# APPENDIX F

# HEALTH AND SAFETY PLAN

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## HOOKER/RUCO SITE
## HICKSVILLE, NEW YORK

MAY 2005
REF. NO. 6883 (45)

**APPROVAL FORM**

This Health and Safety Plan for the construction and operation of the groundwater remediation system has been reviewed and approved by one of Conestoga-Rovers & Associates' (CRA's) Certified Industrial Hygienists.

May 25, 2005
*(Date)*

G. J. Naherne, CIH
*(Signature)*

G. J. NAHERNE, CIH
*(Print Name)*
*(Certified Industrial Hygienist)*

TABLE OF CONTENTS

TABLE OF CONTENTS

## LIST OF FIGURES
(Following Report)



## LIST OF TABLES
(Following Report)

# LIST OF ATTACHMENTS

## 1.0 INTRODUCTION

The Health and Safety Plan (HASP) presented herein describes the health and safety procedures and emergency response guidelines to be implemented during the construction and operation of the Operable Unit-3 (OU-3) groundwater remediation system for the Hooker Chemical/Ruco Polymers Superfund Site (Hooker/Ruco Site) in Hicksville, New York. Figure F1.1 shows the Site location. Although the Hooker/Ruco Site was the point of origin for the chemicals that are being addressed by this remediation, the remedial construction will actually take place on properties owned by others that are downgradient of the Hooker/Ruco Site. As such, reference to the Site includes all areas where the remedy is to be implemented.

The activities to be completed at the Site include the following:

i) mobilization and demobilization of labor, materials, and equipment to the Site;

ii) excavation and drilling activities, some of which will be under or through neighboring streets or roadways;

iii) installation of groundwater monitoring wells and treatment system injection wells;

iv) construction of the control center building;

v) construction of air and liquid supplement injection systems;

vi) treatment system operation and maintenance activities;

vii) groundwater monitoring activities; and

viii) decontamination activities.

These activities will be performed on properties adjacent to or in close proximity to the Hooker/Ruco Site. The project activities to be performed on each property include construction and monitoring activities. The properties include:

i) Northrop Grumman Corporation (Northrop);

ii) Lily Popcorn;

iii) Blackman Plumbing;

iv) Town of Oyster Bay; and

v) Nassau County.

The above properties are hereinafter referred to as "the Site".

During project activities personnel may come in contact with soils groundwater, and waste materials which potentially contain hazardous substances. However, this possibility only exists for the activities associated with the installation of the groundwater monitoring and injection wells that are in excess of 200 feet deep at the north fence and in excess of 300 feet deep at the middle fence. All other construction activities are considered clean construction activities and are not subject to any of the environmental safety aspects that are presented in this H&SP. Those clean construction activities are subject to the general H&SP aspects that are presented herein.

This HASP has been developed to ensure the following:

i) that Site personnel are not adversely exposed to the compounds of concern;

ii) that public health and the environment are not adversely impacted by contaminated materials which may potentially migrate off-Site during work activities at the Site;

iii) compliance with applicable governmental and non-governmental (American Conference of Governmental Industrial Hygienists [ACGIH]) regulations and guidelines. In particular, the amended rules of the Occupational Safety and Health Act (OSHA) for Subpart D of Part 1926 (Title 29 Code of Federal Regulations (CFR) Part 1926.65) will be implemented for all Site work; and

iv) initiation of proper emergency response procedures to minimize the potential for any adverse impact to Site workers, employees of the neighboring facilities, visitors, the general public, or the environment.

For the purpose of this HASP, all project activities performed on Site involving contact with potentially contaminated materials (i.e., deep drilling, deep well installation, and groundwater monitoring) will be considered contaminated operations requiring personal protective equipment (PPE). A detailed description of the PPE required is presented in Section 7.1. All other project activities will follow normal construction protocols for health and safety.

The applicability of this HASP extends to all personnel who will be on-Site, including the on-Site Engineer or Technician, employees of the Site properties while in the work area, contractors, subcontractors, and visitors to the Site properties while in the work area. Contractors who will be conducting project activities will be responsible for the health and safety of their own personnel and the implementation of their own HASP. Contractors' HASPs shall incorporate, at a minimum, the requirements of this HASP. A

copy of the Contractor's HASP, employer-specific Standard Operating Procedures (SOPs), and facility-specific SOPs will be maintained on-Site whenever project activities are in progress.

## 1.1 PROJECT ORGANIZATION

The project activities will be organized as follows: A Project Manager will direct the project and contractor(s) will construct and operate the groundwater remediation system.

Site personnel will include an on-Site Engineer and/or Technician who will be responsible for ensuring that Contract Specifications will be met, including those related to Site health and safety. The contractor will provide the necessary support personnel to complete the project activities. This will include a supervisor, a Health and Safety Officer (HSO), and a field crew of equipment operators, drillers, laborers, and support personnel. Site personnel may serve in more than one job function as long as they are qualified to do so.

The Site properties are active industrial/commercial facilities with inherent conditions not related to the planned project activities. The appropriate individual listed in Section 14.2 will be consulted prior to activity on their property to determine if any safety precautions should be taken in addition to those mentioned herein.

The requirements of these various property owners for Contractors working on their properties are described in Section 14.0 and are included in Attachment F.1 for those property owners who have written procedures.

## 2.0 HISTORICAL INFORMATION

The historical information obtained to date for the Hooker/Ruco, Northrop, and Navy sites and the surrounding region has been reviewed. Sections 2.1 and 2.2 provide a brief description of the Hooker/Ruco Site and its history. Section 2.3 provides a summary of historical site operations at the Hooker/Ruco, Northrop, and Navy facilities. A general description of the hydrogeologic setting beneath the area is provided in Section 2.4.

### 2.1 SITE DESCRIPTION

The Hooker/Ruco Site was an active chemical manufacturing facility located in a heavily industrialized section of Hicksville, Long Island, New York. The plant, currently owned by the Bayer Corporation, contained four buildings for the manufacture and storage of chemical products (Plants 1, 2, 3, and the Pilot Plant) and an administration building. The remainder of the 14-acre site contained parking areas, chemical storage tanks, recharge basins (sumps) and small ancillary structures. The facility manufactured polyester, polyols, and powder coating resins and polyvinyl chloride (PVC). The facility is currently being decommissioned.

Historically, the major industrial facility in the area was the Northrop manufacturing facility and airport. The Northrop plant is now shut down and Northrop is in the process of selling parcels of their property to other parties. Hence, the current pumpage rates needed to supply water to the facilities are much reduced from historical pumpage rates. There are many other small industries, commercial operations, residential areas, utilities, transportation corridors, and storm-water management basins in the area. Figure F1.1 shows the Hooker/Ruco Site and its surroundings. Figure F2.1 presents a detailed layout of the historic plant facilities. Figure F2.2 presents the layout of the biosparging system.

Commerce Street and adjacent industrial development comprise the 880-foot northern site boundary. Along the Site's 1,000-foot eastern side is a large warehouse building formerly-owned by Northrop. A small portion of undeveloped land abuts the site's 250-foot southern property boundary. Two active tracks of the Long Island Railroad parallel the site's 940-foot southwestern property boundary. The Hooker/Ruco Site is bounded on the 270-foot western boundary by New South Road. The property is enclosed by a chain-link fence, which completely encompasses the Hooker/Ruco Site. Four surface-water sumps are located on the Hooker/Ruco Site along the eastern property boundary.

The area surrounding the Hooker/Ruco Site is comprised of an industrialized corridor and residential complexes. Residential dwellings comprise approximately 22 percent of the area and are located southwest of the Hooker/Ruco Site. Approximately 65 percent of the area land use is industrial or commercial.

## 2.2 SITE HISTORY

The Hooker/Ruco Site was developed by the Rubber Corporation of America, a small privately held company. Operations at the Site began in 1945 and included natural rubber latex storage, concentrating, and compounding. Five years later, the plant began producing small volumes of plasticizers. These activities were expanded and modified through the years. In 1956, a polyvinyl chloride (PVC) plant was built, and was initially operated under the name Insular Chemical Corporation. The plant continued in operation until 1975. Hooker Chemical Corporation purchased Rubber Corporation of America in 1965, and operated the facility as the Ruco Division. Hooker has undergone several name changes, with the current name being Occidental Chemical Corporation (OxyChem). The facility was sold to Ruco employees in February 1982. Beginning in 1982, the Hooker/Ruco Site was operated by a privately held corporation under the name Ruco Chemical Corporation, which is not affiliated with OxyChem. In 1998, the name changed to Ruco Polymers, a subsidiary of Sybron Chemicals, Inc. The facility was subsequently purchased by the Bayer Corporation in 2001. In 2003, Bayer demolished the facility and the property is now vacant except for the original office building.

## 2.3 SITE OPERATIONS

Hooker/Ruco Site

Over the life span of the plant, various processes have been employed including the manufacturing of polyesters, polyurethanes, and specialty plasticizers. PVC was produced at the Hooker/Ruco Site until 1975. In 1956, a partnership was formed with Ross & Roberts of Stratford, Connecticut to construct and operate a PVC production facility at the Hicksville site. This venture was known as Insular Chemical Corporation. Insular was later dissolved when Rubber Corporation of America purchased its partner's share. Today, no distinction is made between the property, which was under

the control of Insular, and the property which was owned by Rubber Corporation of America. The Hooker/Ruco Site encompasses all of this property.

Through the years in which OxyChem operated the facility, various processes were employed including the manufacture of polyesters, polyurethanes, and specialty plasticizers. Other products included vinyl film, vinyl sheeting, solution polyurethanes, polyurethane latexes, and dry blends, and pelletized plastic compounds. A pilot plant produced polyester, plasticizer, and polyurethane products, and the laboratory was utilized for organic chemical synthesis and technical service.

During the 1950s and 1960s, the Ruco plant utilized three production wells to provide water to the facility. These three industrial wells correspond to the DEC well numbers 3450, 5368, and 5390. The pumped water was applied in various non-contact facility processes. The total pumpage of these wells ranged from 57 gpm to 324 gpm during the 1950s and from 16 gpm to 140 gpm in the 1960s. The wells were abandoned in 1970. The three wells did not exceed a depth of approximately 150 feet below ground surface (BGS). The wells were shallow by comparison to the Northrop production wells which range in depth from 357 to 570 feet BGS. Recharge basin areas are located along the east side and at the south end of the Hooker/Ruco Site. Stormwater runoff is directed to the basins which have also received process water discharge.

Northrop Site

The Northrop plant was established in the early 1930s and developed a series of naval carrier aircraft and amphibious vehicles. During the 1940s and 1950s, the plant manufactured the Wildcat/Hellcat/Avenger series of aircraft. In the 1960s and 1970s, the plant was involved with several NASA projects including the development of the Orbiting Astronomical Observatory, the ECHO II satellite, the lunar module, and space shuttle components. The plant operations returned to the development of naval aircraft during the 1980s. The plant is presently undergoing closure operations that has resulted in significant property sales to date with additional sales planned.

The facility included numerous buildings, 14 industrial production wells (seven on the Navy property) and five recharge basin areas (one on the Navy property). The location of each Northrop production well is shown on Figure F2.2. The water was primarily used for non-contact cooling although some of the water was applied in the plant processes such as parts rinsing and bath operations. The majority of the water was discharged to the recharge basins following use. The wells were operated primarily on

facility demand and, as a result, the pumping rates were highly variable throughout the year. The water usage was typically greatest during the summer months.

Navy Site

The Navy site was established in 1933 primarily for the purpose of research prototyping, testing, design and fabrication of military aircraft. The Navy property has been used periodically to store hazardous materials and waste products prior to use or disposal. The site consists of six main buildings, a salvage storage area, Northrop's second largest recharge basin area, and seven Northrop production wells. This facility is currently dormant and under demolition and sale, as is the Northrop property.

## 2.4 HYDROGEOLOGIC SETTING

A detailed description of the regional and site-specific hydrogeology is provided in Section 4.0 of the OU-3 RI report which was issued in June 2000. The subsurface conditions for the area are briefly summarized below.

The subsurface conditions beneath the area generally consist of a shallow Upper Glacial aquifer and a deeper Magothy aquifer. The Upper Glacial aquifer consists of glacial outwash sand and gravel deposits that range in thickness from approximately 30 ft to 75 ft. The Magothy aquifer consists of a heterogeneous deposit of sand and gravel interbedded with discontinuous lenses of silty to solid clay. The Magothy aquifer is approximately 600 ft to 650 ft in thickness. A 175-foot thick clay deposit underlies the Magothy aquifer and is considered to represent the lower impermeable boundary of the groundwater flow system. Within the Hooker/Ruco Site vicinity, the Magothy aquifer is the primary source of water for municipal and industrial usage.

Groundwater flow in the Upper Glacial and Magothy aquifers in the vicinity of the three sites generally occurs from north to south. The aquifers are sustained primarily by precipitation recharge and by stormwater runoff and industrial water discharge to recharge basins or sumps. Downward vertical gradients from the Upper Glacial aquifer to the Magothy aquifer are predominant over upward vertical gradients. Groundwater flow directions are influenced significantly by the localized effects of municipal and industrial pumping centers and recharge basins.

## 3.0 SITE CHARACTERIZATION AND POTENTIALLY HAZARDOUS COMPOUNDS

Table F3.1 presents a list of chemical compounds which have been previously detected at the Site in soils and groundwater at and in the vicinity of the Hooker/Ruco Site. The exposure routes and Time Weighted Average (TWA) exposure levels for the various chemical compounds are listed in Table F3.2. These levels are set to protect the health of workers.

In addition to the chemical compounds which are presented in Table F3.1, a list of Tentatively Identified Compounds (TICs) has been compiled for the Hooker/Ruco Site. These compounds have also been identified in the Hooker/Ruco Site soils and represent raw materials or incomplete products associated with the manufacturing process at the Hooker/Ruco Site. Table F3.3 presents a listing of the TICs.

It is to be noted that none of these compounds will be present in any of the soils or groundwater contacted during the remedial construction for this project with the exception of the work associated with drilling and well work which penetrate more than 200 feet deep.

## 4.0 BASIS FOR DESIGN

Regulations set forth by OSHA in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) form the basis of this HASP. Emphasis is placed on Sections 1926.65 (Hazardous Waste Operations and Emergency Response), 1910 Subpart I (Personal Protective Equipment), and 1910 Subpart Z (Toxic and Hazardous Substances). In addition, current Threshold Limit Values (TLVs) formulated by the ACGIH have been considered in the development of the selection of PPE. Some of the specifications within this section are in addition to the OSHA regulations, and reflect the positions of the United States Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH) regarding safe operating procedures at hazardous waste sites.

The health and safety of the employees of the Site properties, the public, Site personnel, and the protection of the environment will take precedence over cost and scheduling considerations for all project work. It is intended that this HASP will be used in conjunction with the on-Site contractor's employer specific SOPs.

## 5.0 RESPONSIBILITIES AND ADMINISTRATION

### 5.1 PROJECT MANAGER, SITE ENGINEER, AND/OR TECHNICIAN, AND CONTRACTOR'S SITE MANAGER

The Project Manager, with the assistance of the on-Site Engineer and/or Technician, will be responsible for the overall implementation and monitoring of the CRA health and safety program by:

i) overseeing that appropriate protective equipment is available and properly used by all personnel, in accordance with the HASP;

ii) overseeing personnel health and safety awareness by providing them with proper training and familiarity with procedures and contingency plans;

iii) overseeing that all personnel are aware of potential hazards associated with the conditions and operations of the Site properties;

iv) supervising and monitoring the safety performance of all personnel to oversee that their work practices are conducted in accordance with the HASP;

v) correcting any work practices or conditions that would expose personnel to possible injury or hazardous condition;

vi) communications with the on-Site HSO;

vii) promptly initiating emergency alerts;

viii) obtaining the appropriate permits and ensuring that all required protective measures are in place for the excavation or tunneling activities that will occur on the public roadways; and

ix) is responsible for supporting and enforcing the MSRMI and Conestoga-Rovers & Associates Corporate Health and Safety Program and Policies.

The Contractor's Site Manager will be similarly responsible for the Contractor's health and safety program.

### 5.2 HSO

The on-Site HSO shall be responsible for all decisions regarding operations and work stoppage due to health and safety considerations. The HSO will have prior experience in working at hazardous waste sites.

The on-Site HSO responsibilities include:

i) supervision and enforcement of safety equipment usage, including the required use of extra equipment if appropriate;

ii) supervision and inspection of equipment cleaning;

iii) supervision of decontamination;

iv) conduct the on-Site personnel safety indoctrination session in potential hazards, personal hygiene principles, safety equipment usage, the project specific Hazard Communication Program, pertinent private property contractor requirements (as applicable), confined space entry procedures, and emergency procedures;

v) maintain Exclusion Zone (EZ) Contaminant Reduction Zone (CRZ) and other work areas;

vi) review and modify the HASP as more information becomes available or conditions warrant;

vii) authority to suspend work activity due to unsafe working conditions;

viii) coordination of emergency procedures;

x) ensure that all on-Site personnel have obtained the required medical examination prior to arrival at the Site and have met the OSHA training requirements (for deep well work only);

xi) will have audit and corrective action responsibilities;

xii) will consult with the project Certified Industrial Hygienist (CIH) prior to changing or modifying the HASP. All amendments to the HASP will be approved in writing by the project CIH;

xiii) conduct brief daily safety meetings; and

xiv) conduct air monitoring activities as necessary.

## 6.0 WORKER TRAINING AND EDUCATION

Prior to commencing Site activities, a Health and Safety/Site Indoctrination Session will be presented. Attendance is mandatory for all personnel who will be or are expected to be involved with the remedy construction and/or operation.

