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NIROP FRIDLEY
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RMT INC.

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703-3009
Phone: 608-255-2134
FAX: 608-255-0234

SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR ADDITIONAL INVESTIGATIONS

AT THE
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
FRIDLEY, MINNESOTA

FEBRUARY 1988

CONTRACT NO. DACA45-86-C-0015
MODIFICATION NO. P00003

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Thomas P. Kunes

Date 2-3-88 Registration No. 613728

Thomas P. Kunes, P.E.
President, Northern Region

Christine Hansen

Christine Hansen, CIHT
Industrial Hygienist

Eric Gredell

Eric Gredell, P.E.
Project Manager

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1. INTRODUCTION

1.1 Background

RMT, Inc., (RMT) was retained by the U.S. Army Corps of Engineers to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the Naval Industrial Reserve Ordnance Plant (NIROP), Fridley, Minnesota. RMT conducted one round of ground water sampling at 34 existing monitoring wells in November 1986 under a previous Scope of Services (Contract Mod. No. P00002).

The Scope of Services to be provided by RMT during these additional field investigations includes a soil gas survey, well installation, sampling, and aquifer testing. The field investigation is planned to be conducted during November 1987, to January 1988. Some of the work will be conducted on other properties adjacent to the NIROP.

1.2 Purpose

The Site-Specific Health and Safety (SSHS) Plan provides the guidelines and procedures to protect the health and safety of RMT field personnel conducting the field investigations. RMT personnel participating in the field work will be required to attend training on these guidelines and procedures before conducting or observing field activities. Specific questions regarding the health and safety plan should be addressed to the RMT Health and Safety Coordinator, Christine Hansen.

A copy of the plan will be kept in the RMT field trailer located on the NIROP property. It will be available for review by RMT personnel and authorized visitors.

1.3 Scope

The SSHS Plan is aimed specifically at protecting workers from reasonably foreseeable health and safety hazards arising from the wastes known to be at the project site, and is based upon information provided to RMT by others and upon the results of ground water sampling conducted by RMT in November 1986. This plan is to be followed during the RI field investigation tasks conducted at the NIROP and adjacent properties.

The plan has been developed based on the requirements and guidance contained in the following regulations and guidance documents: Occupational Safety and Health Administration (OSHA) Standards, 29 CFR 1910 and 1926, including 29 CFR 1910.120; U.S. Environmental Protection Agency (EPA) "Standard Operating Safety Guides," November, 1984; ER 385-1-92, "Safety and Occupational Health Document Requirements for Hazardous Waste Site Remedial Actions," August 30, 1984; NIOSH/OSHA/USCG/EPA "Occupational Safety & Health Guidance Manual for Hazardous Waste Site Activities," October 1985; and the U.S. Army Corps of Engineers Scope of Services for this Contract Modification.

This SSHS Plan is based on information available to date and is subject to revision as new data and information on potential health and safety hazards on the site become available.

1.4 Applicability

The SSHS plan applies to all personnel who participate in the field investigations. It contains minimum requirements necessary to protect on-site personnel from physical, chemical, and biological hazards

particular to this site, which have been identified as of the date of this SSHS plan. All personnel are required to comply with the approved SSHS plan while performing work related to this contract.

2. FIELD PERSONNEL HEALTH AND SAFETY TRAINING AND MEDICAL SURVEILLANCE

2.1 Health and Safety Training

Prior to the start of field activities, RMT personnel conducting or observing on-site activities will participate in the following health and safety training sessions:

- Site-Specific Health and Safety Plan - The plan will be reviewed, and any special procedures will be outlined.

- Health and Safety for Hazardous Waste Site Activities - The 40-hour training session includes the following elements: regulations, industrial hygiene, toxicology, respiratory protection, radiation, physical hazards, noise, temperature extremes, personal protective equipment, medical surveillance, air monitoring equipment, site control and decontamination, standard operating procedures, and confined space entry.

Training will be provided to a back-up field person also, so someone may be immediately available if there is an emergency at the site.

