

1036-12

**FMC** NORTHERN ORDNANCE DIVISION  
MINNEAPOLIS

**HEALTH, SAFETY  
AND SECURITY PLAN**

**Fridley, Minnesota**

TABLE OF CONTENTS

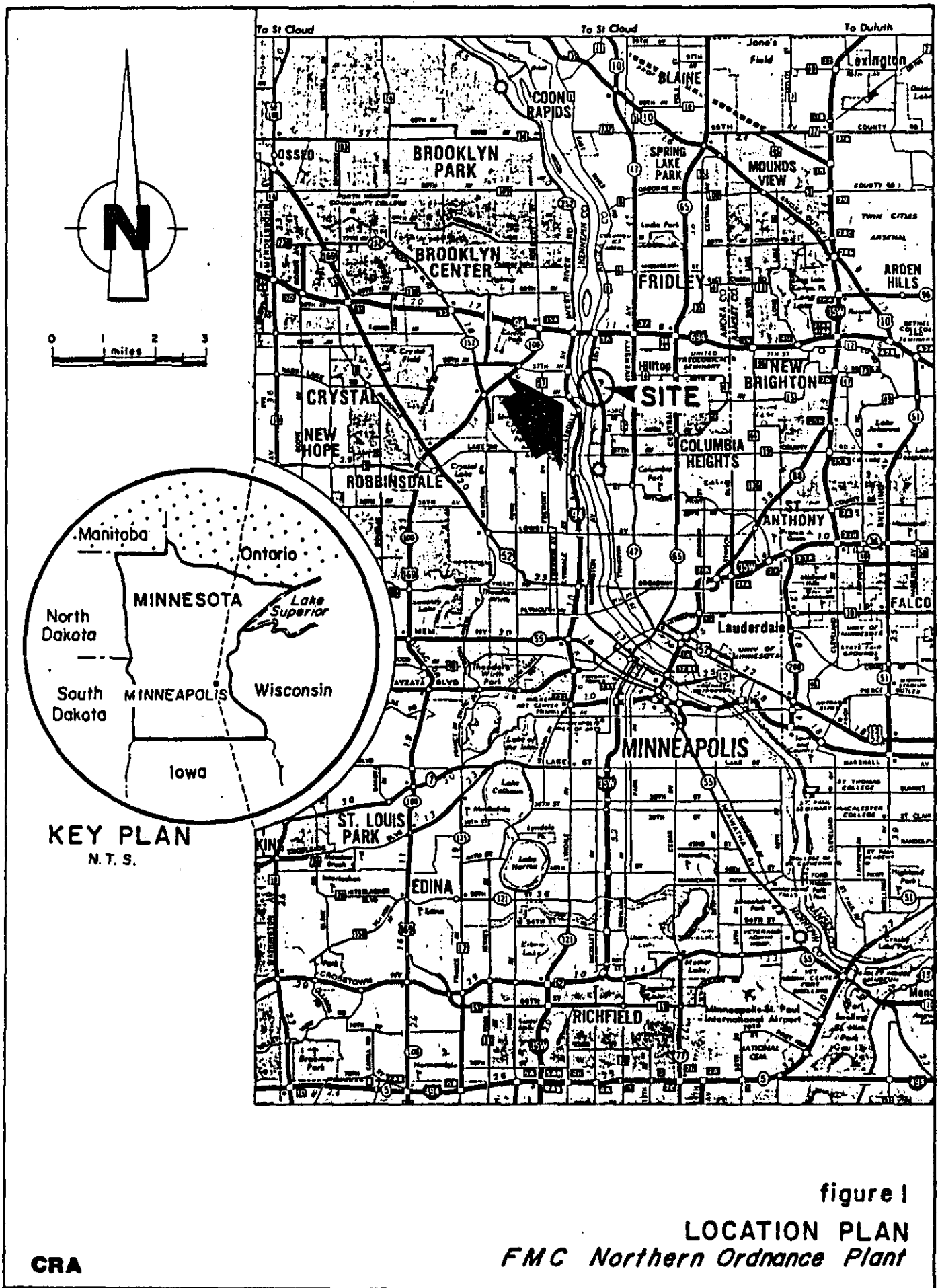
	<u>Page</u>
1.0 INTRODUCTION	1
1.1 SITE CONDITIONS	1
1.2 IDENTIFIED CONTAMINANTS	2
1.3 PROPOSED SITE ACTIVITIES	3
1.4 RESPONSIBILITIES AND ADMINISTRATION	4
2.0 GENERAL SITE REQUIREMENTS	5
2.1 SCOPE	5
2.2 BASIS	5
2.3 GENERAL PRECAUTIONS	6
2.4 MEDICAL SURVEILLANCE	7
2.5 TRAINING	8
2.6 WORK AREAS	9
2.7 PERSONAL SAFETY EQUIPMENT	12
2.8 RESPIRATORY PROTECTION	14
2.9 PERSONAL HYGIENE	15
2.10 AIR MONITORING	16
2.11 CONTAMINANT MIGRATION CONTROL	18
3.0 EMERGENCY PROCEDURES	19
3.1 FIRST AID	19
3.2 EMERGENCY AND FIRST AID EQUIPMENT AND SUPPLY	20 20
3.3 FIRES AND EXPLOSIONS	20
4.0 WELL INSTALLATION	22
4.1 EQUIPMENT CLEANING	22
4.1.1 Cleaning of Drilling Equipment	22
4.1.2. Cleaning of Drilling Equipment and Tools	22
4.2 DRILL CUTTINGS AND COLLECTED GROUNDWATER	23
4.2.1 Drill Cuttings	23
4.2.2 Groundwater Produced During Well Development	24
4.3 WASTE MATERIAL HANDLING	24
5.0 SITE SECURITY	26
5.1 TEMPORARY SECURITY FENCE	26
5.2 SECURITY PERSONNEL	26