The training program will stress the importance that each attendee understands the basic principles of personnel protection and safety, be able to perform their assigned job tasks in a safe and environmentally responsible manner, and be prepared to respond in an appropriate manner to any emergency which may arise. Background information of the Site properties will be included and the various components of the project HASP will be presented followed by an opportunity to ask questions to ensure that each attendee understands the HASP. Personnel not successfully completing this training program will not be permitted to enter or work in potentially contaminated areas of the Site properties. Personnel successfully completing this training program shall sign an acknowledgment form, a copy of which is presented in Attachment F.2. In addition to this initial site training program, daily safety meetings will be conducted and documented by the HSO. Attachment F.3 presents the Daily Safety Meeting Log that will be used.

This training will be given in addition to the basic training required under OSHA and is not intended to meet the requirements of 29 CFR 1926.65. Prior to working in or entering an EZ environment for deep well work (as defined in Section 7.5), all personnel will be required to provide documentation to the HSO indicating successful completion of the training requirements of 29 CFR 1926.65.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section of the HASP describes the requirements for PPE and the specific levels of protection required for deep well work to be conducted during project activities. The identification and proposed use of specific PPE has been based on a review of the hazard/risk analysis for each project activity. This includes the potential for exposure to the previously detected chemical compounds on Site and the ability of PPE to adequately provide protection against these identified chemical compounds. Decisions were further based on the review of manufacturer's technical data (i.e., E.I. duPont's Tyvek® Protective Clothing Guide, Forsberg and Mandorf's Quick Selection Guide to Chemical Protective Clothing, and MSA's Respirator Guide). The basic PPE requirements for all personnel on Site but not in an active work zone include:

i) full length pants;

ii) safety footwear;

iii) safety glasses with side shields;

iv) reflective safety vest (when exposed to vehicular traffic or excavating equipment);

v) hearing protection devices when exposed to noise above allowable levels; and

vi) hard hats.

### 7.1 PROTECTION LEVELS

Personnel will wear protective equipment when project activities involve potential exposure to Hooker/Ruco, Northrop, or Navy chemicals or when direct contact with potentially hazardous substances may occur (Deep Well Work). Chemical resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals. Respirators protect lungs, the gastrointestinal tract, and if a full-face respirator is worn, the eyes, against airborne toxicants. Respiratory protection levels will be based on the potential presence of the chemical compounds previously detected at the Hooker/Ruco, Northrop, or Navy Sites.

The specific protection levels to be employed for each work task are listed in Table F7.1. All project activities conducted will require the use of one of the following levels of PPE.

Level B: (Not expected to be worn)

i) supplied air respirator (MSHA/NIOSH approved). Respirators may be positive pressure-demand, self-contained breathing apparatus (SCBA) or positive pressure-demand airline respirator (with escape bottle for Immediate Danger to Life and Health (IDLH) or potential for IDLH atmosphere);

ii) polycoated tyvek® or saranex® coveralls;

iii) steel toe work boots and disposable boot covers or rubber boots;

iv) disposable inner gloves - chemical resistant;

v) outer work gloves - chemical resistant;

vi) hearing protection and reflective safety vests as necessary; and

vii) hard hat.

Level C:

i) tyvek® if dry conditions or polycoated tyvek® or saranex® coveralls if working with water;

ii) steel toe work boots and disposable boot covers or rubber boots;

iii) disposable inner gloves - chemical resistant;

iv) outer work gloves - chemical resistant;

v) full-face air purifying respirator (APR), equipped with combination cartridges for organic vapors/acid gases and particulates (P-100);

vi) hearing protection and reflective safety vests as necessary; and

vii) hard hat.

Modified Level D:

i) tyvek® if dry conditions or polycoated tyvek® or saranex® coveralls if working with water;

ii) steel toe work boots;

iii) disposable inner gloves - chemical resistant;

iv) outer work gloves - chemical resistant;

v) safety glasses;

vi) splash shields as necessary;

vii) hearing protection and reflective safety vests as necessary; and

viii) hard hat.

Level D:

i) standard work uniform or coveralls;

ii) steel toe work boots;

iii) gloves as necessary;

iv) safety glasses with side shields;

v) splash shield as needed;

vi) hearing protection and reflective safety vests as necessary; and

vii) hard hat.

PPE will be maintained in a clean sanitary condition and ready for use. Disposable coveralls shall be discarded when torn and as personnel leave the contaminated work zone. Hard hats shall be thoroughly cleaned after leaving the contaminated work zone. Respirators shall be cleaned after each day's use and cartridges discarded. A sufficient quantity of potable water shall be supplied for washing, cleaning PPE and drinking. A potable water supply for washing and cleaning PPE will be maintained adjacent to the decontamination area described in Section 10.0. Fresh potable water for drinking will be supplied on a daily basis and be maintained at a location removed from the active work area. Protection levels provided by PPE selection shall be upgraded or downgraded based upon a change in Site conditions.

All proposed changes to protection levels and PPE requirements will be reviewed and approved prior to their implementation by the HSO, CIH and Project Manager.

## 7.2 DURATION OF WORK TASKS (DEEP WELL WORK AND GROUNDWATER MONITORING)

The duration of project activities involving the usage of PPE will be established by the HSO based upon ambient temperature and weather conditions, the capacity of personnel to work in the designated level of PPE (heat stress, see Section 13.3), and limitations of the protective equipment (i.e. ensemble permeation rates, life expectancy of air-purifying respirator cartridges, etc.). As a minimum, rest breaks will be observed at the following intervals:

i) 15 minutes midway between shift startup and lunch;

ii) 1/2 to 1 hour for lunch; and

iii) 15 minutes in the afternoon, between lunch and shift end.

All rest breaks will be taken in a clean area (e.g., support zone) after full decontamination and PPE removal. Additional rest breaks will be observed, based upon the heat stress monitoring guidelines presented in Attachment F.5. It is anticipated that work shift durations will be variable and could extend to as long as 12 hours per day.

## 7.3 LIMITATIONS OF PROTECTIVE CLOTHING (DEEP WELL WORK AND GROUNDWATER MONITORING)

PPE ensembles designated for use during project activities have been selected to provide protection against the known or suspected chemicals in the soil and groundwater. No protective garment, glove or boot is chemical-proof, nor will it afford protection against all chemical types. Permeation of a given chemical through PPE is a complex process governed by chemical concentrations, environmental conditions, physical condition of the protection garment, and the resistance of a garment to a specific chemical; chemical permeation may continue even after the source of the chemical has been removed from the garment.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all personnel using PPE:

i) when using disposable coveralls, don a new clean garment after each rest break or at the beginning of each shift;

ii) inspect all clothing, gloves and boots both prior to and during use for:

   a) imperfect seams,

   b) non-uniform coatings,

   c) tears, and

   d) poorly functioning closures; and

iii) inspect reusable garments, boots and gloves both prior to and during use for:

   a) visible signs of chemical permeation,

   b) swelling,

c) discoloration,

d) stiffness,

e) brittleness,

f) cracks,

g) any sign of puncture, and

h) any sign of abrasion.

Reusable gloves, boots or coveralls exhibiting any of the characteristics listed above will be discarded.

Additional PPE usage guidelines are as follows:

i) ankles/wrists will be secured tightly with the use of duct tape;

ii) prescription eyewear used on Site shall be safety glasses equipped with side shields when full-face respirators are not required. Contact lenses shall not be used;

iii) all EZ workers will have received training in the usage of full-face air purifying respirators and supplied air respiratory protection equipment; and

iv) steel toe leather footwear shall be covered with neoprene overboots prior to entering the EZ and immediately upon entering the CRZ.

EZ personnel also carry certain responsibilities for their own health and safety, and are required to observe the following safe work practices:

i) familiarize themselves with this HASP;

ii) use the "buddy system" when working in a contaminated work zone;

iii) use the safety equipment in accordance with training received, labeling instructions and common sense;

iv) maintain safety equipment in good condition and proper working order;

v) refrain from activities that would create additional hazards (i.e. smoking, eating, etc., in restricted areas, leaning against dirty, adversely impacted surfaces);

vi) smoking and eating will be prohibited except in designated areas. These designated areas may change during the duration of the project to maintain adequate separation from the active work area(s). Designation of these areas will be the responsibility of the HSO; and

vii) soiled disposable outerwear shall be cleaned, removed, and either left in a safe place until reuse or placed into a covered container prior to washing hands and face, eating, using lavatory facilities or leaving the work area.

## 7.4 RESPIRATORY PROTECTION PROGRAM (DEEP WELL WORK AND GROUNDWATER MONITORING)

Prior to arriving at the Site, all on-Site personnel will have received training in the use of, and have been fit tested for a full-facepiece respirator. All on-Site personnel will be required to comply with their employer specific written respiratory protection program developed in accordance with OSHA 29 CFR 1910.134.

Respiratory protection may be required during some of the project activities. This is to protect workers from the potential harmful affects of organic vapors. A photoionization detector (PID) will be available at the Site and used by the HSO. The action levels to determine the level of respiratory protection necessary during project activities is based on the anticipated concentrations of Site chemicals measured within worker breathing zones. The action levels and appropriate respiratory protection for project activities are as follows:

| *Sustained Organic Vapor Reading Above Background within Worker Breathing Zone in Parts Per Million (ppm)* | *Action Taken* |
|---|---|
| 0 or background | Full-face respirator available |
| 1-250 | Wear full-face respirator |
| >250 | Shutdown operations implement engineering controls, upgrade to supplied air respiratory protection |

The appropriate air purifying respirator cartridge to be used is a combination organic vapor/acid gases and particulate filter cartridge (P-100). The cartridge used must be of the same manufacturer as the respiratory face piece.

## 7.5 SITE CONTROL

Designated work areas will be set up as appropriate during project activities, as required. The purpose of these procedures is to limit access to potentially adversely

impacted areas, and prevent the migration of potentially hazardous materials into adjacent non-impacted areas. These areas are described in the following.

i) The Exclusion Zone (EZ): is the area immediately surrounding the active work area. Sufficient area will be provided for efficient movement of personnel and equipment as well as chemical control. Boundaries are modifiable depending on operational requirements. The HSO will be responsible for maintaining the boundaries of this area. Personnel entering this area are required to wear the PPE as defined previously. A wind direction indication device (i.e. flagging, windsock, etc.) will be mounted in the area of any EZ during excavation and well installation activities.

All personnel (including visitors) entering the EZ or CRZ using respiratory protection must have successfully passed a qualitative respirator FIT test in accordance with OSHA 29 CFR 1910.134. Documentation of FIT testing is the responsibility of each employer.

In the event that unauthorized personnel enter the EZ, work will stop. Work will not resume until the unauthorized personnel have been removed from the EZ or have been moved to an acceptable on-Site area. A log of all visitors to the work areas at the Site properties, including those entering the EZ, will be maintained.

ii) The Contaminant Reduction Zone (CRZ): will provide a location for removal of used PPE and final removal and decontamination of personnel and equipment. Supplemental safety equipment, such as fire extinguishers, portable eyewash and extra quantities of PPE may be stored in this area. The order in which safety equipment is to be donned is as follows:

a) tyvek®, polycoated tyvek®, or saranex®;

b) rubber boot;

c) gloves;

d) respirator (if required); and

e) hard hat.

The following order applies when removing safety equipment:

a) wash off boots, and outer gloves prior to removal;

b) tyvek®, polycoated tyvek®, or saranex®;

c) hard hat;

d) respirator; and

e) inner gloves.

iii) The Support Zone (SZ): is situated in clean areas where there is a minimal risk of encountering hazardous materials or conditions. PPE beyond the basic requirements is therefore not required.

## 8.0 ACTIVITY HAZARD/RISK ANALYSIS

This section identifies the general hazards associated with specific project activities and presents the documented or potential health and safety hazards that exist at the Site properties. Every effort will be made to reduce or eliminate these hazards. Those which properties cannot be eliminated must be guarded against by use of engineering controls and/or PPE. Table F8.1 presents the anticipated hazards/risks and appropriate precautions.

In addition to the chemical hazards presented in Section 3.0 of this HASP, physical hazards including trip and fall hazards, slippery surfaces, the use of drilling and excavating equipment, steel erection, the use of decontamination equipment, potential exposure to vehicular traffic, and potential heat and cold stress exist at the Site.

For those Site personnel who are involved with O&M activities, potassium permanganate is used on Site as part of the treatment process. The HSO will train all Site personnel in the proper handling procedures for potassium permanganate according to the MSDS.

It will be the responsibility of each on-Site contractor and their personnel to identify the physical hazards posed by the various Site project activities and implement preventative and corrective action.

### 8.1 CHEMICAL EXPOSURE (DEEP WELL WORK AND GROUNDWATER MONITORING)

Preventing exposure to toxic chemicals is a primary concern. Chemical substances can enter the unprotected body by inhalation, skin absorption, and ingestion. A chemical can cause damage at the point of contact or can act systemically, causing a toxic effect at a part of the body distant from the point of initial contact.

Chemical exposures are generally divided into two categories: acute and chronic. Symptoms resulting from acute exposures usually occur during or shortly after exposure to a sufficiently high concentration of a chemical. The concentration required to produce such effects varies widely from chemical to chemical. The term "chronic exposure" generally refers to exposures to "low" concentrations of a chemical over a long period of time. The "low" concentrations required to produce symptoms of chronic exposure depend upon the chemical, the duration of each exposure, and the number of

exposures. For a given chemical, the symptoms of an acute exposure may be completely different from those resulting from chronic exposure.

For either chronic or acute exposure, the toxic effect may be temporary and reversible, or may be permanent (disability or death). Some chemicals may cause obvious symptoms such as burning, coughing, nausea, tearing eyes, or rashes. Other chemicals may cause health damage without any such warning signs (this is a particular concern for chronic exposures to low concentrations). Health effects such as cancer or respiratory disease may not become manifest for several years or decades after exposure. In addition, some toxic chemicals may be colorless and/or odorless, may dull the sense of smell, or may not produce any immediate or obvious physiological sensations. Thus, a worker's senses or feelings cannot be relied upon in all cases to warn of potential toxic exposure.

The effects of exposure not only depend on the chemical, its concentration, route of entry, and duration of exposure, but may also be influenced by personal factors such as the individual's smoking habits, alcohol consumption, medication use, nutrition, age, and sex.

An important exposure route of concern at the Site is inhalation. The lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body. Some toxic chemicals present in the atmosphere may not be detected by human senses (i.e. they may be colorless, odorless, and their toxic effects may not produce any immediate symptoms). Respiratory protection is therefore extremely important if there is a possibility that the work site atmosphere may contain such hazardous substances. Chemicals can also enter the respiratory tract through punctured eardrums. Where this is a hazard, individuals with punctured eardrums should be medically evaluated specifically to determine if such a condition would place them at an unacceptable risk and preclude their working at the task in question.

Direct contact of the skin and eyes by hazardous substances is another important route of exposure. Some chemicals directly injure the skin. Some pass through the skin into the bloodstream where they are transported to vulnerable organs. Skin absorption is enhanced by abrasions, cuts, heat, and moisture. The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye). Wearing protective equipment, not using contact lenses (since they may trap chemicals

against the eye surface), keeping hands away from the face, and minimizing contact with liquid and solid chemicals can help protect against skin and eye contact.

Although ingestion should be the least significant route of exposure at the four facilities, it is important to be aware of how this type of exposure can occur. Deliberate ingestion of chemicals is unlikely, however, personal habits such as chewing gum or tobacco, drinking, eating, smoking cigarettes, and applying cosmetics may provide a route of entry for chemicals.

## 8.2 UNDERGROUND UTILITIES

Close attention needs to be paid with locating underground utilities and avoiding any penetration of them during construction activities. Attachment F.6 presents a Utility Clearance Form that will be used to identify and locate all underground obstructions. Responsible parties will be asked to sign off on this form.

## 8.3 COMPRESSED AIR

Project activities will require Site personnel to work with high pressure compressed air. Conestoga-Rovers & Associates has developed some procedures for the safe handling and usage of compressed air. These written procedures are included in Attachment F.4 and will be available on-Site during project activities that entail the use of compressed air. The HSO will be responsible for training all required personnel to the appropriate safety procedures.

## 8.4 CLEARANCES FOR ENERGIZED OVERHEAD ELECTRICAL LINES

Any vehicle or mechanical equipment capable of having parts of its structure near energized overhead lines shall be operated so that a clearance of 10 feet is maintained. If the voltage is higher than 50 kV, the clearance shall be increased 4 inches for every 10 kV over 50 kV.

## 8.5 WORKING ON OR NEAR PUBLIC ROADWAYS

Some of the construction and installation activities may be setup near, on, or under public streets or in active plant areas which represent additional hazards, i.e., being

struck by vehicles, individuals gathering in the area to watch project activities, stray dogs, etc., for project personnel. The following precautions will be taken:

i) the project management team will contact the local community/plant authorities to determine if there are any permits or special equipment or procedures that are required for this work. They will also develop a Temporary Traffic Control Plan and design and set up a Temporary Traffic Control Zone. See Attachment F.8 for a Temporary Traffic Control Plan Template;

ii) all project personnel exposed to vehicular traffic shall wear a Class II or III reflective safety vest;

iii) the appropriate traffic control signs shall be set in place including warning signs that may state "Men Working Ahead";

iv) barriers will be set in place that will not allow project personnel to accidentally walk out into passing traffic. Barrier tape will not be acceptable;

v) the use of a flagman (or flagmen) will be evaluated at each location;

vi) barrier tape or other type of barrier system may be set up at each location to keep the public at a safe distance; and

vii) the HSO will discourage anyone from gathering around the perimeter of the work area.

## 8.6 HOT WORK

The remedy construction will involve hot work consisting of pipe cutting and welding. Prior to any hot work being performed, the Contractor will obtain a hot work permit from the Site property owner and comply with all hot work procedures.

## 9.0 AIR MONITORING (DEEP WELL WORK AND GROUNDWATER MONITORING )

During the progress of project activities, periodic real-time monitoring of organic vapors levels will be taken by the HSO. A photoionization detector (PID) equipped with an 11.7 eV lamp will be used for this monitoring.