Documentation of attendance in training sessions is maintained by the RMT Personnel Department and the RMT Health and Safety Coordinator in Madison, Wisconsin.

2.2 Medical Surveillance

RMT field personnel will receive an initial medical examination prior to performing their first field assignment, and on an annual basis thereafter. The protocol for the yearly medical examination includes the following:

- Health history
- Vital signs and physical examination screen
- Pulmonary functions
- Hematology survey
- Urinalysis
- Heavy metal screen
- Blood chemistry screen (SMA-20)
- Stool for occult blood
- Vision test
- Hearing test

The initial examination includes a maximal stress treadmill exercise test with 12-point lead EKG, and chest x-ray, in addition to the above annual tests.

Field personnel assigned to conduct these investigations will have passed the required medical examination before entering the project site.

3. HAZARD EVALUATION

3.1 Chemical Hazards

The U.S. Army Corps of Engineers has provided data to RMT from ground water and soil sampling conducted previously at the project site. Detectable concentrations of metals, organic compounds, and PCBs have been measured in these previous samples. Measurable concentrations of trichloroethylene were detected in many of the wells sampled.

Data from the ground water sampling conducted by RMT in November 1986 showed detectable levels of metals and organic compounds.

3.1.1 Organic Compounds

The organic compounds detected in previous water and soil samples pose a potential health hazard through inhalation. Organic compounds such as benzene may also be absorbed through the skin. Chloroform and benzene have been previously detected in certain monitoring wells. These compounds are known or suspected carcinogens.

Organic compounds that have been detected include the following:

	OSHA Permissible Exposure Limit, ppm (time-weighted ave.)	ACGIH* Threshold Limit Value, ppm (time-weighted ave.)	Vapor Pressure, mm Hg
Toluene	200	100	22
Methylene Chloride	500	100	350
Chloroform	50	10	160
Benzene	10	10	75
1,1,1 Trichloroethane	350	350	100
1,1 Dichloroethane	100	200	182
Trichloroethylene	100	50	58
Ethyl Benzene	100	100	7
Tetrachloroethylene	100	50	14
Trichlorofluoromethane	1,000	1,000	280
1,2 Dichloroethylene	200	10	265

*American Conference of Governmental Industrial Hygienists

The primary potential routes of exposure for personnel performing field investigation tasks at the site would be the inhalation of vapors, skin contact with contaminated liquids, or accidental ingestion from contact with contaminated liquids.

3.1.2 Metals

The metals previously detected in ground water and soil samples at the project site have varying degrees of toxicity based on chronic exposures. At the low concentration levels measured, acute exposures are unlikely to result in toxic effects.

Metals that have been detected in previous sampling rounds include the following:

	OSHA Permissible Exposure Limit, mg/M^3 (time-weighted ave.)	ACGIH Threshold Limit Value, mg/M^3 (time-weighted ave.)
Arsenic	0.5	0.2
Cadmium	0.2	0.05
Chromium	0.5, 1.0	0.05, 0.5
Copper	0.1, 1.0	0.2, 1.0
Lead	0.05	0.15
Nickel	1.0	0.1, 1.0
Zinc	5.0	5.0, 10.0
Barium	0.5	0.5
Mercury	0.1	0.01, 0.05, 0.1
Silver	0.01	0.01, 0.1

The main potential route of exposure for field personnel would be accidental ingestion from contact with contaminated liquids and soil. Secondary routes of exposure would be inhalation of contaminated particulates and skin absorption of certain compounds of arsenic and mercury.

3.1.3 PCBs

Concentration levels of PCBs that have been detected at the site to date have been near the detection limits of the laboratory analytical method. There has been a lack of spatial or temporal patterns for the locations where PCBs have been detected.

The vapor pressure range of PCB compounds is reported by the National Institute for Occupational Safety and Health (NIOSH) as 0.0006 to 0.001 millimeters of mercury (mm Hg) depending on the specific PCB compound. Because of the low vapor pressure, it is unlikely for PCBs in the water and soil to volatilize significantly. Therefore, the potential for worker exposure to airborne PCB vapors is not likely to be significant. The main routes of exposure are skin contact, accidental ingestion, and inhalation of particulate matter contaminated with PCBs.