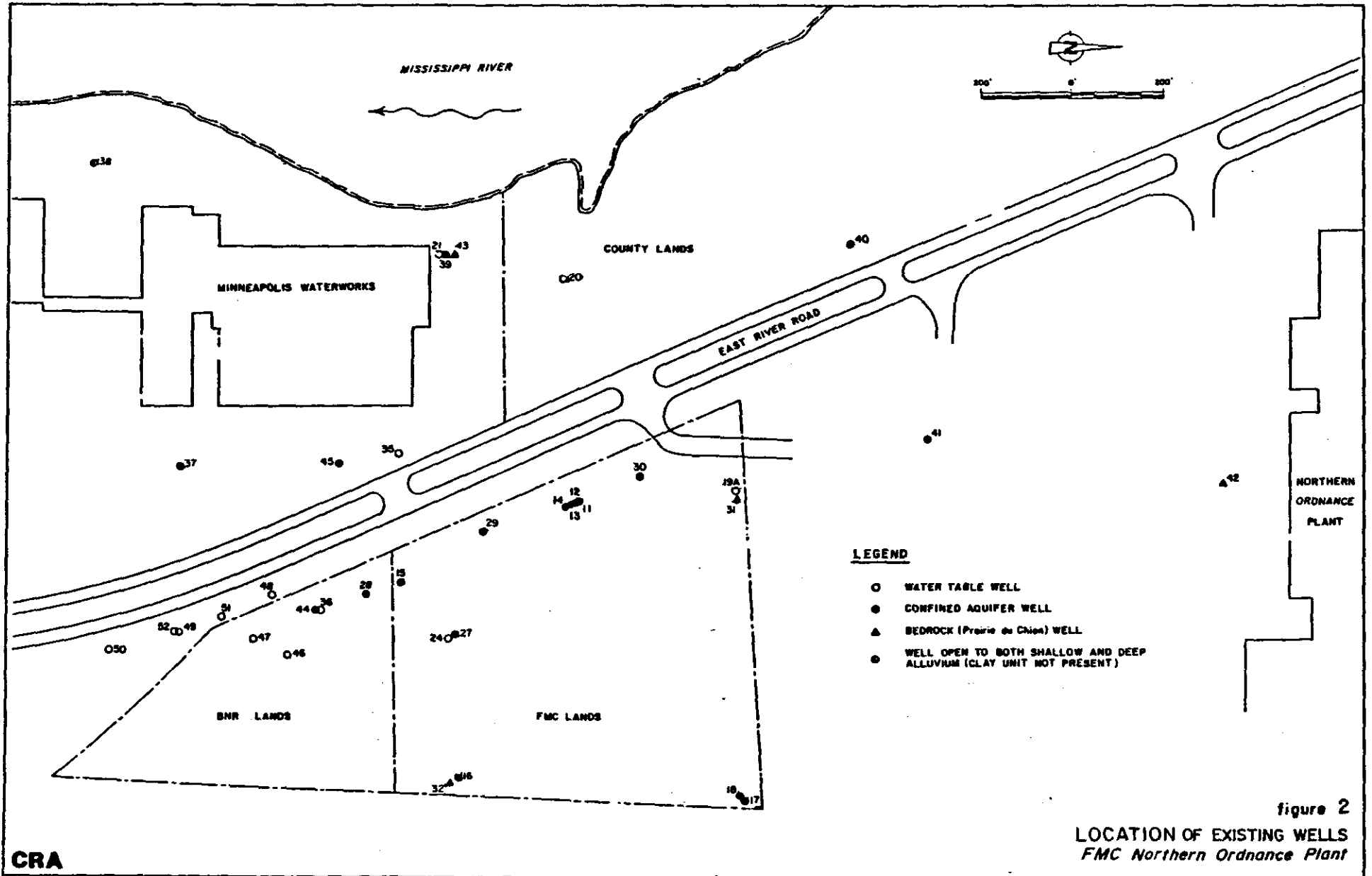
## 1.0 INTRODUCTION

The Health, Safety and Security Plan presented herein will be implemented during all phases of the remedial action program, to provide for a safe and minimal risk working environment for on-site personnel and to minimize the impact of construction activities on the general public and the surrounding environment. The construction activities will be conducted at the property south of the FMC Northern Ordnance Plant in Fridley, Minnesota (hereafter referred to as the Site). The Site location is illustrated in Figures 1 and 2. The remedial action will involve work associated with the hydraulic containment of contaminated groundwater in aquifers lying below the property with removal and treatment of this groundwater.

### 1.1 SITE CONDITIONS

Surficial soils at the Site, contaminated by past waste disposal practices, were excavated and placed in an on-site containment and treatment facility constructed for this purpose. This work was completed by July 1983. This remedial work has left the Site with uncontaminated surficial soils and good air quality. However, the Remedial Investigation (RI) conducted by FMC shows that hazardous





**CRA**

substances released from the Site have contaminated the surficial and alluvial aquifers beneath it. This Health, Safety and Security Plan will be enforced at all times that groundwater remedial activities are in progress.

## 1.2 IDENTIFIED CONTAMINANTS

The ground water in the surficial and alluvial aquifers at the Site is contaminated with a number of volatile organics, including:

1,1-dichloroethane, 1,2-dichloroethane,  
1,1,1-trichloroethane, 1,1,2-trichloroethane,  
1,1-dichloroethylene, 1,2-dichloroethylene,  
tetrachloroethylene, benzene, toluene, xylene, and  
trichloroethylene.

FMC has previously demonstrated that trichloroethylene comprises in excess of 98 percent of the contaminant loading in the aquifers.

### 1.3 PROPOSED SITE ACTIVITIES

In achieving the hydraulic containment, removal and treatment of groundwater in the aquifers underlying the Site, three or more of the following activities may be potentially performed:

- i) installation of wells in the underlying aquifers,
- ii) construction of a conveyance system for the extracted groundwater,
- iii) construction of a pumping system for extracting groundwater,
- iv) construction of an on-site system for treatment of extracted groundwater, and
- v) construction of a groundwater holding tank.

The Health and Safety Plan will be enforced at all times during the first activity, and will be implemented as appropriate during the remaining construction activities.

#### 1.4 RESPONSIBILITIES AND ADMINISTRATION

FMC and its selected Contractor will be responsible for all decisions regarding operations and work necessitated by health and safety considerations. The selected Contractor will designate an experienced health and safety technician as the Site Health and Safety Officer. This person will be on Site continuously during all construction operations.