The PID will be calibrated on a daily basis in accordance with the manufacturer's guidelines, and such calibrations will be recorded in the Site daily log book. Results of all daily air monitoring also will be recorded in the Site daily log book and copies are to be given to the Site Engineer or Technician.

Air monitoring will be conducted in the breathing zone of workers in the EZ and at the downwind perimeter of the appropriate facility on an hourly basis or as deemed necessary by the HSO based on Site-specific conditions. Section 7.4 presents the respiratory action levels for organic vapors. Table F.7.1 presents the specific personal protection levels. Background measurements immediately upwind of the EZ will be taken before activities commence. Work activities generating organic vapor levels greater than 5 ppm above background at the downwind perimeter of the appropriate facility, will temporarily be halted until alternate work methods or engineering controls are in place to maintain organic vapor levels below 5 ppm above background at the downwind perimeter of the Site.

Immediately upon identifying sustained elevated levels of organic vapors (greater than 250 parts per million (ppm) within the Work Zone, the air monitoring results will be reported to the Site Engineer or Technician and work activities will be shutdown. The HSO will determine the cause of the sustained elevated levels of organic vapors and alternate work methods or engineering controls will be implemented to rectify the release of elevated concentrations of organic vapors, or upgrade levels of PPE as required.

## 10.0 DECONTAMINATION PROCEDURES (DEEP WELL WORK AND GROUNDWATER MONITORING)

In general, everything that enters the EZ at this Site must either be decontaminated or properly discarded upon exit from the EZ. All personnel, including any Federal, State, or local official must enter and exit the EZ through the decontamination area. Prior to demobilization, potentially contaminated equipment will be decontaminated and inspected by the HSO before it is moved into the clean zone. Any material that is generated by decontamination procedures will be stored in a designated area in the EZ until disposal arrangements are made.

The type of decontamination solution to be used is dependent on the type of chemical hazards. The decontamination solution for this Site is Liqui-nox (soap) for equipment and for any reusable PPE. The HSO will maintain copies of all Material Safety Data Sheets (MSDS).

### 10.1 EQUIPMENT DECONTAMINATION PROCEDURES (DEEP WELL WORK AND GROUNDWATER MONITORING)

All equipment must be decontaminated within the CRZ by a high pressure water cleaner upon exit from the EZ. Decontamination procedures should include: knocking soil/mud from machines; water rinsing using a solution of water and Liqui-nox; and a final water rinse. Final decontamination of equipment, upon completion of activities, will take place on a temporary decontamination wash pad which will be constructed at the Site. Figure F10.1 presents a typical medium duty decontamination pad. Conestoga-Rovers & Associates has found the construction and operational use of a decontamination pad built to these specifications to be suitable for equipment decontamination activities. Personnel shall wear the personal protection specified in Table F7.1 when decontaminating equipment. Runoff will be collected and stored until appropriate disposal arrangements are made. Following decontamination and prior to exit from the EZ, the HSO shall be responsible for ensuring that the item has been sufficiently decontaminated. This inspection shall be included in the Site log.

### 10.2 PERSONNEL DECONTAMINATION PROCEDURES (DEEP WELL WORK AND GROUNDWATER MONITORING)

The following describes the procedures to be followed by all personnel when leaving the EZ.

Station 1: Equipment Drop

Deposit equipment used on-Site (tools, sampling devices and monitoring instruments, radios, etc.) on plastic drop cloths. These items must be decontaminated or discarded as waste prior to removal from the EZ.

Station 2: Outer Boot and Outer Glove Wash and Rinse

Scrub outer boots, outer gloves and/or splash suit with decontamination solution or detergent wash. Rinse off using water.

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves. If outer boots are disposable, deposit in a covered container. If non-disposable, store in a clean dry place.

Station 4: Outer Garment Removal

Remove outer garments and deposit in a covered container. Decontaminate or dispose of splash suits as necessary.

Station 5: Respiratory Protection Removal

Remove hard hat and facepiece, and deposit on a clean surface. Air purifying respirator cartridges will be discarded as appropriate. Wash and rinse respirator at least daily. Wipe off and store respiratory gear in a clean, dry location.

Station 6: Inner Glove Removal

Remove inner gloves. Deposit in a covered container for disposal.

Station 7: Field Wash

Thoroughly wash hands and face with soap and water.

## 11.0 GENERAL SAFETY AND PERSONAL HYGIENE

1. Eating at the Site properties is prohibited except in specifically designated areas. Designation of eating areas will be the responsibility of the HSO. The location of these areas may change during the duration of the project to maintain adequate separation from the active work area(s).
2. Smoking at the Site properties is prohibited except in specifically designated areas.
3. Individuals getting wet to the skin with effluent from the washing operation must wash the affected area immediately. If clothes in contact with skin are wet, then these must be changed.
4. Hands must be washed with soap and water before eating, drinking, smoking and before using toilets at the facilities provided.
5. Waste will be properly stored until such time that it is disposed of during completion of project activities.
6. All project personnel who will don respiratory protection equipment shall be clean shaven.

## 12.0 MEDICAL SURVEILLANCE (DEEP WELL WORK AND GROUNDWATER MONITORING)

In accordance with the requirements detailed in 29 CFR 1926.65 and 29 CFR 1910.134, all project personnel who will come in contact with potentially adversely impacted materials will have received medical surveillance by a licensed physician or physician's group.

Medical records for all on-Site personnel will be maintained by their respective employers. The medical records will detail the tests that were taken and will include a copy of the consulting physician's statement regarding the tests and the employee's suitability for work.

The medical records will be available to the employee or his designated representative upon written request, as outlined in 29 CFR 1910.1020.

Certifications that personnel involved in Site activities have all necessary medical examinations will be provided to the HSO prior to commencing work which requires respiratory protection or potential exposure to hazardous materials. Personnel not obtaining medical certification will not perform work within contaminated areas.

Interim medical surveillance will be completed if an individual exhibits poor health or high stress responses due to any Site activity or when accidental exposure to elevated concentrations of chemicals occur.

## 13.0 ENVIRONMENTAL CONTROL PROGRAM

This section of the HASP outlines measures to be implemented at the Site to prevent hazards associated with environmental conditions.

### 13.1 WEATHER MONITORING

The HSO will be responsible for checking weather forecasts for the next day and week of work to provide advance notification of any severe weather conditions and implementing appropriate emergency response procedures. Severe weather conditions (e.g., heavy rain) may cause unsafe conditions at the Site properties and in some situations work may have to be stopped.

### 13.2 RAIN

Excessive amounts of precipitation including rain and/or snow may cause potential safety hazards for all work tasks. The hazards would be most commonly associated with slipping, tripping or falling due to slippery surfaces and further hazards are detailed by work task (Table F8.1).

Severe weather conditions will result in work stoppage and the implementation of further emergency measures, as described in Attachment F.7 of the HASP. This attachment discusses emergency procedures that may be implemented during thunder storms, tornadoes, and winter storms.

### 13.3 TEMPERATURE

The project activities may be conducted year round. Low and high temperatures may be experienced which require measures to be implemented to prevent health and safety hazards from occurring. The potential hazards arising from temperature extremes are heat and cold exposure.

The potential hazard due to worker heat stress is particularly important if high protection levels of PPE are in use (e.g., respirators). A detailed monitoring program and prevention measures to implement to reduce heat stress are detailed in Attachment F.5. It is the responsibility of the HSO to determine which measures are

appropriate to implement to prevent heat stress; these will depend largely on daily Site conditions.

Exposure to cold is similar to heat stress in that the HSO must determine the appropriate preventative measures to implement. Some of the measures which may be implemented include: more frequent breaks, additional clothing and partial enclosure of work areas. Detailed cold exposure prevention measures are also included in Attachment F.5.

## 13.4 WIND

High winds may be encountered at the four facilities and these can cause hazards that may affect Site personnel health and safety. Preventative measures that will be implemented if necessary are as follows:

i) restricted Site activity;

ii) battening down light equipment or building materials;

iii) partially enclosing work areas; and

iv) reduction or stoppage of work activities.

## 14.0 EMERGENCY CONTINGENCIES

It is essential that Site personnel be prepared in the event of an emergency. Emergencies can take many forms; illnesses or injuries, chemical exposure, fires, explosions, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information should be posted as appropriate. It should be noted that the surrounding Site properties may have specific requirements for contractors working at their facilities. These procedures include requirements for handling emergency situations. All Site property owners expect the Contractor to let the contacts listed below know when Contractor personnel are at their respective facility and contact them for direction in the event of any emergency situation. Attachment F.1 presents the various contractor procedures to be implemented at the surrounding Site properties. In the absence of plant/facility participation in an emergency situation, the following responsibilities and procedures shall be implemented.

### 14.1 EMERGENCY CONTACTS

| | |
|---|---|
| Fire: | 911 |
| Police: | 911 |
| Ambulance: | 911 |
| Hospital: | Central General Hospital<br>(516) 681-8900<br>Ext. 2335 - Emergency Room |
| Directions to Hospital: | Follow the route and directions which are outlined on Figures F14.1 and F14.2, respectively. Travel time to hospital will range from approximately10 to 20 minutes depending on traffic. |

## 14.2 ADDITIONAL EMERGENCY NUMBERS

CRA Field Representative (to be determined)----------
---------- cell phone 610-476-2594
Bayer Corporation (Mr. Joel Robinson) ---------- 412-777-4871
Occidental Chemical Corporation (Mr. Stephen Whyte) ---------- 859-543-2151
Remedial Action Construction Contractor (to be provided when selected)----------
United States Environmental Protection Agency
(Mr. Syed Quadri) ---------- 212-637-4233
United States Environmental Protection Agency (Hotline) ---------- 800-424-9346
National Response Center ---------- 800-424-8802
Hicksville Fire Department ---------- 516-931-0026
Nassau County Police 8th Precinct ---------- 516-535-6800
Nassau County Poison Control ---------- 516-542-2323
Nassau County Department of Health ---------- 516-535-3410 (day hours)
Northrop (Mr. Larry Leskovjan) ---------- 516-575-2333
Blue Flame Energy (Tom Dunn) ---------- 516-931-6700
Blackman Plumbing (_____) ----------
Lily Popcorn (Dan Parnizari) ---------- 516-576-0718 x-174
Primary Hospital/Central General Hospital ----------516-681-8900 (Ext. 2335)
New York State Department of Environmental
Conservation (Albany) ---------- 800-457-7362
Underground Facilities Protection Organization
(One Call for Long Island) ---------- 800-272-4480

## 14.3 EMERGENCY EQUIPMENT AVAILABLE ON SITE

| *Equipment* | *Location* |
|---|---|
| *Communication* | CRZ. Emergency alarms/horns, cellular phones, and/or radios. |
| *Medical* | OSHA approved first aid kit sized for a minimum of five people. Portable emergency eyewash. |
| *Fire Fighting* | A minimum of two 20-pound ABC type dry chemical fire extinguisher in the CRZ. |

A minimum of two 20-pound ABC type dry chemical fire extinguisher on each piece of equipment.

Communication between work areas and the support zone will be via verbal communication, auto horn, or two-way radio. The HSO will use the nearest telephone on Site or may be in the possession of a mobile telephone to communicate with plant/facility, outside emergency, and medical facilities.

The following signals shall be established for use with auto or compressed air-type horns:

i) 1 Long Blast (2-Second Duration): evacuate exclusion zone, meet at CRZ or designated area;
ii) 1 Long Blast with 2 Short Blasts: prepare for removal of injured personnel, evacuate work area; and
iii) 3 Short Blasts: all clear.

The following hand signals will be used by downrange field teams in conjunction with the "buddy" system. These signals are very important when working with drilling equipment. They shall be known by the entire field team before operations commence.

| *Signal* | *Meaning* |
|---|---|
| • Hand Gripping Throat | Out of Air; Can't Breathe |
| • Grip Partner's Wrist | Leave Area Immediately |
| • Hands on Top of Head | Need Assistance |
| • Thumbs Up | Ok, I'm All Right, I Understand |
| • Thumbs Down | No, Negative |

All emergency equipment and hand signals will be checked and/or practiced regularly to make sure that it is in good working order and hand signals are understood.

## 14.4 PROJECT PERSONNEL RESPONSIBILITIES DURING EMERGENCIES

HEALTH AND SAFETY OFFICER (HSO)

As a primary on-Site administrator of the project, the HSO has responsibility for responding to and correcting emergency situations. The HSO will:

i) take appropriate measures to protect personnel including: withdrawal from the EZ, total evacuation and securing of the Site, or upgrading or down-grading the level of protective clothing and respiratory protection;

ii) take appropriate measures to protect the public and the environment including isolating and securing the work area, preventing runoff to surface waters, and ending or controlling the emergency to the extent possible;

iii) ensure that appropriate Plant, Federal, State and local agencies are informed, and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. In the event of an air release of toxic materials, the local authorities should be informed in order to assess the need for evacuation;

iv) ensure that appropriate decontamination, treatment, or testing for exposed or injured personnel is obtained;

v) determine the cause of the incident and make recommendations to prevent the recurrence; and

vi) ensure that all required reports have been prepared.

## 14.5 MEDICAL EMERGENCIES

Any person who becomes ill or injured in the EZ must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed as much as possible without causing further harm to the patient. First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the HSO. There will be at least one individual certified in First Aid/CPR available on-site while project activities are being conducted.

Any vehicle used to transport ill or injured personnel, will be cleaned or decontaminated as necessary.

## 14.6 FIRE OR EXPLOSION

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the HSO or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on Site.

If it is safe to do so, Site personnel may:

i) if hazardous, report to the Agency On-Scene Coordinator and/or Project Manager;

ii) use fire fighting equipment available on Site; or

iii) remove or isolate flammable or other hazardous materials which may contribute to the fire.

## 14.7 SPILL CONTROL AND RESPONSE PLAN

During the operation of the groundwater remediation system, a Spill Control and Response Plan will be in effect. This plan, as presented herein, will provide contingency measures for potential releases of material from tanks or containers handled at the Site.

The following equipment will be available on-Site and used for any unexpected spills:

i) non-combustible absorbent;

ii) hoses and water supply;

iii) disposal containers (e.g., 55-gallon DOT-approved drums);

iv) shovels; and

v) an appropriate pump.

Hand tools which are used will generally be discarded with the waste and/or contaminated material unless it is determined appropriate to decontaminate the tools. If tools are decontaminated, they will receive a detergent wash in addition to pressurized water cleaning.

In the event a drum or container of liquid is spilled outside of a containment area, Site personnel will immediately respond to the spill. The spilled liquids will be confined to the immediate area of the spill and the liquids will be pumped, with the use of a portable pump, into a repack drum, or other appropriate tank or washed down if appropriate. The spilled liquids will be confined by diking around the spill with native material or with an inert absorbent. Any residual liquids which cannot be pumped will be absorbed with a sufficient quantity of inert absorbent to ensure that no free liquids remain. If the spill occurred on soil, the visibly affected soil will be excavated to limits based on a visual determination of spill contamination. The absorbent and excavated material will be drummed for proper disposal. Spills in a containment area will simply be washed to the floor sump where they are collected.

If a major release of material stored in a tank or container occurs in the Control Building, the following actions will immediately be taken:

i) take immediate measures to control and contain the release;

ii) keep unnecessary personnel away; isolate the area of release and deny entry;

iii) do not allow anyone to touch released material;

iv) stay upwind; keep out of low areas; and

v) notify the MSRMI Project Manager.

An employee alarm system will be used as necessary to signify a major release or an emergency and will consist of three short blasts using an air horn. An air horn will always be maintained in the CRZ.

## 15.0 RECORD KEEPING

The HSO shall establish and maintain records of all necessary and prudent monitoring activities as described below:

i) name and job classification of the employees involved on specific tasks;

ii) records of qualitative fit testing and proof of medical surveillance for Site personnel;

iii) records of all OSHA training certification for Site personnel;

iv) records of training acknowledgment forms; and

v) emergency report sheets describing any incidents or accidents.