3.2 Physical Hazards

3.2.1 Temperature Extremes

The field investigations are expected to be completed by January 1988. During this time period, the normal ambient temperatures are expected to be moderate to cold. If temperatures drop below 20°F as measured by the wind chill index, thermal clothing may be required.

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 and may cause death. Areas of the body which have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible to damage.

Protective clothing generally does not afford protection against cold stress. In many instances, it increases susceptibility due to a reduction in wind chill awareness and exposure to lower than perceived ambient temperatures.

Two factors influence the development of a cold injury, ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature.

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases 10 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. Warm, dry clothing must be available and donned as soon as possible when these conditions are present.

Frostbite

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

- Frost nip or incipient frostbite is characterized by sudden blanching or whitening of skin.
- Superficial frostbite is characterized by skin with a waxy or white appearance which is firm to the touch; but the tissue beneath the skin, however, is resilient.

To administer first aid for frostbite, bring the victim indoors, and rewarm the areas quickly in warm water. Never place frostbitten tissue in hot water, as the area will have a reduced heat awareness, and

such treatment could result in burns. Give a warm drink - not coffee, tea or alcohol. The victim must not smoke. 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. Elevate the injured area and protect it from physical injury. Do not allow blisters to be broken. Use sterile, soft, dry material to cover the injured areas. Keep victim warm and get immediate medical care.

- Do not rub the frostbitten area (this may cause gangrene).
- Do not use ice, snow, gasoline or anything cold on the frostbitten area.
- Do not use heat lamps or hot water bottles to rewarm the part.
- 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 as follows:

- Shivering
- Apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F
- Unconsciousness, glassy stare, slow pulse, and slow respiratory rate
- Freezing of the extremities
- Death

Quick rewarming is essential. Bring the person into a warm room and wrapping in warm blankets or additional warm clothing.

Personnel will watch for signs of frostbite and cold exposure in themselves and team members.

Field activities should be curtailed if equivalent chill temperature (°F) as shown on the wind chill chart is below zero (°F) unless the activity is of an emergency nature.

The following wind chill chart is from the ACGIH, Threshold Limit Values for Chemical Substances in the Work Environment for 1987- 1988.

Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)*

Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	*LITTLE DANGER* In < hr with dry skin. Maximum danger of false sense of security				*INCREASING DANGER* Danger from freezing of exposed flesh within one minute.				*GREAT DANGER* Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

3.2.2 Utilities

Prior to installation of any wells, all locations of overhead and underground electric, gas, and water lines must be determined to prevent any physical hazard. Utility authorities will be contacted for location of all utility lines and necessary permits will be secured. Locations will be marked to minimize the possibility for accidents or damage.

3.2.3 Plant Operations

The field investigation activities are to be located outside of the NIROP buildings. Soil gas sampling is planned to be conducted on NIROP property and adjacent properties owned by FMC, Anoka County, and the Burlington Northern Railroad. New wells are scheduled to be installed adjacent to active railroad tracks and adjacent to a plant vehicle road.

Scheduling of the work and barricading of the work area will be established between representatives of NIROP, Burlington Northern Railroad and RMT before any work in the traffic area is to begin.

4. AIR MONITORING

4.1 Purpose

Air monitoring will be conducted to help ensure that the level of protection selected is adequate for all phases of the field investigation. Changes in the level of protection may be required if significant changes in airborne concentrations of contaminants occur.

4.2 Parameters

Total organic vapors and gases will be monitored using direct-reading equipment in the breathing zone during the soil gas survey, well installation, aquifer pumping tests, ground water sample collection, and during other activities reasonably expected to generate air contamination.

Air sampling was performed by RMT's industrial hygienist during the start-up of the soil gas survey to identify and quantify airborne concentrations of organic compounds and metals known or suspected to be present. The samples were analyzed in an American Industrial Hygiene Association accredited laboratory. The results of this air sampling are included with the SSHS Plan as Appendix A. The results have been used to evaluate the appropriate levels of protection while performing field tasks.