The Health and Safety Officer will implement the air monitoring program, and ensure compliance with the requirements of the Health, Safety and Security Plan. The Health and Safety Officer and FMC site representative (Engineer) will monitor the work and cease all activities at any time that personnel or procedures are out of compliance with the requirements and intent of the Health, Safety and Security Plan.



## 2.0 GENERAL SITE REQUIREMENTS

### 2.1 SCOPE

All well installation and drilling activities at the Site will involve contact with groundwater and overburden material that may be contaminated with hazardous substances. Where there may be a potential for contact with contaminants in soils and groundwater during other remedial activities, the same health and safety precautions required for well installation work will be implemented. The Contractor will conform to the provisions of the Health, Safety and Security Plan as presented herein at all times. Should the Contractor seek relief from, or substitution for, any portion or provisions of the Health, Safety and Security Plan, such relief or substitution shall be requested of the Engineer and Health and Safety Officer in writing, and if approved, be authorized in writing. Interpretation of this section will be the exclusive prerogative of FMC or its site representative.

### 2.2 BASIS

The Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29, Code of Federal Regulations, Parts 1910 and 1926 (29 CFR 1910 and 1926) provide the basis for the Health and

Safety program. The program generally reflects the position of both EPA and NIOSH regarding procedures required to ensure safe operations at sites potentially containing hazardous or toxic materials.

The safety and health of the public and on-site personnel, and the protection of the environment will take precedence over cost and schedule considerations for all project work. The Health and Safety Officer will be responsible for decisions regarding when work will be stopped or started for health or safety considerations.

### 2.3 GENERAL PRECAUTIONS

FMC will be responsible for ensuring that all on-site personnel comply with the following general safety precautions during remedial action construction at the Site, specifically:

- i) Check that safety equipment is operated and maintained in accordance with the manufacturer's directions and applicable federal, state, and local regulations.

- ii) Inform the Contractor's employees or those of a sub-contractor of all potential hazards.
- iii) Ensure that personal hygiene procedures are adhered to within the Work Area.
- iv) Ensure that all Contractor personnel comply with all other applicable safety precautions as set out in this Health, Safety and Security Plan.

#### 2.4 MEDICAL SURVEILLANCE

A comprehensive medical monitoring program has been designed and provides for baseline examinations. This testing will determine if individuals are capable of working on-site. Additional examinations will be conducted following any acute exposure incidents, or if an employee indicates any signs or symptoms potentially attributable to an exposure to a hazardous material or stress.

The baseline examinations will consist of the following:

- i) Medical history - including an occupational and family history.

- ii) Hands-on physical examination - including measurements of vital functions.
- iii) Standard urine and blood analysis, the latter for SMA 24 or 26 parameters, plus serum arsenic and cholinesterase.
- iv) Chest X-Ray - 14" x 17" - posterior/anterior views.
- v) Pulmonary function testing.
- vi) EKG tracing.

As a result of this testing, a physician's written certification of fitness for using negative pressure respiratory protection and for suitability for the specified remedial work will be obtained. The medical examinations will be performed under the direction of a physician who is a member of the American Occupational Medicine Association.

## 2.5 TRAINING

Prior to commencing site activities for well installations the Health and Safety Officer will provide a training session for all personnel working on-site, outlining the major points presented within the Health, Safety and Security Plan. Training sessions will ensure that all personnel are capable of and familiar with the use of safety, health, respiratory and protective equipment and with the safety and security procedures required for this Site. Personnel not successfully completing the required

training will not be permitted to enter the Site to perform work. Exception to the above will be made only by the Engineer for authorized visitors.

The Contractor appointed by FMC to complete all on-site work will be solely responsible for compliance with OSHA regulations regarding his workmen's ability to perform work while fitted with respiratory protection.

## 2.6 WORK AREAS

FMC's Contractor, at the direction of the Engineer, will clearly lay out work areas in the field and will limit equipment, operations and personnel in the areas as defined below.

- i) "Dirty" Area (Hazardous Work or Contaminated Zone) - This will include all areas within the Site limits as defined by the existing security fence and the East River Road easement where contaminated groundwater and potentially contaminated overburden material are being handled, spoiled or covered, and all areas where contaminated equipment or personnel travel.