# FIGURES

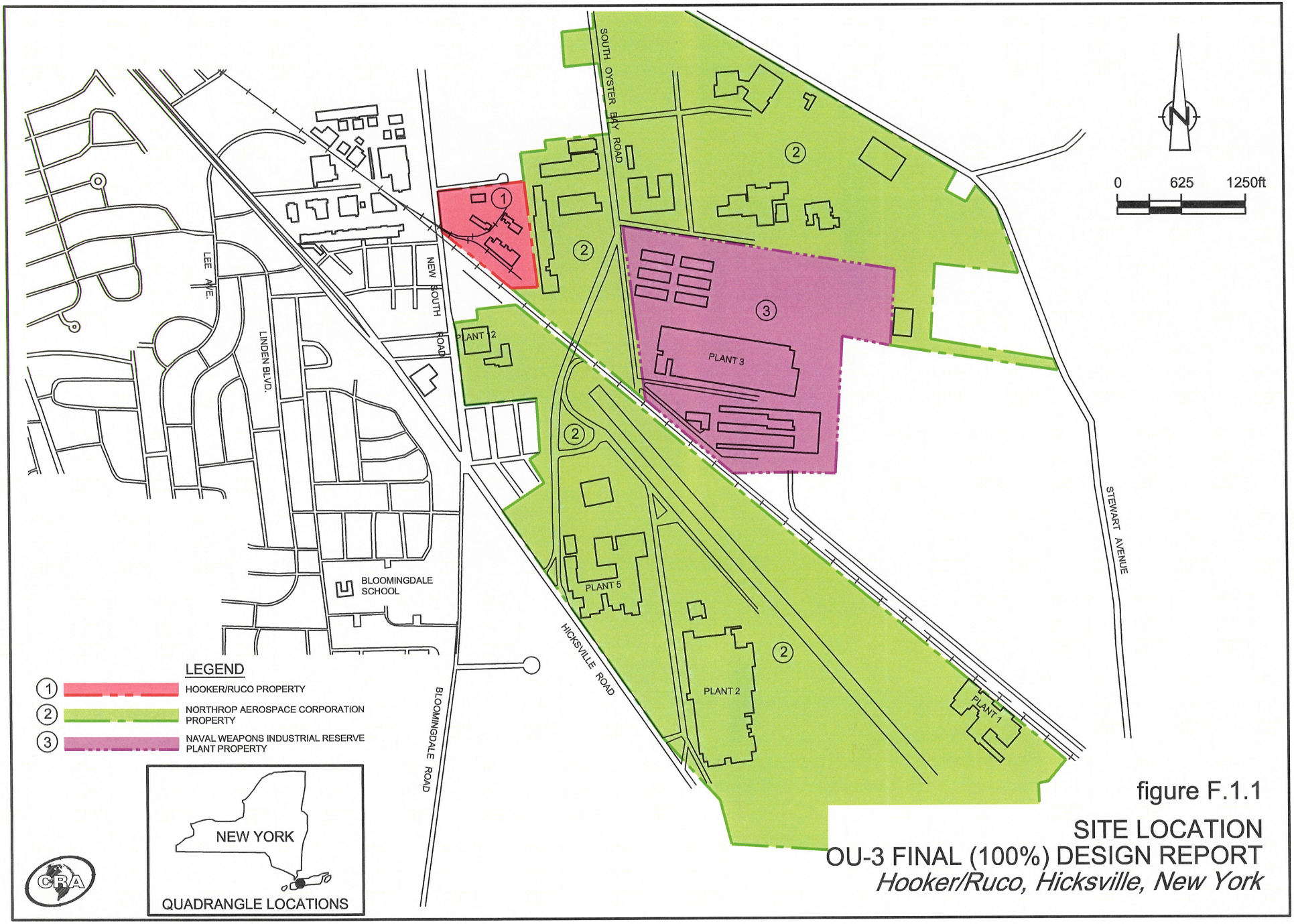



figure F.1.1

SITE LOCATION
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco, Hicksville, New York*

06883-95(045)GN-WA010 MAR 11/2005

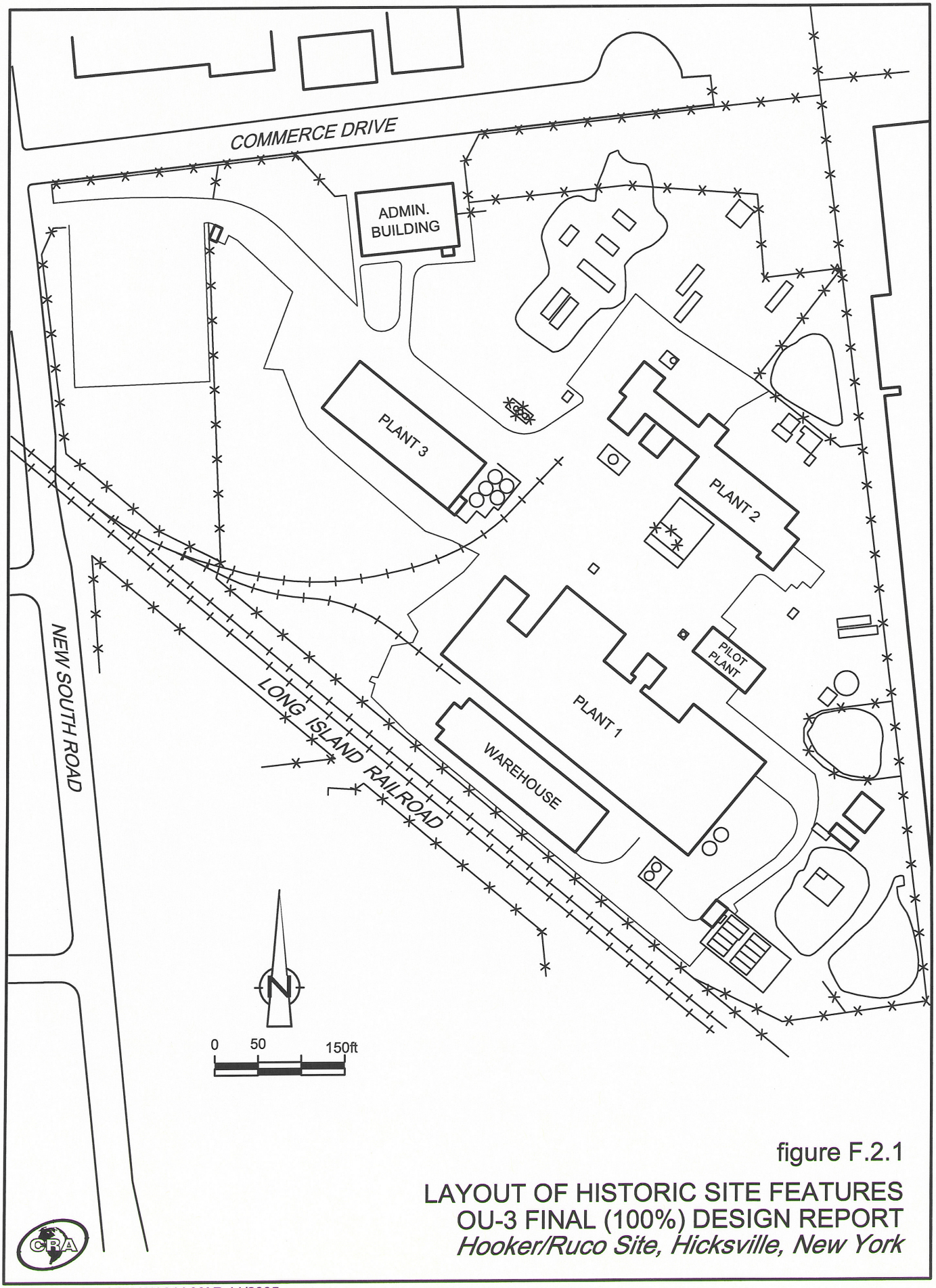
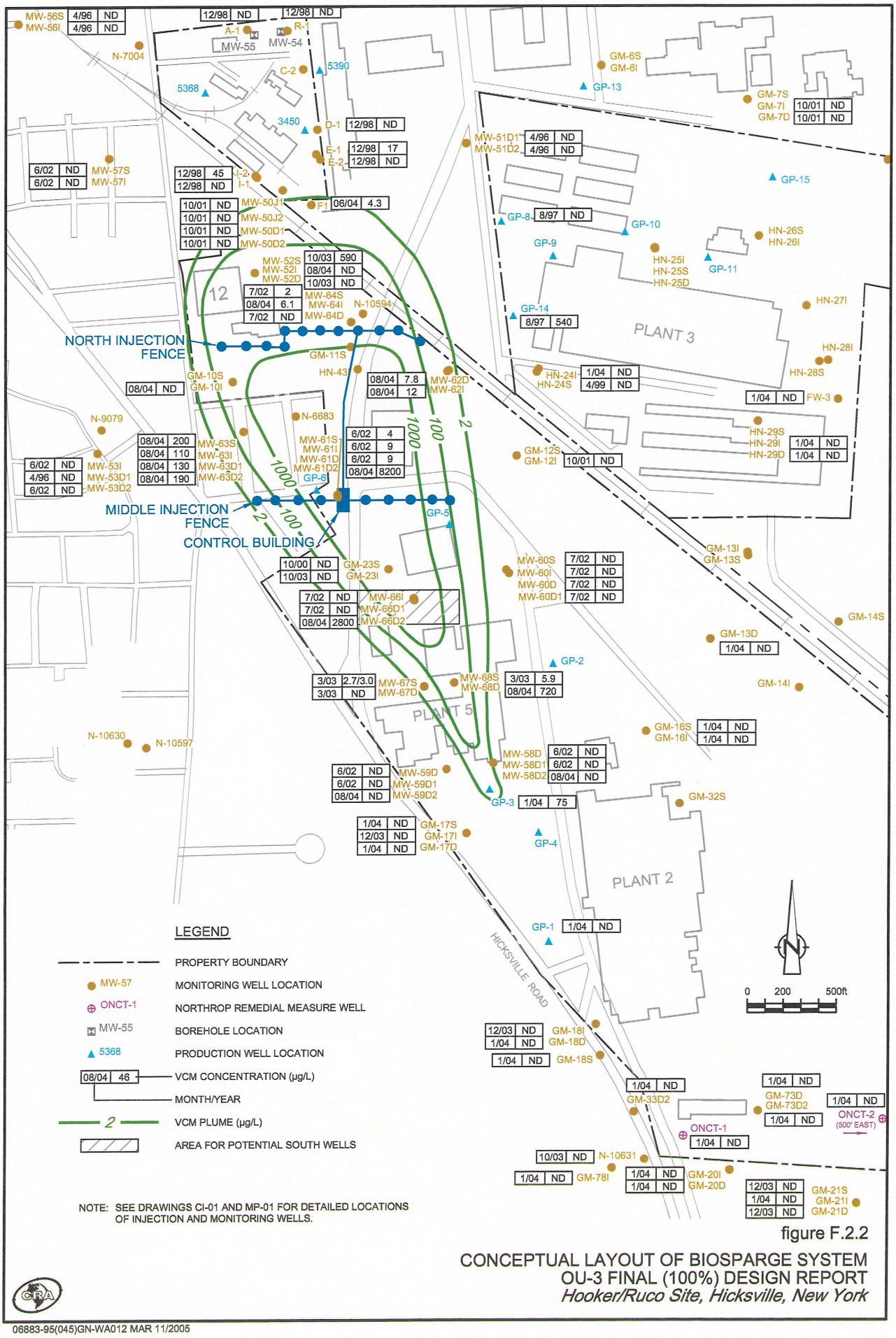



figure F.2.1

LAYOUT OF HISTORIC SITE FEATURES
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco Site, Hicksville, New York*

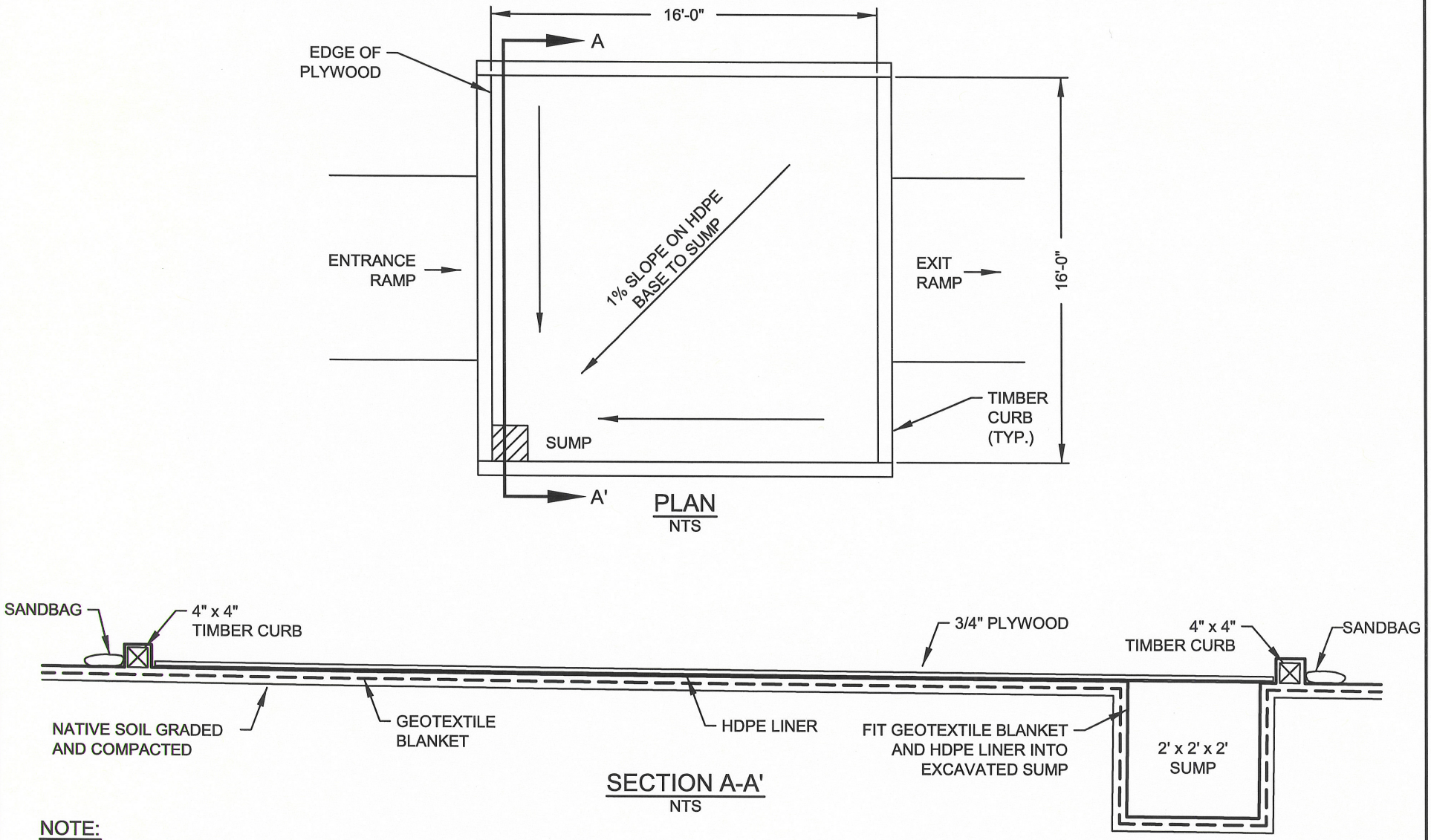



NOTE: SEE DRAWINGS CI-01 AND MP-01 FOR DETAILED LOCATIONS OF INJECTION AND MONITORING WELLS.

figure F.2.2

CONCEPTUAL LAYOUT OF BIOSPARGE SYSTEM
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco Site, Hicksville, New York*

06883-95(045)GN-WA012 MAR 11/2005

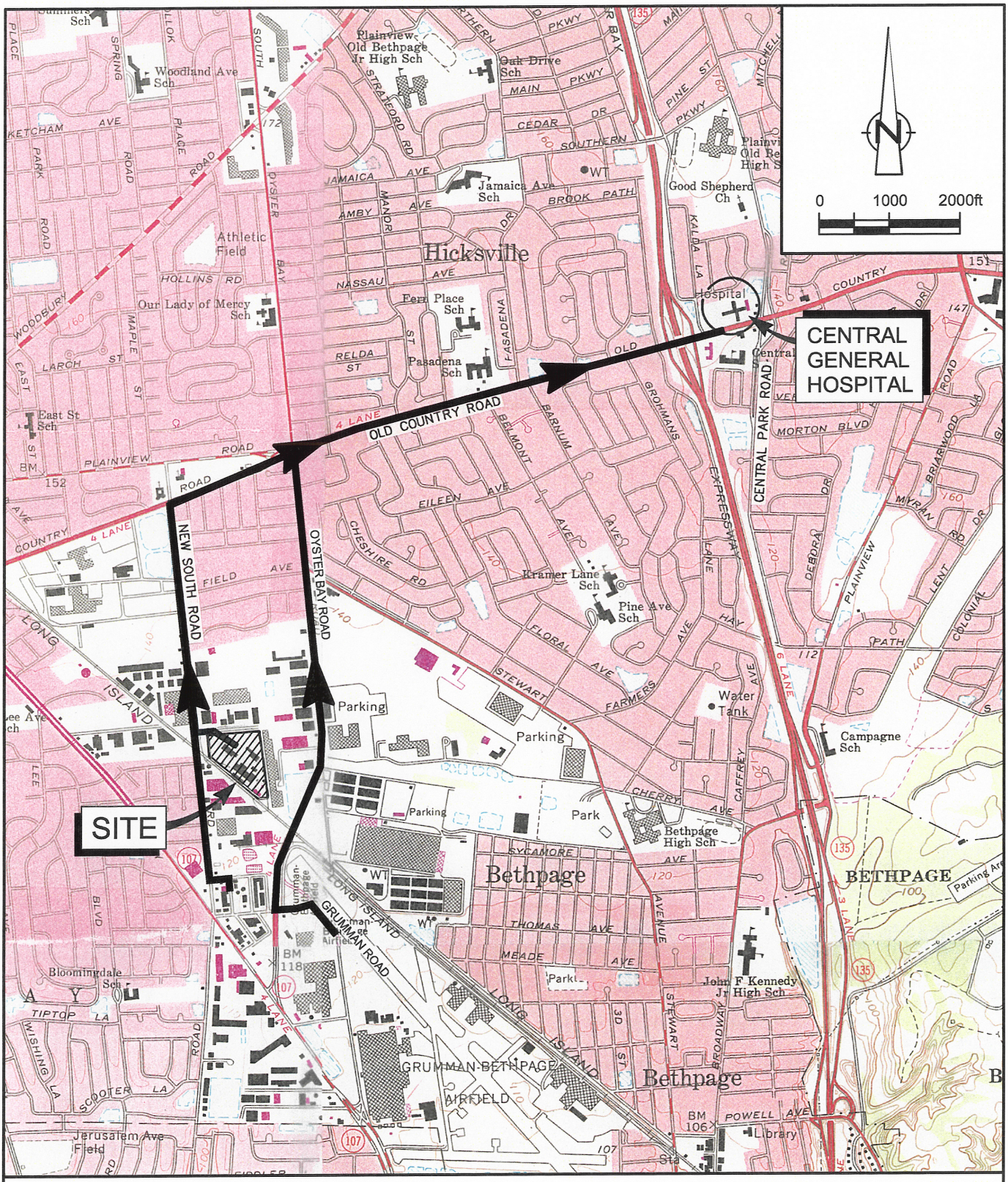



NOTE:

THE PAD SHOWN IS A TEMPORARY (I.E. SHORT TERM) MEDIUM DUTY USE DESIGN.

figure F.10.1

TYPICAL DECONTAMINATION AREA - MEDIUM DUTY
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco Site, Hicksville, New York*




SOURCE: USGS QUADRANGLE MAPS;
AMITYVILLE, FREEPORT, HICKSVILLE AND HUNTINGDON, NY

NOTE:
SEE FIGURE F.14.2 FOR DIRECTIONS

figure F.14.1

EMERGENCY HOSPITAL ROUTE
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco, Hicksville, New York*

06883-95(045)GN-WA014 MAR 11/2005

DIRECTIONS TO CENTRAL GENERAL HOSPITAL FROM BAYER FACILITY

- LEAVE SITE TURNING RIGHT ONTO NEW SOUTH ROAD
  GO APPROXIMATELY 1/2 MILE TO OLD COUNTRY ROAD.
- TURN RIGHT ONTO OLD COUNTRY ROAD, GO APPROXIMATELY
  1 AND 1/2 MILES TO CENTRAL GENERAL HOSPITAL.
- THE HOSPITAL WILL BE ON THE LEFT, JUST PAST THE EXPRESSWAY.