The field gas chromatograph will be used on-site for initial sample analysis of organic compounds, and, if applicable, these results may be used to identify compounds as measured by the direct-reading monitoring equipment.

4.3 Monitoring Equipment

The HNU Systems, Inc., model PI-101 photoionization detector (HNU) will be used as the primary instrument for routine monitoring of organic vapor concentrations. The HNU detects organic vapors in air and provides a direct read-out of the organic concentrations as parts per million equivalent to benzene. The instrument will be calibrated before use in the field with benzene span gas provided by HNU Systems, Inc.

Air samples for metals and organic vapors will be collected using SKC Model 224PCXR7 sampling pumps (or equivalent) and laboratory-supplied sampling media. The sampling flow rate will be calibrated before and after the sample period using a primary standard (or a secondary standard which has been recently calibrated against a primary standard).

4.4 Monitoring Schedule

Air monitoring using the direct-reading equipment will be conducted at the beginning of each day when the project site is entered to establish background air concentrations. Monitoring will be continued throughout the field investigation tasks. The air monitoring will be conducted in the breathing zone of the worker to determine potential exposure levels.

The site personnel performing the air monitoring will have been trained in monitoring procedures by RMT as stated in Section 2.1.

4.5 Establishing Background Levels of Air Contaminants at the Sampling Sites

The proximity of the sampling sites to sources of industrial air emissions may result in air contaminants from the industrial sources affecting the air quality at the sampling sites. The on-site air surveillance program will consider the potential effects of these other sources of air contaminants migrating to the sampling sites by establishing air quality background levels.

Background air concentrations as equivalent parts per million of benzene measured with the HNU will be established prior to initiating any site activity which requires air monitoring. This background level will be re-established if weather conditions change significantly or if industrial air emissions are significantly affecting sampling site air quality. If background concentration levels are found to present a potential health hazard, the levels of personal protection will be adjusted to provide protection from these additional exposures.

4.6 Response to Concentrations of Air Contaminants Above Background Levels

If direct-reading monitoring equipment detects significant concentrations of organic vapors and gases above background levels, the following general guidelines will be used by the Site Health and Safety Coordinator as part of decision-making criteria for establishing the approximate level of protection:

- Background to 1 part per million (ppm) above background - Level D protection as defined in Section 5.1.1 will be used.
- 1 ppm to 5 ppm above background - Level C protection as defined in Section 5.1.2 will apply.

- Greater than 5 ppm above background - Personnel will leave the immediate area and work will be suspended until the concentrations return to levels less than 5 ppm above background. If the levels persist, additional air sampling will be conducted to identify and quantify the air contaminants responsible for the excessive concentrations. After evaluation of the data, the Health and Safety Coordinator may adjust the level of protection required based on the nature and extent of the airborne substances present and the degree of hazard to which on-site personnel may be exposed.

4.7 Documentation

Air monitoring readings from direct-reading instruments will be recorded in the field log books with the date, time, location, operation, concentration levels, and any observations noted. Readings will be recorded of levels prior to the start of field activities which may cause contaminants to become airborne by disturbing contaminated soil or ground water, every 10 minutes thereafter, and whenever there is any noticeable odor.

5. LEVELS OF PROTECTION

5.1 Levels of Protection for Work Activities

In general, protective clothing must be worn whenever the potential exists for employees to come in contact with contaminated materials.

Work activities will be conducted under Level D or Level C based on the most current information available on potential health and safety hazards on the site. Additional costs associated with the additional personal protective equipment required to conduct activities in Levels A and B protection will require a Contract Modification as noted in RMT's revised proposal dated September 18, 1987.

5.1.1 Level D Protection: Background to 1 ppm Above Background

Based on an evaluation of the data and information available to date, it has been determined that the field personnel can be adequately protected from potential health hazards present, using Level D protection as long as significant airborne contaminant concentrations are not present. Hence, all field work will be conducted under Level D restrictions unless the direct-reading instruments indicate that concentrations are exceeding 1 ppm above background.