The level of personnel protective equipment required in this area will be determined by the Health and Safety Officer and approved by the Engineer after

monitoring and on-site inspection.

- ii) Potentially Contaminated Areas - This will include all areas where well installations will take place outside of the limits of the Site as defined in (i).

The level of personnel protective equipment required in this area will be determined by the Health and Safety Officer and approved by the Engineer after monitoring and on-site inspection.

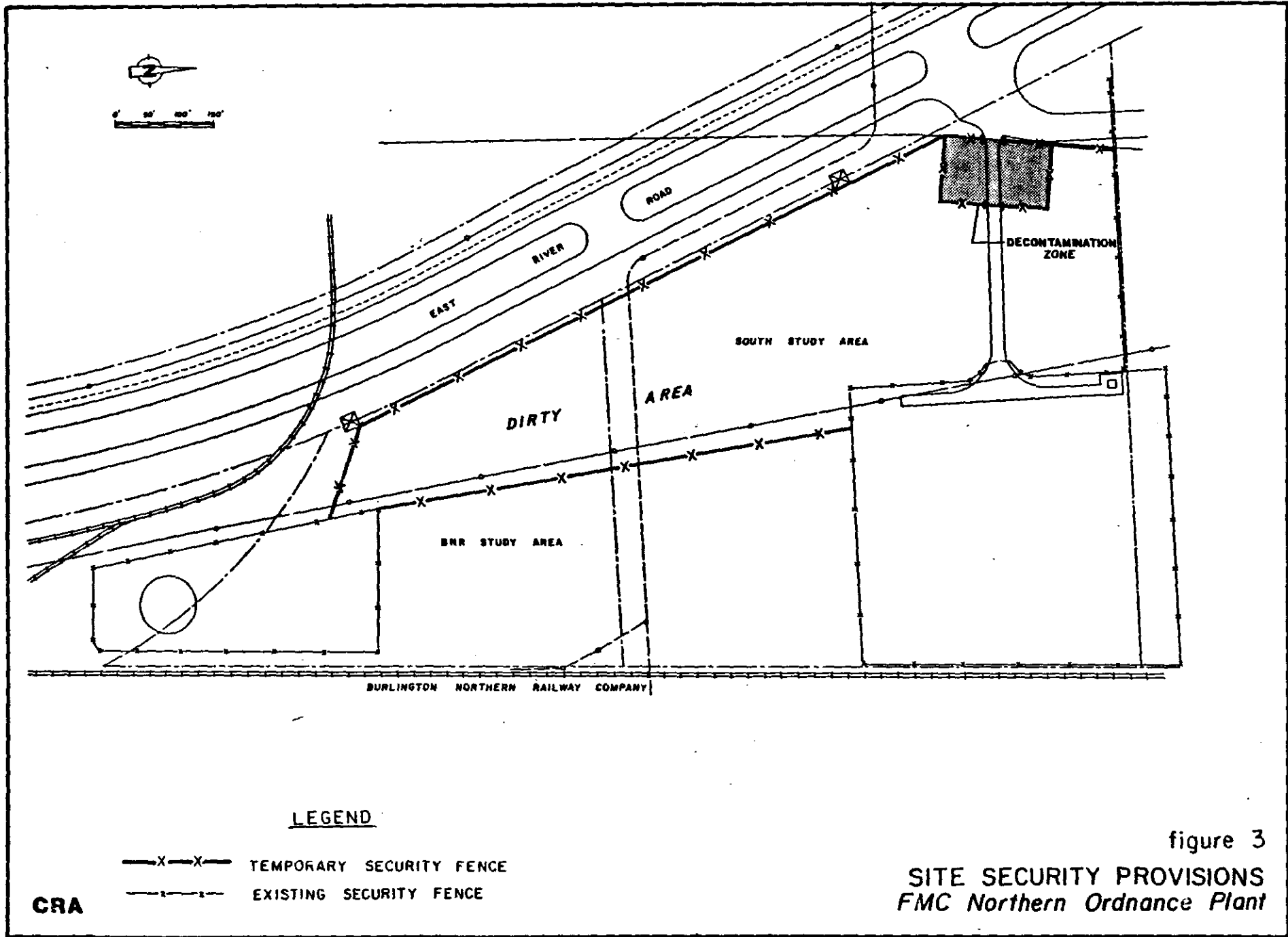
- iii) Decontamination Zone - This zone will provide for the transfer of construction materials from clean to Site dedicated equipment, the decontamination of equipment and vehicles prior to entering the "Clean" Area, and the decontamination of personnel and clothing prior to entering the "Clean" Area.