DIRECTIONS TO CENTRAL GENERAL HOSPITAL FROM BLUE FLAME ENERGY

- LEAVE SITE TURNING RIGHT ONTO WASHINGTON PARKWAY
  GO APPROXIMATELY 200 FEET TO MULBERRY STREET.
- TURN LEFT TO MULBERRY ROAD, GO APPROXIMATELY
  500 FEET TO NEW SOUTH ROAD.
- TURN RIGHT ONTO NEW SOUTH ROAD. GO APPROXIMATELY
  ONE MILE TO OLD COUNTRY ROAD.
- FOLLOW ABOVE INSTRUCTIONS FOR BAYER FACILITY.

DIRECTIONS TO CENTRAL GENERAL HOSPITAL FROM LILY POPCORN FACILITY

- LEAVE SITE TURNING RIGHT ONTO GRUMMAN ROAD
  GO APPROXIMATELY 500 FEET TO OYSTER BAY ROAD.
- TURN RIGHT ONTO OYSTER BAY ROAD, GO APPROXIMATELY
  1 AND 1/4 MILES TO OLD COUNTRY ROAD.
- TURN RIGHT ONTO OLD COUNTRY ROAD. GO APPROXIMATELY
  ONE AND 1/4 MILES TO CENTRAL GENERAL HOSPITAL.

DIRECTIONS TO CENTRAL GENERAL HOSPITAL FROM NORTHROP FACILITY

- LEAVE SITE TURNING RIGHT ONTO GRUMMAN ROAD
  GO APPROXIMATELY 1,000 FEET TO OYSTER BAY ROAD.
- FOLLOW ABOVE INSTRUCTIONS FOR LILY POPCORN FACILITY.

NOTE:
SEE FIGURE F.14.1 FOR A MAP

figure F.14.2

DIRECTIONS TO EMERGENCY HOSPITAL
OU-3 FINAL (100%) DESIGN REPORT
*Hooker/Ruco, Hicksville, New York*

# TABLES

## TABLE F3.1

## CHEMICAL COMPOUNDS PREVIOUSLY DETECTED AT THE SITE AND THEIR MAXIMUM DETECTED CONCENTRATION IN SITE SEDIMENTS AND SOIL
## HOOKER/RUCO SITE
## HICKSVILLE, NEW YORK

| *Chemical Compound* | *Maximum Concentration* [1] *(mg/kg)* |
|---|---|
| Trichloroethylene (TCE) | 1200 |
| Perchloroethylene (PCE) | 57 |
| Ethylbenzene | 1.3 |
| Toluene | 1.8 |
| Xylene | 1.1 |
| Phenol | 120 |
| 1,2-Dichloroethene (1,2-DCE) | 3.4 |
| Chloroform | 0.024 |
| Chlorobenzene | 0.41 |
| Styrene | 0.13 |
| 1,1-Dichloroethene (1,1-DCE) | 0.015 |
| Chloroethylenes | See PCE, TCE, and DCEs |
| Di-n-octyl phthalate | 21 |
| Di-n-butyl phthalate | 240 |
| Bis(2-ethylhexyl)phthalate | 88 |
| Fluoranthene | 2.4 |
| Pyrene | 1.8 |
| Chrysene | 1.4 |
| Phenanthrene | 1.3 |
| Benzoic Acid | 7.1 |
| Hexachlorocyclohexane | 0.53 |
| 4-Methylphenol | 0.24 |
| Dibenzofuran | 0.25 |
| Naphthalene | 0.27 |
| 2-Methylnaphthalene | 0.39 |
| Carbon Tetrachloride | 0.68 |
| Freon 113 | 50 ppb in water |

Notes:
mg/kg Milligrams per Kilogram
(1) Within the last 12 years

**TABLE F3.2**

**EXPOSURE ROUTES AND EXPOSURE LEVELS FOR THE IDENTIFIED CHEMICALS AT HOOKER/RUCO SITE HICKSVILLE, NEW YORK**

| *Chemical Compound (CAS #)* | *Ionization Potential* | *Odor Threshold (ppm)* | *Exposure Routes* | *Flash Point (°F)* | *Acceptable Exposure Levels in Air* |
|---|---|---|---|---|---|
| Trichloroethene (79-01-6) | 9.45 | 82 | Inhalation, Ingestion | NAP | 50 ppm (1)<br>1,000 ppm (2) |
| Perchloroethylene (127-18-4) | 9.32 | 47 | Inhalation, Ingestion<br>Animal Carcinogen | NAP | 25 ppm (1)<br>500 ppm (2) |
| Ethylbenzene (100-41-4) | 8.76 | 0.09 - 0.6 | Inhalation, Ingestion | 55 | 100 ppm (1)<br>2,000 ppm (2) |
| Toluene (108-88-3) | 8.82 | 1.6 | Inhalation, Ingestion<br>Skin Absorption | 40 | 50 ppm (1)<br>2,000 ppm (2) |
| Xylene (1330-20-7) | 8.5 | 0.62 - 20 | Inhalation, Ingestion | 85 | 100 ppm (1)<br>900 ppm (2) |
| Phenol (108-95-2) | 8.69 | 0.06 | Inhalation, Ingestion<br>Skin Absorption | 175 | 5 ppm (1)<br>250 ppm (2) |
| 1,2-Dichloroethene (540-59-0) | 9.8 | 0.085 - 17 | Inhalation, Ingestion | 37 | 200 ppm (1)<br>1,000 ppm (2) |
| Chloroform (67-66-3) | 11.37 | 132 - 276 | Inhalation, Ingestion<br>Possible Human Carcinogen | NAP | 10 ppm (1)<br>500 ppm (2) |
| Chlorobenzene (108-90-7) | 9.1 | 1.3 | Inhalation, Ingestion | 82 | 10 ppm (1)<br>1,000 ppm (2) |
| Styrene (100-42-5) | 8.47 | 0.15 | Inhalation, Ingestion<br>Skin Absorption | 88 | 20 ppm (1)<br>700 ppm (2) |
| 1,1-Dichloroethene (75-35-4) | 10 | 190 | Inhalation, Ingestion | -2 | 5 ppm (1) |
| Chloroethylene (75-01-4) | 9.99 | 10 - 20 | Inhalation, Ingestion<br>Human Carcinogen | NAP | 1 ppm (1) |
| Di-n-octyl phthalate (117-84-0) | NAV | NI | Inhalation, Ingestion | 420 | 5 $mg/m^3$ (3) |
| Di-n-butyl phthalate (84-74-2) | NAV | NI | Inhalation, Ingestion | 315 | 5 $mg/m^3$ (1)<br>4,000 $mg/m^3$ (2) |
| Bis(2-ethylhexyl phthalate) (117-81-7) | NI | NI | Inhalation, Ingestion | NAV | NI |
| Fluoranthene (206-44-0) | NAV | NAV | Inhalation, Ingestion | NAV | NAV |
| Pyrene (129-00-0) | NI | NI | Inhalation, Ingestion | NI | NI |
| Chrysene (218-01-9) | 7.75 | | Inhalation, Ingestion<br>Human Carcingen | NI | 0.2 $mg/m^3$ (1) |
| Phenanthrene (85-01-8) | NI | NI | Inhalation, Ingestion | 340 | NI |

**TABLE F3.2**

**EXPOSURE ROUTES AND EXPOSURE LEVELS FOR THE IDENTIFIED CHEMICALS AT HOOKER/RUCO SITE HICKSVILLE, NEW YORK**

| *Chemical Compound (CAS #)* | *Ionization Potential* | *Odor Threshold (ppm)* | *Exposure Routes* | *Flash Point (°F)* | *Acceptable Exposure Levels in Air* |
|---|---|---|---|---|---|
| Benzoic Acid (65-85-0) | NI | NI | Inhalation, Ingestion | NI | NI |
| Hexachlorocyclohexane (319-84-6) | NI | NI | Inhalation, Ingestion | NI | NI |
| 4-Methylphenol (106-44-5) | NI | NI | Inhalation, Ingestion | 187 | 10 $mg/m^3$ (3) NIOSH |
| Dibenzofuran (132-64-9) | NI | NI | Inhalation, Ingestion | NI | NI |
| Naphthalene (91-20-3) | 8.12 | 38 ppb | Inhalation, Ingestion | 174 | 10 ppm (1)<br>250 ppm (2) |
| 2-Methylnaphthalene (91-57-6) | NI | NI | Inhalation, Ingestion | NI | NI |
| Carbon Tetrachloride (56-23-5) | 11.47 | 140 | Inhalation, Ingestion<br>Skin Absorption, Animal Carcinogen | NAP | 5 ppm (1)<br>200 ppm (2) |
| Ethylene Glycol | NAV | 0.1 - 40 | Inhalation, Ingestion | 232° | 39.4 ppm (1) |
| Diethylene Glycol | NAV | NAV | Inhalation, Ingestion | NI | NI |
| Triethylene Glycol | NAV | NAV | Inhalation, Ingestion | NI | NI |
| 2,2-Dimethyl-1,3-Propane Diol | NAV | NAV | Inhalation, Ingestion | NI | NI |
| 2,6-Dimethyl-4-Heptanol | NAV | NAV | Inhalation, Ingestion | NI | NI |
| 2,2,4-Trimethyl-1,3-Pentanediol | NAV | NAV | Inhalation, Ingestion | NI | NI |
| 2-Ethylhexanoic Acid | NAV | NAV | Inhalation, Ingestion | NI | NI |
| Octanoic Acid | NAV | NAV | Inhalation, Ingestion | NI | NI |
| Hexanoic Acid | NAV | NAV | Inhalation, Ingestion | NI | NI |
| Freon 113 | 11.99 | NAV | Inhalation, skin/eye contact, Ingestion | NI | 760 $mg/M^3$ (NIOSH) |

Notes:

(1) - 2004 Values, American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).
(2) - Immediately Dangerous to Life and Health.
(3) - TWA Exposure limit from other jurisdiction.
$mg/mg^3$ - Milligram per cubic meter.
ppm - Parts Per Million.
NI - No Information
NAP - Not Applicable
RD - Respirable Dust
TD - Total Dust
NAV - Not Available
NIOSH - National Institute of Occupational Safety and Health

## TABLE F3.3

## TENTATIVELY IDENTIFIED COMPOUNDS (TICs) [1]
## HOOKER/RUCO SITE
## HICKSVILLE, NEW YORK

Ethylene Glycol
Diethylene Glycol
Triethylene Glycol
Dipropylene Glycol
2,2-Dimethyl-1,3-Propane Diol
2,6-Dimethyl-4-Heptanol
2,2,4-Trimethyl-1,3-Pentanediol
2-Ethylhexanoic Acid
Octanoic Acid
Hexanoic Acid

Notes:
TICs represent materials or incomplete products associated with the manufacturing process at the Site.

(1) Pursuant to Section 4.2.4.14 of the "Draft Remedial Investigation Report" dated April 1990 (Revised August 1992), the TICs were not "individually identified". The maximum sum of historic concentrations in soil was 6,310 mg/kg.

**TABLE F7.1**

**SPECIFIC PERSONAL PROTECTION LEVELS**
**HOOKER/RUCO SITE**
**HICKSVILLE, NEW YORK**

| *Work Task* | *Maximum Protection Level (1)* | *Alternate Protection Level (2)* |
|---|---|---|
| Mobilization and Demobilization of Labor, Materials and Equipment to and from the Site | Modified D | D |
| Drilling Activities | | |
| - >200 feet deep | Level C | Modified D |
| - <200 feet deep | Modified D | D |
| Installation of Groundwater and Treatment System Injection/Monitoring Wells | | |
| - >200 feet deep | Level C | Modified D |
| - <200 feet deep | Modified D | D |
| Construction of the Treatment Control Building | D | D |
| Construction of the Injection System | D | D |
| Treatment System Operation and Maintenance Activities | Level C | Modified D/D |
| Groundwater Monitoring Activities | Level C | Modified D |
| Decontamination Activities | Level C | Modified D |
| Working Around High Pressure Compressed Air | Modified D | D |

Notes:
Specific requirements of protection levels are detailed in Section F6.1.

(1) Level C: To be worn when the criterion for using air-purifying respirators (APRs) are met and a lesser level of skin protection is needed.
Modified Level D: To be worn when dermal protection is required, however, no respiratory hazards are present. It provides minimal protection against chemical hazards.

(2) Alternate protection levels will be used if monitoring indicates that conditions are appropriate or the HSO and CIH agree that there is a reduced potential of exposure.

**TABLE F8.1**

**ANTICIPATED HAZARDS/RISKS AND APPROPRIATE PRECAUTIONS**
**HOOKER/RUCO SITE**
**HICKSVILLE, NEW YORK**

| *Activity* | *Anticipated Hazards/Risks* | *Appropriate Precautions* |
|---|---|---|
| 1. Mobilization and Demobilization Activities, Construction of the Treatment Control Building, Construction of the Injection System, Installation of Shallow Wells | • slip/trip/fall hazards<br>• potential back injuries from lifting heavy objects<br>• potential heat or cold stress<br>• severe weather<br>• electrical hazards from power sources<br>• moving or backing vehicles<br>• hazards presented by the use of drilling and excavation equipment<br>• overhead hazards (e.g., electrical lines) and underground utilities<br>• potential burns from hot equipment<br>• potential confined space entry<br>• excavation hazards such as cave-ins<br>• exposure to vehicular traffic on public highways<br>• pinch points<br>• working from aerial lifts, platforms, scaffolding, or on the leading edge of a reef | • Modified D or Level D personal protection<br>• practice safe lifting techniques<br>• participate in on-Site training programs<br>• practice good personal hygiene principles<br>• use a spotter around moving or backing equipment<br>• work activities will be reduced or suspended during severe weather conditions<br>• ground fault circuit interrupters (GFCIs) shall be used to reduce the hazard of electrical shock. Do not stand in water when handling equipment. Electrical equipment will be approved.<br>• keep first aid supplies readily available<br>• perform an underground utility location survey<br>• use a spotter around moving or backing equipment<br>• remove tripping hazards, rope off slippery areas to keep personnel out or remediate the condition<br>• maintain good housekeeping<br>• identify all high temperature objects or equipment<br>• work activities will be reduced or suspended during severe weather conditions<br>• implement an approved confined space entry program<br>• obtain all required permits for excavating across or tunneling under public highways<br>• establish proper vehicular traffic controls including control barriers and use of flagmen when excavating across highways<br>• wear reflective vests when exposed to vehicular traffic<br>• remove tripping hazards, rope off slippery areas to keep personnel out or remediate the condition<br>• maintain good housekeeping<br>• make sure that a fall protection program is in place<br>• follow OSHA's standard for steel erection |

**TABLE F8.1**

**ANTICIPATED HAZARDS/RISKS AND APPROPRIATE PRECAUTIONS**
**HOOKER/RUCO SITE**
**HICKSVILLE, NEW YORK**

| *Activity* | *Anticipated Hazards/Risks* | *Appropriate Precautions* |
|---|---|---|
| 2. Installation of Deep Wells, Treatment System Operation and Maintenance Activities, Groundwater Monitoring Activities and Decontamination Activities | • slip/trip/fall hazards<br>• potential back injuries from lifting heavy objects<br>• potential heat or cold stress<br>• severe weather<br>• electrical hazards from power sources<br>• moving or backing vehicles and equipment<br>• personnel injuries from sharp objects, falling debris or pinch points<br>• direct contact with potentially contaminated soils, groundwater and sediments.<br>• hazards presented by the use of drilling and excavating equipment<br>• overhead hazards (e.g., electrical lines) and underground utilities<br>• potential burns from hot equipment<br>• hazards presented by the use of specialized equipment (e.g., decontamination equipment)<br>• reduced field of vision from wearing full-face respirators<br>• exposure to vehicular traffic on public highways<br>• potential hazards for handling potassium permanganate | • Level C, or Modified Level D, based on actual field activities, specific work areas, and/or established protection levels (see Table F6.1)<br>• practice safe lifting techniques<br>• participate in all on-Site training programs<br>• be trained with all appropriate equipment standard operating procedures<br>• practice good personal hygiene principles<br>• take proper precautions in unsafe areas<br>• use the "Buddy System"<br>• only essential personnel allowed in work area<br>• perform an underground utility location survey<br>• use a spotter around moving or backing equipment<br>• remove tripping hazards, rope off slippery areas to keep personnel out or remediate the condition<br>• maintain good housekeeping<br>• identify all high temperature objects or equipment<br>• work activities will be reduced or suspended during severe weather conditions<br>• GFCIs shall be used to reduce the hazard of electrical shock. Do not stand in water when handling equipment. Electrical equipment will be approved.<br>• keep first aid supplies readily available<br>• wear reflective vests when exposed to vehicular traffic |
| 3. Working Around High Pressure Compressed Air | • skin puncture and injection injuries due contact with with pressure gas stream<br>• frostbite injuries<br>• injuries from disconnected hoses under pressure<br>• noise from the compressor | • Level C, or Modified Level D, based on actual field activities, specific work areas, and/or established protection levels (see Table F7.1)<br>• check connections for leaks<br>• avoid aiming gas jets at personnel<br>• wear protective clothing, gloves and safety glasses<br>• ensure good hose connections<br>• make sure air pressures are not exceeded per OSHA's standard |

# ATTACHMENT F.1

# CONTRACTOR REQUIREMENTS FOR NEIGHBORING PLANTS/FACILITIES

# Airborne Early Warning & Electronic Warfare Systems
# Bethpage, New York

## Contractor Environmental, Safety and Health Guide

## October 29, 2004

Table of Contents

## Introduction

Accident prevention at Northrop Grumman is considered to be of primary importance in all phases of operation and administration. As used in this guide, the term "contractors" means any entity, including subcontractors, suppliers, agents and representatives at the Northrop Grumman Bethpage, NY site to conduct work for or on behalf of Northrop Grumman Corporation. Contractors shall maintain a safe work environment for employees, visitors and contractors in accordance with all applicable health, safety and environmental laws, rules and regulations, including but not limited to those promulgated by the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA).