During on-site activities, the field personnel will wear the following protective clothing:

- Work boots
- Eye protection; either splash goggles or a full-face shield
- Impervious overboots
- Impervious gloves
- Polylaminated Tyvek suits

Air-purifying respirators with combination organic vapor/HEPA cartridges, will be available to on-site personnel.

5.1.2 Level C Protection: 1 ppm to 5 ppm Above Background

Level C requirements for field personnel protection include the protective clothing specified for Level D plus air-purifying respirators which must be worn when working in Level C.

5.1.3 Level B Protection: Greater than 5 ppm Above Background

Level B protection requires that a self-contained breathing apparatus be used on-site. As stated in Section 4.6, if air contaminant concentrations exceed 5 ppm above background, work will stop until concentrations return to levels less than 5 ppm above background, or until the Health and Safety Coordinator determines that Level B protection is to be implemented, and the required equipment has been obtained.

5.2 Changes in Levels of Protection

The Health and Safety Coordinator may authorize a change in the minimum level of protection required based on an evaluation of actual field conditions.

New air monitoring data may reveal the presence of concentrations of organic vapors or other air contaminants above acceptable levels for the type of respiratory protection being used. If this occurs, the Health and Safety Coordinator will evaluate the need to modify the level of protection required in a particular area. If changes in the level of

protection are warranted, the Health and Safety Coordinator will inform the field personnel and the RMT Project Manager of the changes. The Corps' Project Manager will also be notified of this change by telephone.

5.3 Work Limitations

- No smoking will be allowed in the work zones.
- No eating or drinking will be allowed in the work zones.
- All field personnel and equipment leaving the work zones must be properly decontaminated prior to leaving the site.
- A minimum of two persons will be on-site during work activities.

6. SITE CONTROL

6.1 Purpose

The purpose of site control is to minimize the transfer of contaminants from and within the project site. Two contamination control methods are 1) establishment of work zones at the project site; and 2) decontamination of field personnel and equipment.

6.2 Work Zones

To prevent the spread of contaminants during the work, an exclusion zone, contamination reduction zone, and support zone will be delineated by use of yellow caution ribbon. Figure 1 shows locations of proposed sampling and well installation sites.

6.2.1 Exclusion Zone

The exclusion zone is the zone where contamination does or could occur. During field activities at the project site, the area immediately surrounding each boring or sampling location is considered to be the exclusion zone. The applies to properties adjacent to the NIROP, as well as work conducted on NIROP property. All personnel entering this zone must wear the required protective equipment.

Because the potential for exposure to contaminants will occur at each location, the boundary for each exclusion zone will be defined by the area required to perform the tasks. Field personnel will attempt to minimize the area required to perform the tasks, thereby minimizing the area defined as the exclusion zone.

AREA 2
PIT & TRENCH DISPOSAL
& UPGRADIENT
SOURCE EVALUATION

AREA 3 :
TCE STORAGE & POTENTIAL
UPGRADIENT SOURCE EVALUATION

AREA 1
TCE STORAGE &
STORM SEWER LINES

BACKGROUND

LEGEND

- WATER TABLE OBSERVATION WELL IN UNCONSOLIDATED SEDIMENTS
- INTERMEDIATE DEPTH PIEZOMETER IN UNCONSOLIDATED SEDIMENTS
- DEEP PIEZOMETERS IN UNCONSOLIDATED SEDIMENTS
- BEDROCK PIEZOMETERS
- PRODUCTION WELLS
- PORE GAS SURVEY AREAS
- NIROP APPROXIMATE PROPERTY LINE
- FMC APPROXIMATE PROPERTY LINE
- BNR APPROXIMATE PROPERTY LINE

SCALE : 1" = 200'
0 200 400 600 FEET

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT :
A-E QUALITY CONTROL PLAN
COE-NIROP FRIDLEY, MINNESOTA

SHEET TITLE :
FIGURE 1
SAMPLING AND WELL LOCATION MAP

DRAWN BY: JM	SCALE : 1"=200'	PROJ . NO . 1332.23
CHECKED BY:		DRWG . NO .
APPROVED BY:	DATE PRINTED : FEB 3 1988	
DATE : SEPT, 1987		

RMT INC
Suite 124
1406 East Washington Ave.
Madison, WI 53703
Phone: 608-255-2134

6.2.2 Contamination Reduction Zone

The contamination reduction zone is between the exclusion and support zones. This is a transition between contaminated (or potentially contaminated) and clean zones and serves as a buffer to reduce the possibility of the clean zone becoming contaminated.