- iv) "Clean" Area - This area includes the remainder of the Site and is defined as being the area outside the zone of significant air, soil or surface water contamination. The "Clean" Area will be clearly delineated and procedures implemented to prevent any active or passive contamination from the contaminated work site. The function of the "Clean" Area includes:

- 1) An entry area for personnel, material and equipment to the "Dirty" or potentially contaminated areas of Site operations;
- 2) An exit area for decontaminated personnel, materials and equipment from the "Dirty" or potentially contaminated areas of Site operations;
- 3) A storage area for clean safety and work equipment.

Potentially contaminated areas will be clearly delineated in the field prior to commencing any sampling or well installation which may involve contact with contaminated soils. Enclosure of the Site during remedial construction will be completed using temporary security fencing along the East River Road boundary of the Site. A preliminary delineation of work areas and security fence location are indicated in Figure 3.

In the work areas located outside of the Site, the Contractor will install temporary snow fence around each well installation area. For purposes of this section each of these delineated areas will be considered to be a potentially contaminated area.





## 2.7 PERSONAL SAFETY EQUIPMENT

FMC's Contractor will insure that all on-site personnel are equipped with appropriate personal safety equipment and protective clothing. As a minimum FMC's Contractor will supply:

- i) Disposable coveralls, splash resistant Tyvec or equal
- ii) Disposable nitrile gloves and disposable latex liners
- iii) Hardhats
- iv) Safety shoes or boots
- v) Rubber overshoes or overboots, butyl rubber or neoprene
- vi) Safety glasses with side guards

Personal safety equipment will be maintained in a clean and proper working condition by the Contractor. Disposable coveralls will be replaced at least daily and more frequently if necessary.

Additional protective equipment usage

guidelines are:

- i) All prescription eyeglasses in use on the Site will be safety glasses. Contact lenses will not be worn on-site.
- ii) During periods of respirator usage in contaminated or potentially contaminated areas, respirator filters will be changed daily.
- iii) Footwear used on-site will be steel-toed safety shoes or boots, and will be covered by rubber overshoes when entering or working in the Site.
- iv) On-site personnel unable to pass a respiratory fit test will not be allowed to enter or work on the Site or in potentially contaminated zones.
- v) All on-site personnel will wear an approved hardhat when present in the "Dirty" Area.
- vi) All personal protective equipment worn on-site will be decontaminated at the end of each work day. The Contractor will be responsible for ensuring individuals decontaminate personal protective equipment before reuse.

## 2.8 RESPIRATORY PROTECTION

All on-site personnel will receive training, by the Health and Safety Officer, in the usage of both half and full face respirators. This will include canister/cartridge and supplied air types. All site personnel will carry respiratory protection as specified by the Health and Safety Officer at all times when they are within 100 feet of any well installation site or when inside the limits of the Site. The Health and Safety Officer will, by frequent air monitoring, determine when respirators must be worn by on-site personnel.

FMC's Health and Safety Officer and Engineer will monitor air within all active work areas to determine the appropriate respiratory protection to be supplied by the Contractor for on-site personnel.

In the absence of additional air monitoring information, the following levels of respiratory protection will be required.

<u>Maximum Total Organic Vapors in Breathing Zone (ppm)</u>	<u>Level of Protection</u>
Less than 5	None
5 to 25	Half-face air purifying respirator
25 to 50	Full-face air purifying respirator
25 and above	Supplied air respirator

Total organic volatile vapor readings will be obtained with an organic vapor photoionizer or an organic vapor analyzer supplied by the Engineer.

FMC's Contractor will be responsible for implementing, maintaining and enforcing the respirator program.

