloves, booties, and plastic sheeting. The quantity of PPE generated depends upon the schedule and the number of times PPE is discarded daily. Contaminated PPE will be placed in a plastic-lined 55-gallon drum immediately after use and the drum will be labeled to identify its contents and source of generation. Used PPE will be disposed of in a landfill as special waste.

WORK PLAN

GROUND-WATER TREATMENT FACILITY

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT FRIDLEY, MINNESOTA

Revision #0
September 12, 1997

CONTRACT #N62467-93-D-1106
DELIVERY ORDER #0039
STATEMENT OF WORK #047

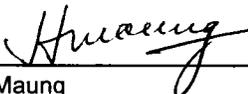
Prepared For:

**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**
P. O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

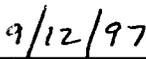
Prepared by:

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

PREPARED/APPROVED BY:

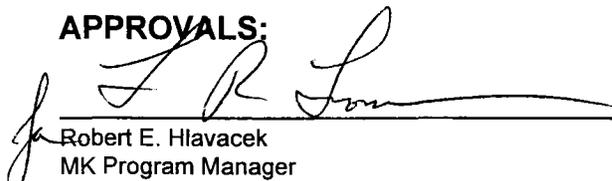


Han Maung
MK Project Engineer

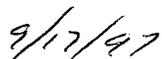


Date

APPROVALS:



Robert E. Hlavacek
MK Program Manager



Date

CLIENT ACCEPTANCE

U.S. Navy Responsible Authority

Date