In addition, while on the Bethpage, NY site, the following rules shall apply and shall be adhered to by all contractors providing service to the company, excluding job-shop employees. It is not the intent of this guide to address all issues that might be encountered, but rather to provide an overview of environmental, safety and health issues and concerns. Noncompliance with this guide may result in suspension and /or termination of work in progress.

If there are any questions about this guide, please contact the Northrop Grumman Project Engineer/Manager. In this guide you will see references to the Environmental, Safety, Health and Medical Services department (ESH&M.) ESH&M is the Northrop Grumman department that is responsible for Environmental, Safety and Health compliance and programs for the Bethpage, NY site.

## Submittals:

### Material Safety Data Sheets (MSDS)

Contractors must submit to the Northrop Grumman Project Manager/Engineer a list of all chemicals they propose to bring or use on the Bethpage, NY site. The information provided should include proposed container, quantity, storage method and Material Safety Data Sheets (MSDS) for the chemicals. The list and MSDS will be reviewed by ESH&M prior to the chemicals being allowed on site. The contractor must also maintain these MSDSs on-site. Personnel working with hazardous chemicals must be trained by their employer on the proper and safe use of hazardous chemicals per the OSHA Hazard Communication standard and other rules or regulations.

### Site-Specific Health and Safety Plan

Prior to the start of a job, contractors must submit a site-specific health and safety plan. The plant will be reviewed by ESH&M for compliance with OSHA requirements and site procedures.

## General Environmental, Safety and Health Rules

Contractors must:

- Follow all Northrop Grumman safety instructions, procedures and rules outlined in this guide and Local, State and Federal laws, rules and regulatory requirements.
- Wear appropriate safety clothing and proper personal protective equipment at all times (e. g. safety shoes, eye and hearing protection, gloves, head protection, etc.) while working on site.
- Not smoke in any Northrop Grumman building or vehicle. All buildings have designated smoking areas outside of the buildings.
- Prior to beginning work, become familiar with posted evacuation routes and the nearest eyewash and/or safety shower.
- Immediately report any emergency (accidents, spills, etc.) to Security at 575-3333. DO NOT CALL 911.
- Leave construction areas clean at the end of the day.
- During the workday maintain a clear, fire-safe area.
- Put trash in designated trash containers, making sure to separate regular trash from hazardous (industrial) wastes (see section "Waste Disposal/Hazardous Waste/Scrap Metals" on page 9.)
- Prior to acceptance of project completion by Northrop Grumman, repair all damaged property, seal all holes, remove all non-hazardous waste and rubbish (construction debris, etc.) caused or generated by the job and return the job site to a safe condition.
- Remove all materials, tools, equipment, or other obstructions from aisles, exits, or roadways at the end of each workday.
- Not use equipment with red STOP tags and/or lockout/tagout locks and tags. These tags indicate that the equipment is unsafe or under repair and must not be used.
- Not make unauthorized repairs to Northrop Grumman equipment.
- Not remove or tamper with machine guards, interlocks or other safety devices. If they are not functioning properly, notify the Northrop Grumman Project Manager immediately.
- Read and obey all signs, labels, danger notices, and other warning devices; never remove them without proper authorization.

## Above-Ceiling Work

A main concern of above ceiling work is the safety of people working below. Work over occupied areas by contractors is limited to inspection, troubleshooting, and minor repairs, using handtools and/or parts and materials not weighing over a total of five pounds.

The hazards of above ceiling work include structural obstacles and protruding ducts, pipes, and conduits that may represent bump hazards. Contractors shall carefully move around these obstacles and shall not leave the catwalks or step on false ceilings. Remember to remove all trash and excess material before leaving.

The Project Manager must be informed by the contractor of breaches of any building system, such as piping, ducting or covers, that was not part of the project's scope of work.

In the event of a special situation where these overhead rules cannot be observed, the contractor, subcontractor or representative must ensure the following steps are taken prior to beginning work:

- Contact the Northrop Grumman Project Manager for approval prior to the task.
- Ensure the space below the work area is clear of all employees, and barricaded.
- Inform the Northrop Grumman Project Manager when the work will start and when the work has been completed.

## Asbestos Containing Material

Some buildings at Long Island sites contain asbestos. Contractors that are not remediating asbestos, but working in areas containing asbestos, shall be informed and briefed at the Pre-Construction meeting.

It is expected that asbestos containing materials will be identified prior to the start of the project. However, as a precaution, the contractor should be alert to materials that could contain asbestos. Some examples of more common asbestos containing materials are thermal insulation on piping, ducts, and equipment; floor tile; roofing; gasket material; electrical wire insulation; and Spackle for sheet rock and/or other surfacing materials.

If a suspect material has not been positively identified and the material will be or may be disturbed during the course of construction the contractor, subcontractor or representative must cease work immediately and notify the Northrop Grumman Project Engineer.

## Barricades

Contractors shall comply with all applicable laws, rules and regulations, including:

- Posting construction area warning signs at all construction sites.
- Posting warning signs and barricades for the temporary storage of materials or for all work done in the hallways.
- Barricading work that might expose personnel to unsafe conditions
- Being responsible for providing all barricade materials and signs and maintaining them in their work areas as they progress

- Being aware that occupied areas require special consideration and notify the Northrop Grumman Project Manager when the proposed work might disrupt the productivity of others, present a health and safety concern to Northrop Grumman employees, or may require employees to be relocated.
- Coordinating work in the main corridors with the Northrop Grumman Project Manager/Engineer.

## Confined Space Entry

Confined Spaces include but are not limited to areas such as excavated pits, manholes or tanks. Working in a confined space, requires that contractors have confined space entry training and other applicable training that meets OSHA requirements (e.g., lockout/tagout, respiratory protection, rescue procedures, hazard communication, hearing conservation, personal protective equipment, etc.). Prior to and during confined spaces entry the atmosphere shall be tested for oxygen concentration, flammability, toxicity, and any other safety and health hazards evaluated. The contractor shall provide all necessary equipment for confined space entry (e.g. personal protective equipment, ventilation ladders lighting, self rescue equipment) to his/her employees. NO EMPLOYEE SHALL BE ALLOWED TO WORK ALONE.

Any area can suddenly become a "confined space" given certain conditions. Contractors shall obtain available information regarding known hazards and entry operations from the ESH&M representative. The contractor, subcontractor, or representative will be apprised of precautions or procedures that Northrop Grumman has implemented for the protection of employees in or near the confined space. The EHS&M representative and the Project Engineer/Manager shall be immediately informed of any hazards confronted or created in a confined space.

No one may enter a permit required confined space without a confined space entry permit. The contractor must provide his/her own permits and provide copies to the Northrop Grumman Health and Safety Department. The contractor must provide proper training and equipment for their employees. All workers who enter confined spaces must have proof of training in accordance with OSHA regulations located at 29CFR 1910.146.

Training certificates, a confined space entry plan and program, and a list of instrumentation, personal protective equipment and other equipment that may be utilized must be provided to ESH&M prior to the beginning of the job.

All confined space work requires compliance with various permit or other requirements, including those pertaining to entry supervisor, attendant, entrant, training, support/rescue equipment, etc.

## Construction Debris

Contractors, subcontractors, and representatives must keep the construction site clean and free of obvious hazards, such as boards with protruding nails, oil or solvent spills, and combustible waste. Unless directed otherwise, the contractor, subcontractor and representatives are responsible for the removal of all construction debris. Contractors, subcontractors, and representatives shall supply dumpsters, gondolas, or any other container required to remove waste items from the site unless an authorized dumpster has been arranged by the Project Manager.

## Contractor Supervision

The contractor shall have a superintendent or designee to provide full time supervision on the job site. The superintendent shall represent the contractor and all communications with the superintendent shall be as if given to the contractor.

## Electrical Work

Prior to conducting any electrical work, see the Lock-out/Tag-out section of this guide.

Work on live electrical circuits is prohibited, unless shutting off the power will introduce additional hazards. Only qualified contractor personnel who have been trained to use "energized work safe practices" are allowed to work on live equipment or circuits and only with the prior notification of the Northrop Grumman Project Manager.

Breakers or switches used to de-energize a circuit must be locked out in the **OFF** position. Test the circuit to verify that it is off, and post the box with an authorized individual's lock and a **DANGER** tag.

The lockout procedure also applies to repair work on any machinery or process that could cause injury from an unexpected start-up or release of energy.

Don't depend on the circuitry or panel identification to tell you that a circuit has been shut off. Assume all wiring is "live" until you have personally tested it.

Erect barriers and warning signs where employees could be exposed to open electrical boxes or live conductors.

GFCI(s) shall be used whenever working in a wet and or conductive locations.

## Emergency/First Aid

Contractors, subcontractors and representatives must: Report all emergencies, including injuries, to Northrop Grumman Security immediately at 575-3333. Be prepared to provide information on the location and the nature of the emergency. Unless it is impossible or unsafe, stay on the phone until instructed to hang up. DO NOT CALL 911.

## Equipment and Tools

Contractors, subcontractors and representatives are required to furnish their employees with tools and equipment that are in good condition and meet applicable safety standards. Northrop Grumman tools and equipment (including ladders) are not to be used by contractors, subcontractors or representatives.

Contractors, subcontractors, and representatives must:

- Use electric tools that are double insulated or grounded with three-wire plugs.
- Use Ground Fault Circuit Interrupters (GFCI) with any electrically operated tools or

equipment in wet locations.
- Comply with the latest National Electrical Code and OSHA requirements for use of tools on site.

## Excavation Requirements

Contractors are responsible for ensuring that all utilities have been marked out prior to excavation. Contractors are also responsible for providing for all proper trenching and shoring required for the project; projects found to have inadequate trenching or shoring will be immediately suspended.

Any excavated material requiring off site disposal must be coordinated with and approved by the ESH&M (575-4680) prior to removal from the site.

## Fall Protection Requirements

Contractors conducting work that requires fall protection per OSHA requirements shall use a safety harness system or safety belts. Northrop Grumman recommends the use of safety harnesses.

## Fire Prevention

All chemicals must be stored in appropriate containers that are labeled with the contents and potential hazards. Containers of flammable chemicals must be in storage cabinets approved for flammable chemicals. Also - see the section of this guide pertaining to Material Safety Data Sheet submission.

Tar pots used by roofing contractors must be attended while they are in use, and the attendant must be equipped with a carbon dioxide or dry-chemical fire extinguisher and trained in its proper use.

Contractors shall not use fire hydrants for a water supply; and shall arrange for the use of domestic water taps with the Northrop Grumman Project Manager.

Smoking is not permitted inside any Northrop Grumman building or vehicle. Outside smoking is also not permitted where flammable liquids or gases are used or stored or where posted regulations prohibit smoking.

All fires, whether ongoing or extinguished, must be reported immediately to Security by calling emergency extension 5-3333. DO NOT CALL 911. Immediately leave the area of a fire.

## Halon Systems

Contractors, subcontractors and representatives shall work carefully within areas that contain Halon fire suppression systems, since these systems have multiple sensors and can be inadvertently set off. Any Halon System shutdown or modification requires security be notified prior to initiation. Contractors, subcontractors and representatives shall check with the Northrop Grumman Project Manager before working in any identified Halon system area.

## Hot Work (Welding & Cutting)

Contractors shall obtain a Hot Work Permit from the Northrop Grumman Security Department before performing any welding, cutting, brazing, soldering work, or work that may produce sparks.

The permit is valid for only one day and for use in the area specified on the permit. The permit must be renewed daily unless conditions change then work should cease and the permit be reissued. A security department representative will accompany the welder to the job site and assess hot work related site hazards.

The Hot Work Permit requires the contractor, subcontractor or representative to maintain a fire watch for the duration of the hot work tasks and for 30 minutes after the work is completed. The person performing the fire watch must be equipped with a fire extinguisher rated for the type of hazard at the work site, and trained in its proper operation, and aware of the location of the nearest fire alarm. If a fire does start, the fire watch must immediately call emergency extension 5-3333 and leave the area. The contractor, subcontractor, or representative employees may attempt to extinguish the fire with the appropriate fire extinguisher providing there is no chance of injury, and they are trained and capable of operating the extinguisher safely and effectively.

In addition, contractors, subcontractors, or representatives shall observe the following welding safety rules:

- Wear proper eye protection and protective clothing (welders and helpers).
- Keep gas cylinders securely chained in an upright position.
- Shield employees from arc rays and sparks.
- Do not cut or weld in areas where vapors are present from flammable liquids and gases, or vapor degreasers.
- Use non-flammable welding tarps to cover machinery and furnishings in the welding area so that sparks and hot metal do not fall on them.

## Industrial Waste & Hazardous Waste Collection/ Scrap Metal

Washrooms shall not be used for any type of contractor, subcontractor, or representative cleanup. Chemicals may not be discarded into sinks, drains, dumpsters, or on the ground.

Prior to the generation of any industrial wastes (including hazardous wastes), the contractor, subcontractor, or representative must notify the Northrop Grumman Project Engineer/ Manager.

Industrial or hazardous wastes (e.g., solvents, paints, etc.) can only be accumulated in containers approved by the Environmental, Safety, Health and Medical Services (ESH&M) department and stored in areas approved by ESH&M. All drums of industrial waste must be marked with a description of the container's contents and have the appropriate labels in place (i.e., Hazardous Waste, Non-regulated, etc.). ESH&M will give direction to the contractor, subcontractor or representative regarding proper marking, labeling and dating of drums and containers.

Contractors, subcontractors and representatives shall keep all containers of industrial waste

closed unless adding waste. They shall also ensure that all containers used for industrial waste collection are in good condition, i.e., free of leaks or major denting.

Contractors, subcontractors, and representatives shall arrange with the Northrop Grumman Project Engineer/Manager for the delivery of empty waste collection containers and the removal of full waste containers. Contractors, subcontractors, and representatives shall not remove any industrial/hazardous waste from the Northrop Grumman Bethpage work-site.

The contractor must check with the project manager for requirements concerning the removal and/or disposal of scrap metal or equipment, prior to the start of the project.

Spills of wastes or other chemicals must be reported immediately to Security at 575-3333.

## Inspections

The Northrop Grumman Environmental, Safety Health and Medical Services (ESH&M) and/or an ESH&M designated representative may inspect a job site to ensure compliance with contract terms and this guide. Northrop Grumman reserves the right to require contractors to stop work in situations that may pose imminent harm to the health or safety of employees, visitors or the environment.

## Insurance

The contractor shall procure and maintain liability insurance as detailed in the contract specifications.

## Lockout/Tagout

All contractors are responsible for training and informing their employees in proper lockout/tagout procedures that include the prohibition against tampering with energy isolation devices.

When installing new equipment, each contractor, subcontractor, or representative will be required to provide all necessary information for lockout of all energy sources for the particular piece of equipment. This information should be presented, in a legible format, to the Northrop Grumman Project Manager two workdays prior to final hook-up.

Contractors shall adhere to OSHA's lockout/tagout standard (29 CFR 1910.147), and honor Northrop Grumman's Long Island sites lockout/tagout requirements. Group lockout is prohibited.

Contractors, subcontractors, and representatives shall lockout and tagout all sources of energy when working on them, including but not limited to, electrical circuits and draining lines of chemicals or gases. Movable devices, such as rams on machines, must be rendered immovable. The use of tape or tags without locks and other non-secure lockout equipment is strictly prohibited on all Long Island sites.

## Parking/ Vehicle Operations

Contractors, subcontractors, and representatives must:

- Park only in areas designated by the Northrop Grumman Project Manager.

- Not park in reserved or restricted areas. Trucks and equipment must be parked to allow emergency vehicles to get through and to allow access to fire hydrants and other emergency equipment.

- Observe speed limits and traffic signs.

- Secure loads to prevent accidents.

**Personal Protective Equipment**

Appropriate protective equipment, such as hard hats and hearing, eye, face, hand, body, or respiratory protection, must be worn when the job requires them or when required by signs posted in the work area. Contractors, subcontractors and representatives are responsible for providing their employees with the appropriate protective equipment in good condition that is in conformance with OSHA standards. Contractors, subcontractors, and representatives are also responsible for making sure that their employees or subcontractors are trained in the use of such equipment. Contractors not following these requirements may not be allowed to work on Northrop Grumman property.

**Radiation Safety**

Areas marked with radiation hazard signs are controlled to ensure health and safety and may only be entered by authorized personnel. Health and safety rules posted for any such area should be strictly followed. If you have any questions regarding these safety rules, any other precautions, or the degree of hazard, ask the Project Engineer/Manager, who will contact EHSMS.

**Roof Safety**

Roof work at Northrop Grumman sites has security requirements and safety hazards. Therefore, contact the Project Manager prior to all work on the roof.

Notify the Project Manager immediately if the roofing system is damaged during the conduct of contracted work.

**Salvageable Materials**

All salvageable materials shall be turned over to Northrop Grumman unless specified in the contract.