## 2.9 PERSONAL HYGIENE

FMC's Contractor will be responsible for, and ensure that all personnel performing or supervising the sampling or drilling work within potentially contaminated work areas, or exposed or subject to exposure to hazardous chemical vapors, liquids, or potentially contaminated solids, observe and adhere to the personal hygiene-related provisions of this section.

On-site personnel found to be disregarding the personal hygiene-related provisions of this plan will, at the request of the Health and Safety Officer or Engineer, be barred from the Site.

FMC's Contractor will supply a sufficient quantity of potable water for the washing of personnel under the personal hygiene protocol.

The Contractor will ensure that all personnel adhere to the following personal hygiene requirements:

- i) All prescribed safety equipment will be worn by all on-site personnel involved in well installation.
- ii) At the end of each shift, all disposable outerwear will be placed inside containers provided for that purpose.
- iii) Soiled disposable outerwear will be removed prior to cleansing hands and prior to eating.
- iv) All on-site personnel will thoroughly wash their hands, face and neck area prior to eating, smoking, or leaving the Site.
- v) No eating, drinking or smoking will be allowed within "Dirty" or potentially contaminated areas.

#### 2.10 AIR MONITORING

During all well installations, the Health and Safety Officer will monitor the quality of the air, in and around each active work location. Sampling will be conducted on a regular basis, and additionally as required

by special or work-related conditions. The Health and Safety Officer by downwind air sampling, will monitor air leaving the active sampling locations. Air sampling will be conducted for gases, and vapors. Any departures from general background will be evaluated by the Health and Safety Officer and the Engineer to determine when respiratory protection is required or when operations should be shut down and restarted.

Instruments required, and provided by the Engineer for air monitoring will include an explosimeter and an organic vapor photoionizer or an organic vapor analyzer.

A work location will be shut down and excavated upwind should the organic vapor level in any active work location exceed 100 ppm for any single reading, or 50 ppm for any two successive readings, or should the explosimeter indicate in excess of 20 percent of the lower explosive limit on any single reading. Work will not resume until authorized by the Health and Safety Officer and the Engineer.

## 2.11 CONTAMINANT MIGRATION CONTROL

All vehicles and equipment contacting soils or groundwater suspected to be potentially contaminated will be decontaminated within the decontamination facility prior to leaving the site of work. The Health and Safety Officer will certify that each piece of equipment has been satisfactorily decontaminated prior to removal from Site.

Decontamination will consist of the thorough cleaning of equipment, especially all downhole drilling equipment, including augers, drill rods, split spoon samplers and sampling rods, with a high pressure steam cleaner. Personnel engaged in vehicle and equipment decontamination will wear protective equipment including disposable clothing and respiratory protection.

Wash waters will be collected within the decontamination facility collection sumps and pumped to a Site dedicated, Contractor supplied, tanker truck. The Engineer will sample collected wash waters to determine requirements for disposal.

### 3.0 EMERGENCY PROCEDURES

#### 3.1 FIRST AID

All first aid will be administered as an interim medical response only until qualified medical personnel arrive or the victim is transferred to a medical facility. Plant security and medical will be notified as soon as possible following an incident requiring first aid treatment. First aid supplies and instruction manuals will be made available in on-site office trailers, and in Contractor vehicles used on Site.

As a minimum FMC's Contractor will have one Certified First Aid Technician on-site at all times. This person may perform other duties but will be immediately available to render first aid when needed. First aid will be practiced according to the procedures recommended by the American Red Cross.

In addition to first aid treatment, FMC's Contractor will co-ordinate with the Health and Safety Officer to inform local hospitals, ambulance services or paramedics of potential hazards and emergency situations at the Site, and arranging emergency response measures.



### 3.2 EMERGENCY AND FIRST AID EQUIPMENT AND SUPPLY

FMC's Contractor will supply the safety equipment listed below for use by Contractor personnel. The Contractor will locate and maintain this equipment within the work areas in appropriate locations as directed by the Engineer and the Health and Safety Officer.

- i) portable emergency eye wash
- ii) twenty pound ABC type dry chemical fire extinguishers
- iii) self contained air full face respirators
- iv) OSHA approved first aid kit sized for a minimum of 15 people
- v) full face respirator with dual organic, acid vapor, and particulate filters; self-contained breathing apparatus of positive pressure type or other supplied air system as necessary to conduct the remedial construction in a safe manner.

### 3.3 FIRES AND EXPLOSIONS

Although a remote possibility, in the event of a fire or explosion, FMC's Contractor will take the following steps in order of precedence:

- i) Determine whether the situation is life-threatening. If it is life-threatening, all on-site personnel excluding Contractor employees previously designated as essential response employees will be evacuated to designated safe areas.
- ii) Direct the response employees to take all possible measures to prevent the spread or increase in intensity of fires, and reduce the chance of explosion.
- iii) Notify security at the FMC plant and authorities for emergency assistance as required.
- iv) Make official notification and submit reports as required, outlining details of the occurrence to the appropriate government authorities.

## 4.0 WELL INSTALLATION

### 4.1 EQUIPMENT CLEANING

#### 4.1.1 Cleaning of Drilling Equipment

All drilling equipment will be cleaned prior to use on the project, and before leaving the contaminated zone of the Site. The cleaning operation will include removal of all soil with a high pressure low volume water and detergent wash. The equipment must undergo an inspection by the Engineer before leaving the Site following decontamination procedures. All equipment used in the drilling program including drill bits, drill rods, sampling tubes and rods, cables, bailers, etc., will follow the cleaning procedure outlined in Section 4.1.2 before being used.

#### 4.1.2. Cleaning of Drilling Equipment and Tools

All drilling equipment and tools that will contact potentially contaminated soil or groundwater will receive a hot water, high pressure wash before entering and leaving the Site. The wash sequence will be as follows:

- i) clean hot water and detergent wash
- ii) clean hot water rinse

All cleaning will be done on a newly constructed decontamination pad near the gate into the Site. All liquids will be removed from the sump beneath the decontamination pad and disposed of by FMC. None of the liquids will be recycled.

#### 4.2 DRILL CUTTINGS AND COLLECTED GROUNDWATER

##### 4.2.1 Drill Cuttings

All cuttings brought to the surface during the course of drilling operations by FMC's Contractor will be caught in a large pan or shallow tank set on a plastic 6-mil polyground sheet supplied by the Contractor. All cuttings caught in this manner will be placed by the Contractor on a polyground sheet and securely tarped. These materials will be stored on-site until the appropriate method of disposal is determined. FMC will arrange for proper disposal after such determination is made. The ground sheets will cover a large enough area to preclude spilling cuttings onto the ground during drilling, sampling, or when transferring cuttings to the drums. A new ground sheet will be used at each well site.

#### 4.2.2 Groundwater Produced During Well Development

All groundwater removed from a well during development will be discharged to the existing on-site sanitary sewer. FMC's Contractor will supply all equipment for the pumping and discharge of this water.

#### 4.3 WASTE MATERIAL HANDLING

Any waste material generated from the well installation program such as tyvek coveralls, gloves, and discarded ground sheets will be placed in 55-gallon steel drums.

At the end of each day, all steel drums will be securely capped and transferred to a designated staging and storage area within the Site.

## 5.0 SITE SECURITY

### 5.1 TEMPORARY SECURITY FENCE

The Site is presently enclosed on three sides by a chain link fence. The property boundary adjacent to East River Road is not fenced. A temporary security fence will be erected and maintained along this side of the Site to complete enclosure of the site during remedial construction activities. Two access gates will be provided in this fence. Figure 3 illustrates the provisions to be provided for Site Security.

### 5.2 SECURITY PERSONNEL

FMC's Contractor will be responsible for on-site security throughout the remedial construction program. Access gates to the Site will be locked at all times or manned by a dedicated security guard. Any other access points to the Site will also be manned by a dedicated security guard. Access to work areas will be limited to personnel approved by the Engineer. The distribution of gate lock keys will be approved by the Engineer.

Security personnel at the main access points to the Site will be required to limit vehicular traffic onto the site to authorized vehicles only, and to maintain a sign-in and sign-out log for visitors and site personnel.