**Sanitation Requirements**

Contractors shall arrange, before beginning a project, with the Project Engineer/Manager to ensure that adequate and appropriate sanitation facilities for the project are available. The contractor should not assume that the Northrop Grumman Corporation Bethpage site will provide sanitation facilities or that the contractors', subcontractors' or representatives' employees will have the use of Northrop Grumman sanitation facilities.

## Security

All personnel must establish identity, citizenship, or legal presence in the U.S.. Security will issue badges daily to each individual that must be returned to the Security department at the end of each day on departing the site.

Contractors, subcontractors and representatives shall be responsible for the security of their equipment.

## Telephone

The contractor shall be responsible for providing his own telephone services.

All contractor personnel, including subcontractors and representatives shall not utilize Northrop Grumman telephones and shall remain in their work area.

# ATTACHMENT F.2

# TRAINING ACKNOWLEDGMENT FORM

## HASP PLAN ACKNOWLEDGMENT SHEET

This is to certify that I have received a pre-entry briefing regarding this HASP (Occidental Chemical Corporation-Hooker Ruco Site, Hicksville, New York) and I understand its contents. My failure to follow and comply with the requirements contained in this plan may result in disciplinary action, removal from the site, and/or termination.

| *Print Name* | *Signature* | *Date* |
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# ATTACHMENT F.3

# DAILY SAFETY MEETING LOG

## SAFETY MEETING FORM

## OCCIDENTAL CHEMICAL CORPORATION-HOOKER RUCO SITE,

## HICKSVILLE, NEW YORK

Date:_____Time:_____

Site Location:_____

**Site Personnel in attendance:**

| *Name (Print)* | *Signature* | *Company* |
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**Safety Topics/Items discussed:**

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_____

**Site Safety Officer**

Name: _____ Date: _____

# ATTACHMENT F.4

# SOP FOR ELECTRICAL SAFETY AND LOCK OUT TAG OUT

# LIST OF ATTACHMENTS

ATTACHMENT F.4 STANDARD OPERATING PROCEDURES
- ELECTRICAL SAFETY
- THE CONTROL OF HAZARDOUS ENERGY

# TABLE OF CONTENTS

Page

ELECTRICAL SAFETY

# ELECTRICAL SAFETY

## 1.0 INTRODUCTION

The objective of the Electrical Safety Standard Operating Procedure (SOP) is to provide electrical safety guidelines, procedures, and inspections for the purpose of ensuring the safety of all Site personnel. Additionally, adherence to this SOP ensures compliance with the Occupational Safety and Health Administration (OSHA) requirements.

## 2.0 SCOPE

The scope of this SOP applies to all Conestoga-Rovers & Associates (CRA) personnel and subcontractors involved with field or construction activities utilizing electrical power. Electrical inspections are to occur during initial Site setup and monthly thereafter. These inspections are to be documented via either the Superintendent's logbook, the Site Health and Safety Officer's (HSO) logbook, or on the attached forms. The frequency of the inspections are to occur initially and then on a monthly basis thereafter. These forms can provide guidance for conducting the inspection as well as documenting them.

## 3.0 RESPONSIBILITIES

### 3.1 SUPERINTENDENTS/EQUIPMENT MANAGERS

It is the responsibility of the Site Superintendent (SS) and/or the Equipment Manager (EM) to assign a "competent person" to inspect and test electrical equipment. Additionally, the SS and or EM are to ensure that the Assured Equipment Grounding Conductor Program (See Section 4.0) is implemented on Site.

### 3.2 COMPETENT PERSON

The competent person has the responsibility to inspect and test on-Site electrical equipment and tools, including faulty insulation, improper grounding, loose electrical connections, and defective parts. The competent person will conduct testing and inspections upon initial project setup and monthly thereafter.

### 3.3 EMPLOYEES

Employees and subcontractors have the responsibility to follow the Project Safety Program and the constituents of this SOP. This includes the daily visual inspection of cord sets, electrical tools, or other pieces of electrical equipment before use.

## 4.0 ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM

### 4.1 GENERAL

As per OSHA, correct ground-fault protection requires the use of either Ground Fault Circuit Interrupters (GFCIs), which are devices that prevent electrical shock or an Assured Equipment Grounding Conductor Program. An Assured Equipment Grounding Conductor Program is a program that covers the inspection, repair and/or maintenance of cords and receptacles that are not part of the permanent wiring of a building, and equipment connected by cord and plug not protected by a GFCI.

### 4.2 APPROVED TESTING PROCEDURES

These following testing procedures are required by law before first use, after any repairs, after any suspected damage may have occurred, and at quarterly intervals. Any equipment in need of repair shall be taken out of service until repairs have been made.

#### 4.2.1 TESTING FOR CONTINUITY

The continuity test is used to assure that the equipment grounding conductor is electrically continuous. It must be performed on all cords and receptacles that are not part of the permanent wiring. This testing can be accomplished with a continuity tester.

#### 4.2.2 VISUAL TESTING

Receptacles and attachment caps or plugs are visually inspected to ensure that the equipment grounding is attached to its proper terminal.

## 4.3 INSPECTION DOCUMENTATION PROCEDURES

The required equipment inspections, tests, and testing date will be recorded, and the record is to be kept in the on-Site project file or in the Site Superintendent's or HSO's logbook. Electrical equipment used on Site will be inspected for damage or defects before each days use, and any equipment that is found to be defective will be taken out of service immediately.

## INITIAL SAFETY INSPECTION CHECKLIST FOR ELECTRICAL INSPECTION REFERENCED BY OSHA STANDARDS AND STANDARD OPERATING PROCEDURES

(This checklist is to be completed at job startup)

Job Location: _____ Project No.: _____

Inspected By: _____ Date: _____

Signature: _____

| | *Subject* | *OSHA Standard* | *NA* | *Yes* | *No* | *Date Inspected* |
|---|---|---|---|---|---|---|
| 1. | Has a competent person been assigned to inspect and test electrical equipment? | 1926.404(b)(1)(iii)(B) | | | | |
| 2. | Has equipment been inspected to ensure there are no hazards which would cause death or physical harm? | 1926.403(b)(1) | | | | |
| 3. | Is all electrical equipment marked with the manufacturers' name, trademark, another descriptive marking, and are voltage, current, wattage, and other necessary ratings present? | 1926.403(g) | | | | |
| 4. | Will work be performed within 20 feet of energized overhead powerlines? If yes, see Item 6. | | | | | |
| 5. | Is all equipment and conductors approved (i.e., UL approved)? | 1926.403(a) | | | | |
| 6. | If work is to be performed around powerlines, are the lines de-energized and grounded and a lockout/tagout program instituted? | 1926.416(a)<br>1926.416(g)(2) | | | | |
| 7. | Are live parts of electric equipment operating at 50 volts or more guarded? | 1926.403(i)(2)(i) | | | | |
| 8. | Are ground fault circuit interrupters (GFCI) readily available? | 1926.404(b)(1) | | | | |
| 9. | Do all extension cords have functional ground conductors? | 1926.405(i)(1) | | | | |
| 10. | Does all equipment intended to break current have an interrupting rating sufficient to break the current? | 1926.403(c) | | | | |
| 11. | Is all electric equipment firmly secured to the surface which it is | 1926.403(d)(1) | | | | |

| | Subject | OSHA Standard | NA | Yes | No | Date Inspected |
|---|---|---|---|---|---|---|
| | mounted? | | | | | |
| 12. | Are parts of electric equipment which in ordinary operation produce arcs, sparks, or flames isolated from all combustible materials? | 1926.403(f) | | | | |
| 13. | Are all disconnecting means (i.e., switches, circuit breakers, etc.) marked to indicate its purpose? | 1926.403(h) | | | | |
| 14. | Are all conductors used in grounding equipment identifiable and distinguishable from all other conductors? | 1926.404(a)(1) | | | | |
| 15. | Are systems, circuits, and equipment properly grounded. | 1926.404(f) | | | | |
| 16. | Are working spaces and walkways kept clean of cords so as not to create a hazard to employees? | 1926.416(b)(2) | | | | |
| 17. | Is a written copy of lockout/tagout procedures on-Site? | 1926.417(a)(1) | | | | |
| 18. | Are all pull boxes, junction boxes, and fittings provided with covers? | 1926.405(b)(2) | | | | |
| 19. | Are flexible cords and cables located in areas suitable for their use? | 1926.405(g) | | | | |
| 20. | Are splices or joints capped or insulated? | 1926.403(e) | | | | |
| 21. | Are all circuit boxes and control boards clearly labeled indicating their purpose? | 1926.403(h) | | | | |
| 22. | Is the work area around control panels and circuit boxes clear and easily accessible? | 1926.403(i)(1) | | | | |
| 23. | Is a record of inspection on equipment part of the assured equipment grounding conductor program? Documentation attesting that each receptacle, cordset, and cord and plug connected equipment have passed inspection is to be maintained. | 1926.404(b)(iii)(G) | | | | |
| 24. | Have all cord sets been inspected and tested? Have worn or frayed cords been removed from work area? | 1926.416(e)(1)<br>1926.404(b)(1)(iii)(C)<br>1926.404(c)(d)(e) | | | | |
| 25. | Has an individual been appointed to keep the inspections current? | 1926.404(b)(1)(iii) | | | | |

| | Subject | OSHA Standard | NA | Yes | No | Date Inspected |
|---|---|---|---|---|---|---|
| 26. | If open conductors (non-insulated wire) are used, do they meet clearance requirements? | 1926.404(c)(1)(ii-iv) | | | | |
| 27. | Is lighting protected from accidental contact or breakage? | 1926.405(a)(2)(ii)(E) | | | | |

## MONTHLY ELECTRICAL SAFETY INSPECTION
## REFERENCED FROM OSHA STANDARDS

(This checklist is to be completed by the "competent person" on a monthly basis.)

Job Location: _____ Project No.: _____

Inspected By: _____ Date: _____

Signature: _____

| | *Subject* | *OSHA Standard* | *NA* | *Yes* | *No* | *Date Inspected* |
|---|---|---|---|---|---|---|
| 1. | Are all equipment and conductors being used approved? | 1926.403(a) | | | | |
| 2. | Is all electrical equipment free from recognized hazards that are likely to cause death or physical harm? | 1926.403(b)(1) | | | | |
| 3. | Is all electrical equipment firmly secured to the surface to which it is mounted? | 1926.403(d)(1) | | | | |
| 4. | Is all electrical equipment being used marked with the Manufacturer's Name, Trademark, or another descriptive marking? | 1926.403(g) | | | | |
| 5. | Are Ground Fault Circuit Interruptors (GFCIs) being tested regularly? | 1926.404(b)(1)(iii) | | | | |
| 6. | Have cord sets and receptacles been inspected? | 1926.404(b)(1)(iii)(E) (4) and (iii)(G) | | | | |
| 7. | Are cords and cables being inspected for frays? | 1926.404(b)(1)(iii)(C) 1926.416(e) | | | | |
| | - If equipment has frayed cords, is it being removed from the work area? | 1926.404(b)(1)(iii)(C) 1926.416(e) | | | | |
| 8. | Is portable electric equipment being handled in a manner which would not cause damage? | 1926.408(a)(3) 1926.416(f)(2) | | | | |
| 9. | Have employees been informed to make visual inspection of all electrical equipment prior to their use? | 1926.416(f)(3) | | | | |
| 10. | Is work being performed near overhead lines? (If so, see questions below.) | 1926.416(g)(2) | | | | |
| | - Are overhead power lines de-energized and grounded? | 1926.416(g)(2) | | | | |
| | - Are other protective means being | 1926.416(g)(2) | | | | |

## MONTHLY ELECTRICAL SAFETY INSPECTION
## REFERENCED FROM OSHA STANDARDS

(This checklist is to be completed by the "competent person" on a monthly basis.)

Job Location: _____ Project No.: _____

Inspected By: _____ Date: _____

Signature: _____

| | *Subject* | *OSHA Standard* | *NA* | *Yes* | *No* | *Date Inspected* |
|---|---|---|---|---|---|---|
| | used (no work within 20 feet)? | | | | | |
| 11. | Has work on the project necessitated the need for lockout/tagout? | 1926.417(d) | | | | |
| | - Is the application of locks and tags being performed correctly? | 1926.417(d)(3) | | | | |
| | - Is equipment being inspected to verify that it is de-energized during lockout and tagging? | 1926.417(d)(4) | | | | |
| 12. | Are danger and high voltage signs used where necessary and required? | 1926.404(d)(2)(ii) | | | | |
| 13. | Does housekeeping in the area meet acceptable standards? | 1926.25 | | | | |
| 14. | Is the work area free of laying water (good drainage)? | 1926.20 | | | | |

## MONTHLY ELECTRICAL SAFETY INSPECTION
## REFERENCED FROM OSHA STANDARDS

(This checklist is to be completed by the "competent person" on a monthly basis.)

Job Location: _____ Project No.: _____

Inspected By: _____ Date: _____

Signature: _____

| *Equipment (Include Manufacturer's Name and Serial No.)* | *Date Inspected* | *Type of Inspection* | *Passed or Failed (If Failed, Remove From Service)* |
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# CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

TABLE OF CONTENTS

Page

CONTROL OF HAZARDOUS
ENERGY LOCKOUT/TAGOUT

# CONTROL OF HAZARDOUS ENERGY LOCKOUT/TAGOUT

## 1.0 INTRODUCTION

This procedure shall be used by all Conestoga-Rovers & Associates (hereby referred to as CRA) personnel to ensure that equipment being worked on is isolated from all potential hazardous energy sources and locked out or tagged out before any individual performs any servicing or maintenance activity where unexpected energization, startup, or release of energy could cause an injury. Energy sources can be electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy. This procedure establishes the minimum safety requirements to ensure the proper deactivation of moveable, electrically energized, pressurized equipment or systems prior to repairing, cleaning, adjusting, or performing similar work activities. This procedure complies with the requirements in 29 CFR 1910.147.

## 2.0 DEFINITIONS

| | |
|---|---|
| Affected Employee: | An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. |
| Authorized Employee: | A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section. |
| Capable of Being Locked Out: | An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability. |
| Energized: | Connected to an energy source or containing residual or stored energy. |
| Energy Isolating Device: | A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all underground supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices. |

| | |
|---|---|
| Energy Source: | Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy. |
| Hot Tap: | A procedure used in the repair, maintenance, and services activities which involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems. |
| Lockout: | The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed. |
| Lockout Device: | A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds. |
| Normal Production Operations: | The utilization of a machine or equipment to perform its intended production function. |
| Servicing and/or Maintenance: | Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy. |
| Setting Up: | Any work performed to prepare a machine or equipment to perform its normal production operation. |

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| Tagout: | The placement of a tagout device on an energy isolating control, in accordance with an established procedure, to ensure that the equipment being controlled may not be operated until the tagout device is removed. |
| Tagout Device: | A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed. |

## 3.0 RESPONSIBILITIES

### 3.1 RESPONSIBILITIES OF THE PROJECT MANAGER

It is the PM's responsibility to communicate to the Project Coordinator (PC) and/or the Site Attendant that it will be necessary to control hazardous energy as it relates to project activities.

### 3.2 RESPONSIBILITIES OF THE PROJECT COORDINATOR OR FIELD TECHNICIAN

It is the responsibility of the PC or Field Technician (FT) to implement the following components of CRA's Energy Control Program (ECP) as they relate to project activities:

i) That a proper Lockout/Tagout system is utilized for project activities.

ii) That full employee protection is achieved through the Lockout/Tagout system.

iii) That the proper energy control procedures are followed during project activities.

iv) That the proper protective materials and hardware are available for project activities (i.e., locks, tags, chains, etc.).

v) Provide for periodic inspection of energy control procedures.

vi) Provide and/or ensure training so that the procedures of the ECP are understood and the knowledge and skills required for safe application, usage, and removal of the energy controls are acquired by all appropriate project personnel.

vii) Ensure that the energy isolation is performed by only authorized personnel.

viii) Ensure that notification has been given to affected persons of the application and removal of Lockout/Tagout devices.

ix) Submit any Contractor's or Subcontractor's ECP to CRA's Industrial Hygiene and Safety Group (IHSG) for review prior to initiating energy control procedures.

## 4.0 SEQUENCE FOR LOCKOUT/TAGOUT PROCEDURE

1. The employee who is responsible for doing the work shall identify the work to be done.
2. Determine what energy sources and energy isolating devices are involved.
3. Obtain necessary locks, multiple lock adapters, tags, tools, and personal protective equipment.
4. Notify all affected individuals that a Lockout/Tagout is being implemented.
5. If the equipment is operating, shut it down by the normal stopping procedure (depress stop button, open toggle switch, etc.).
6. Isolate each energy source (electrical, mechanical, air, hydraulic, etc.) from the equipment with the appropriate switch, valve, or other energy isolating device.
7. Lockout and tagout (subject to) the energy isolating devices - with one individually assigned lock per device for each individual who is to perform the work. The key must remain in the possession of the individual who applied the lock for as long as that individual is to be protected by that lock. Use tagout only where the equipment is not lockable.
8. Stored energy must be controlled (dissipated or restrained) by methods such as grounding, repositioning, blocking, bleeding down, etc.
9. Verify De-energization. After the equipment has been locked out and/or tagged out, and after ensuring that no personnel are exposed, the employee will take the following steps and any other necessary to verify de-energization and an effective Lockout/Tagout:
   i) Operate the push button or other normal operating controls to make certain the equipment will not operate. Caution: Return operating controls to neutral or "off" position after the test.
   ii) Before performing electrical work on a circuit, verify that the circuit is de-energized and all system components discharged by use of a voltage tester. First, verify voltage tester operation on a known source in accordance with the manufacturer's guidelines.
10. Restoring Equipment to Service. The Lockout/Tagout is to be removed by the individual who applied it unless it was transferred (to protect another individual) pursuant to established procedures. Before Lockout/Tagout devices are removed and energy is restored (either for testing or normal service):

i) Ensure that tools and other servicing materials are removed.

ii) Ensure that the equipment has been properly reassembled or otherwise returned to operational status.

iii) Ensure that individuals who were working on the equipment are in a safe location outside the zone of operation.

Notify all affected individuals that the equipment is being returned to service.

## 5.0 RULES FOR USING LOCKOUT/TAGOUT PROCEDURES

1. Double check Lockout/Tagout applications yourself.
2. Do not attempt to operate any switch, valve, or other energy isolating device bearing a Lockout/Tagout.
3. Immediately notify your supervisor of any problems or unusual situations that arise in performing energy control procedures.
4. Appropriate procedures must be followed to ensure the effectiveness of Lockout/Tagout protection during and following shift or personnel changes.

   In the event an individual leaves a job that is not complete and is relieved by another individual, the procedure is:

   i) The first individual is to remove his/her Lockout/Tagout.

   ii) The second individual is to install his/her Lockout/Tagout at the same time.

   Where this is not possible or practical:

   i) The first individual may transfer his/her key or assign (using an approved form completed and signed by the first individual) his/her Lockout/Tagout to the second individual.

   ii) The second individual will promptly update the Lockout/Tagout to identify himself/herself as the person responsible for the Lockout/Tagout.

5. In the event an individual fails to remove his Lockout/Tagout and cannot be located, and it is necessary to operate the equipment, the employee will be called at home to determine if it is safe to operate the equipment. In the event the employee cannot be located, the supervisor, accompanied by a second supervisor (if on site), may remove the Lockout/Tagout after having made a thorough physical check of the machinery in question and completing and signing the Lockout Removal Record.

## 5.1 LOCKOUT/TAGOUT PROCEDURES INVOLVING MORE THAN ONE PERSON

General Rule

1. If more than one individual is required to Lockout/Tagout equipment, each shall place his or her own personal Lockout/Tagout on the energy isolating device(s).

Special Rule

1. If it is not possible or practical for every individual working on a job to place his/her Lockout/Tagout on every piece of equipment covered by Lockout/Tagout, one designated person of a work crew, or a supervisor with the knowledge of the crew, may Lockout/Tagout equipment for the whole crew. In those cases, if the device is lockable, the designated individual will place his/her key (or keys if multiple devices are involved) in a group lock box and members of the crew must attach their locks to the lock box. It is the responsibility of the designated individual to carry out all steps of the lockout procedure and inform the crew when it is safe to work on the equipment. Additionally, the designated person may not remove a crew Lockout/Tagout until it has been verified that all individuals are safely removed.

## 5.2 USE OF ENERGY ISOLATING DEVICES

1. Any energy sources not controlled by at least two control circuit devices must be controlled by a manually operated energy isolation device (electrical disconnect, circuit breaker, line valve, block, etc.).
2. This device must be in line of sight and under the control of the individual performing the work; otherwise it must be locked or tagged.

## 5.3 STORED ENERGY

1. Any stored energy not controlled by at least two control circuit devices or an energy isolating device must be released.

## 5.4 ENERGY CONTROL FOR TESTING OR POSITIONING ACTIVITIES

In some situations, equipment must be energized to test or position the equipment or its components. In those situations, Lockout/Tagout devices may be temporarily removed in accordance with standard Lockout/Tagout procedures provided the work is performed using alternative measures which provide effective protection and provided all unnecessary energy sources are locked out and tagged.

# ATTACHMENT F.5

# HEAT STRESS PREVENTION AND MONITORING

# HEAT STRESS PREVENTION AND MONITORING

Heat stress may occur at any time work is being performed at elevated temperatures. Wearing of chemical protective clothing, which may result in decreasing natural body ventilation, increases the risk of heat stress.

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur, ranging from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity movement) to fatal. Because heat stress is one of the most common and potentially serious illnesses at hazardous waste sites, regular monitoring and other preventative measures are vital.

Site workers must learn to recognize and treat the various forms of heat stress. The best approach is preventative heat stress management. In general, if possible:

1. have workers drink 16 ounces of water before beginning work, such as in the morning or after lunch. Provide disposable 4-ounce cups, and water that is maintained at 50 to 60°F. Urge workers to drink one to two of these cups of water every 20 minutes for a total of one to 2 gallons per day. Provide a cool area for rest breaks. Discourage the intake of coffee during working hours. Monitor for signs of heat stress;
2. acclimate workers to Site work conditions by slowly increasing workloads (e.g., do not begin Site work activities with extremely demanding activities);
3. provide cooling devices to aid natural body ventilation. These devices, however, add weight and their use should be balanced against worker efficiency. An example of a cooling aid is long cotton underwear which acts as a wick to absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing;
4. in extremely hot weather, conduct field activities in the early morning and evening;
5. ensure that adequate shelter is available to protect personnel against heat as well as cold, rain, snow, etc., which can decrease physical efficiency and increase the probability of both heat and cold stress. If possible, set up the command post in the shade;
6. in hot weather, rotate shifts of workers wearing impervious clothing; and
7. good hygienic standards must be maintained by frequent changes of clothing and showering. Clothing should be permitted to dry during rest periods.

Persons who notice skin problems should immediately consult medical personnel.

The following is a discussion of specific results of heat stress.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by failure of heat regulating mechanisms of the body; the individual's temperature control system that causes sweating stops working correctly. Body temperature rises so high that brain damage and death will result if the person is not cooled quickly.

- Symptoms - Red, hot, dry skin, although person may have been sweating earlier; nausea; dizziness; confusion; extremely high body temperature; rapid respiratory and pulse rate; unconsciousness or coma.
- Treatment - Cool the victim quickly. If the body temperature is not brought down fast, permanent brain damage or death will result. Soak the victim in cool, but not cold water; sponge the body with cool water or pour water on the body to reduce the temperature to a safe level (102°F). Observe the victim and obtain medical help. Do not give coffee, tea or alcoholic beverages.

Heat Exhaustion

Heat exhaustion is a state of every definite weakness or exhaustion caused by the loss of fluids from the body. The condition is much less dangerous than heat stroke, but it nonetheless must be treated.

- Symptoms - Pale, clammy, moist skin; profuse perspiration and extreme weakness. Body temperature is normal, pulse is weak and rapid, breathing is shallow. The person may have a headache, may vomit and may be dizzy.
- Treatment - Remove the person to a cool, air conditioned place, loosen clothing, place in a head-low position and provide bed rest. Consult physician, especially in severe cases. The normal thirst mechanism is not sensitive enough to ensure body fluid replacement. Have patient drink one to two cups of water immediately, and every 20 minutes thereafter until symptoms subside. Total water consumption should be about one to two gallons per day.

Heat Cramps

Heat cramps are caused by perspiration that is not balanced by adequate fluid intake. Heat cramps are often the first sign of a condition that can lead to heat stroke.

- Symptoms - Acute painful spasms of voluntary muscles (e.g., abdomen and extremities).
- Treatment - Remove victim to cool area and loosen clothing. Have patient drink one to two cups of water immediately and every 20 minutes thereafter until symptoms subside. Total water consumption should be one to two gallons per day.

Heat Rash

Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing clothes. The condition decreases ability to tolerate heat.

- Symptoms - Mild red rash, especially in areas of the body that come into contact with protective gear.
- Treatment - Decrease amount of time in protective gear and provide powder to help absorb moisture and decrease chafing.

Heat Stress Monitoring and Work Cycle Management

For strenuous field activities that are part of on-going Site work activities in hot weather, the following procedures shall be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures are to be instituted when the temperature exceeds 70°F. If possible these measures will be supplemented by the use of automatic monitoring equipment which can be worn by the workers under their PPE.

- Measure Heart Rate - Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the rate is maintained below 110 beats/minute.
- Measure Body Temperature - When ambient temperature is over 90°F, body temperatures should be measured with a clinical thermometer as early as possible in

the resting period. If oral temperature (OT) at the beginning of the rest period exceeds 99.6°F, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the OT exceeds 99.6°F at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent. The procedure is continued until the body temperature is maintained below 99.6°F.

- Physiological Monitoring Schedule - The following Suggested Frequency of Physiological Monitoring Schedule for Fit and Acclimated Workers shall be used as a guideline.

| *Temperature (Adjusted)* | *(Level D)* | *(Level C)* |
|---|---|---|
| 90°F (32.2°C) or above | After each 45 minutes of work | After each 15 minutes of work |
| 87.5°F (30.8°-32.2°C) | After each 60 minutes of work | After each 30 minutes of work |
| 82.5°-87.5°F (28.1°-32.2°C) | After each 90 minutes of work | After each 60 minutes of work |
| 77.5°-82.5°F (25.3°-28.1°C) | After each 120 minutes of work | After each 90 minutes of work |
| 72.5°-77.5°F (22.5°-25.3°C) | After each 150 minutes of work | After each 120 minutes of work |

Measure the air temperature with a standard thermometer. Estimate the fraction of sunshine by judging what percent of the sun is out.

- 100% sunshine = no cloud cover = 1.0
- 50% sunshine - 50% cloud cover = 0.5
- 0% sunshine - full cloud cover = 0.0
- Adjusted temp. = actual temp. + 13 x (% sunshine factor).

The length of work period is governed by Frequency of Physiological Monitoring. The length of the rest period is governed by physiological parameters (heart rate and oral temperature). For example, if an individual's heart rate exceeds 110 beats/minute at the beginning of the rest period, that individual will remain on rest-time until his/her heart rate drops well below 110 beats/minute and their next work period (= duration of time before suggested physiological monitoring) is decreased by 33 percent.

## COLD STRESS PREVENTION AND MONITORING

Persons working outdoors in low temperatures, especially at or below freezing are subject to cold stress. Exposure to extreme cold for a short time causes severe injury to the surface of the body, or results in profound generalized cooling, causing death. Areas of the body which have a high surface area-to-volume ratio such as fingers, toes, and ears, are the most susceptible.

Chemical protective clothing generally does not afford protection against cold stress. In many instances, it increases susceptibility. Hazardous waste Site workers must learn to dress carefully to provide chemical protection and thermal insulation while not dressing so warmly that exercise or strenuous activity will result in heat stress.

Provisions must also be made for the fact that after physical activity and accumulation of body heat, sudden chilling during decontamination and rest breaks may increase susceptibility to colds, etc.

Two factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind Chill Indices describe the chilling effect of moving air in combination with low temperature.

As a general rule, the greatest incremental increase in wind chill occurs with a wind of 5 miles per hour (mph). Additionally, water conducts heat 240 times faster than air; thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration-soaked.

Frostbite

Local injury resulting from cold is included in the generic term frostbite. Frostbite of the extremities can be categorized into:

1. frost nip or incipient frostbite is characterized by sudden blanching or whitening of skin;
2. superficial frostbite is characterized by skin with a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
3. deep frostbite is characterized by tissues that are cold, pale and solid.

To administer first aid for frostbite:

1. take the victim indoors and rewarm the areas quickly in water that is between 39°C and 41°C (102°F to 105°F);
2. give a warm drink - water or juices, no coffee, tea or alcohol. The victim must not smoke;
3. keep the frozen parts in warm water or covered with warm clothes for 30 minutes even though the tissue will be very painful as it thaws;
4. then elevate the injured area and protect it from injury;
5. do not allow blisters to be broken;
6. use sterile, soft, dry material to cover the injured areas; and
7. keep victim warm and get immediate medical care.

After thawing, the victim should try to move the injured areas a little, but no more than can be done alone, without help. Seek medical attention as soon as possible.

Note:

1. Do not rub the frostbitten part (this may cause gangrene).
2. Do not use ice, snow, gasoline or anything cold on the frostbitten area.
3. Do not use heat lamps or hot water bottles to rewarm the part.
4. Do not place the part near a hot stove.

Hypothermia

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. Its symptoms are usually exhibited in five stages:

1. shivering;
2. apathy, listlessness, sleepiness;
3. (sometimes) rapid cooling of the body to less than 95°F;
4. unconsciousness, glassy stare, slow pulse, slow respiration; and
5. death.

If hypothermia is suspected in any field personnel, move person to a warmer location until symptoms recede.

# ATTACHMENT F.6

# UTILITY CLEARANCE FORM

# PROPERTY ACCESS/UTILITY CLEARANCE DATA SHEET

(QSF-019)

PROJECT NAME: _____ PROJECT NUMBER: _____

CRA REPRESENTATIVE: _____

CLIENT: _____ CLIENT REPRESENTATIVE: _____ PHONE: _____

ON-SITE PROPERTY ACCESS APPROVAL _____ (OWNER OR AUTHORIZED AGENT SIGNATURE)

OFF-SITE PROPERTY ACCESS APPROVAL (if applicable) _____ (OWNER OR AUTHORIZED AGENT SIGNATURE)

UTILITY CLEARANCE APPROVAL _____ (OWNER OR AUTHORIZED AGENT SIGNATURE)

CONTRACTOR VERIFICATION APPROVAL _____ (OWNER OR AUTHORIZED AGENT SIGNATURE)

| UTILITIES (INDICATE THAT LOCATION/UTILITY PRESENCE WAS CHECKED) * | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Borehole/ Excavation Location | Date (m/d/y) | Telephone | Water | Storm Sewer | Sanitary Sewer | Process Sewer | Gas | Electrical | Cable | Overhead Utilities | Other | Comments/Warnings |
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Additional Comments:

_____

_____

_____

White: Field Office

Yellow: Field File

Pink: Owner/Client/Agent

* Note as appropriate, Contractor, Client or Owner, or Agent to sign, indicating no utilities are at the selected borehole/excavation locations.



THIS COMPLETED FORM IS A QUALITY RECORD

# ATTACHMENT F.7

# SEVERE WEATHER PROCEDURES

# SEVERE WEATHER

When projects are conducted outside, the potential for severe weather must be considered. Thunderstorms, tornadoes and winter storms can develop quickly, jeopardizing Site safety. The following emergency procedures are to be followed in the event of severe weather. The HSO will be responsible for monitoring the weather and will implement any or all of these procedures as necessary. These procedures were developed by Conestoga-Rovers & Associates.

## Thunderstorms and Lightning

1. Monitor weather conditions at all times while working. At a sign of an impending storm - increased cloudiness, darkened skies, increased wind listen to a radio for the latest weather information.
2. When a thunderstorm accompanied by lightning is in the project area, reduce activities or cease work immediately.
3. Perform decontamination as quickly and orderly as possible, if work stoppage is necessary.
4. Seek shelter inside nearest building or Site trailer.
5. If you are caught in an open area and you feel your hair stand on end, lightning may be about to strike you. Drop to your knees and bend forward, putting your hands on your knees. DO NOT LIE FLAT ON THE GROUND.
6. If someone has been struck by lightning, monitor life signs and begin administering mouth-to-mouth resuscitation or cardiopulmonary resuscitation as needed. Send for help.
7. Check conscious victims for burns, especially at the fingers and toes and next to buckles and jewelry. Administer first aid for shock. Do not let the victim walk around.

## Tornadoes

1. Tornadoes usually develop from thunderstorms and normally occur at the trailing edge of the storm. Most tornadoes occur in the months of April, May, June and July in the late afternoon and early evening hours.
2. When storms are predicted for the project area, monitor weather conditions on a radio. A tornado watch is issued when favorable conditions exist for the development of a tornado. A tornado warning is issued by the local weather

service office whenever a tornado has actually been sighted or is strongly indicated by radar.

3. If a tornado warning is issued, seek shelter immediately.

4. If a tornado warning is issued and you are in a vehicle or a Site trailer, leave and go to the nearest building.

5. Once a tornado has passed the Site, Site personnel are to assemble at the designated SZ area to determine if anyone is missing. Administer first aid and seek medical attention as needed.

Winter Storms

1. When snow or ice storms are predicted for the project area, Site personnel should monitor weather conditions on a radio. A winter storm watch is issued when a storm has formed and is approaching the area. A winter storm warning is issued when a storm is imminent and immediate action is to be taken.

2. When a storm watch is issued, monitor weather conditions and be prepared to halt Site activities. Seek shelter in Site buildings or the Site trailer.

# ATTACHMENT F.8

# TEMPORARY TRAFFIC CONTROL PLAN TEMPLATE

# TEMPORARY TRAFFIC CONTROL PLAN

***(Directions: Describe the Signs, Channelization Devices (tapers), Barriers and Interim Pavement Markings etc. that you will use in each of the four (4) work zone areas as presented below. Refer to the 2003 Edition of the Manual of Uniform Traffic Control Devices (MUTCD) as may be necessary. Don't forget to address pathways for pedestrians if necessary. All references identified below are from the 2003 Edition of the MUTCD.)***

**THE ADVANCED WARNING AREA –**
***(See Section 6C.04 and Table 6C-1 for distances related to the placement of Advanced Warning Signs. See Figure 6C-2 for types of tapers and Tables 6C-3 and 6C-4 for distances related to placement of tapering devices.)***
**Describe the set up of this area –**

**THE TRANSITION AREA –**
*(In addition to Figure 6C-2, Tables 6C-3 and 6C-4, see Section 6C.08 for distances related to the placement of tapers.)*
**Describe the set up of this area –**

***THE ACTIVITY AREA –***
*(See Figures 6C-1 and 6C-2 regarding Lateral Buffer Spacing and Figure 6C-2 for Longitudinal Buffer Zones.)*
**Describe the set up of this area –**

***THE TERMINATION AREA –***
*(Post and END ROAD WORK sign or use a Longitudinal Buffer Zone.)*
**Describe the set up of this area –**

**ADDITIONAL INFORMATION**
For Additional Information On:
Pathway for Pedestrians see Section 6D.01;
Flagger Control see Section 6E;
Temporary Traffic Control Zone Devices (e.g., signs) see Section 6F;
Type of Temporary Traffic Control Zone Activities (e.g., duration of set up) see Section 6G; and
Typical Applications see Section 6H.