Decontamination of field personnel and equipment will be done in the contamination reduction zone.

Field personnel will wear the required personal protection while working in the contamination reduction zone. Protective equipment worn in the contamination reduction zone will be removed before entering the support zone.

6.2.3 Support Zone

The support zone is a noncontaminated or clean area. Support equipment (clean protective equipment, supplies, etc.) will be located in this zone which will be the RMT trailer area. Normal work clothing is appropriate in this zone.

The location of the support zone and any support facilities will be determined based on the following factors:

- Wind direction - preferably the support zone should be located upwind of the exclusion zone.
- Accessibility.
- Support services - electric power supply, roads, drinking water, etc.

6.3 Decontamination Procedures

6.3.1 Field Personnel

Decontamination procedures will be as follows:

- Protective outer garments will be removed and placed in disposable plastic bags at the perimeter of the exclusion zone (see Section 6.2.1 for definition of exclusion zone) each time before leaving the exclusion zone.

- Boots will be removed first and then gloves.

- Field personnel will wash and dry their hands and all exposed surfaces before leaving the contamination reduction zone, and used paper towels will be placed in the disposal bag.

- The plastic bags containing waste materials will be disposed on-site daily in a dumpster designated by the authorized Naval Plant Representative.

Clean outer garments will be kept accessible to field personnel in an area free from potential contamination.

Water, soap, and paper towels will be kept in a clean location for both regular clean-up and emergency use.

6.3.2 Sampling and Drilling Equipment

Sampling equipment used in the field will be decontaminated following standard procedures as required by the sampling methodology. Equipment to be decontaminated includes stainless steel wire leader, bailers, submersible pumps, augers, split spoons, and any other sampling equipment that may come into contact with potentially contaminated soil or ground water. The equipment will be cleaned with a methanol wash and distilled water rinse which will discharged onto the ground.

The drilling rig, drilling tools, and associated equipment will be cleaned with a portable steam cleaner at the drilling site immediately after completing the drilling process.

7. CONTINGENCY PLAN

7.1 Purpose

This contingency plan provides the emergency information needed should there be a sudden, life- or health-threatening action where work activities are being conducted.

The provisions of the contingency plan are to be implemented immediately in the event of a fire, explosion, or accident which could threaten human health or the environment. All personnel on-site will be informed of the contingency plan and their responsibilities under it.

7.2 Emergency Contacts

Emergency contacts and phone numbers for use in emergency situations occurring during field activities are as follows:

- Fridley Police, Fire, and Ambulance — 911
  (Ambulance response time, 5-10 min.)

- Unity Medical Center, Fridley — 612/780-6845
  DIRECTIONS: Proceed north on East River Road to I694, right (east) onto I694, approximately 1/4 mile, then north on Hwy. 47 (University Avenue) approximately 2 miles, and right onto Osborne Road. SEE MAP

- U.S. Naval Plant Representative,
  Mel Vojvodich — 612/572-6451

- U.S. Army Corps of Engineers, Omaha, Nebraska
  Project Manager - Tom Thiele — 402/341-1118
  Geologist - Tomiann McDaniel — 402/221-4497

- RMT, Inc., Office, Madison, Wisconsin
  Project Manager - Eric Gredell — 608/255-2134 (Office)
  608/241-8834 (Home)

  Site Health and Safety Coordinator -
  Cathy Kwiatkowski — *

Health and Safety Coordinator Madison Office -
Christine Hansen 608/255-2134

* Contact via Mel Vojvodich, (612) 572-6451

7.3 Emergency Procedures

If an emergency situation develops at the site, the discoverer will take the following course of action:

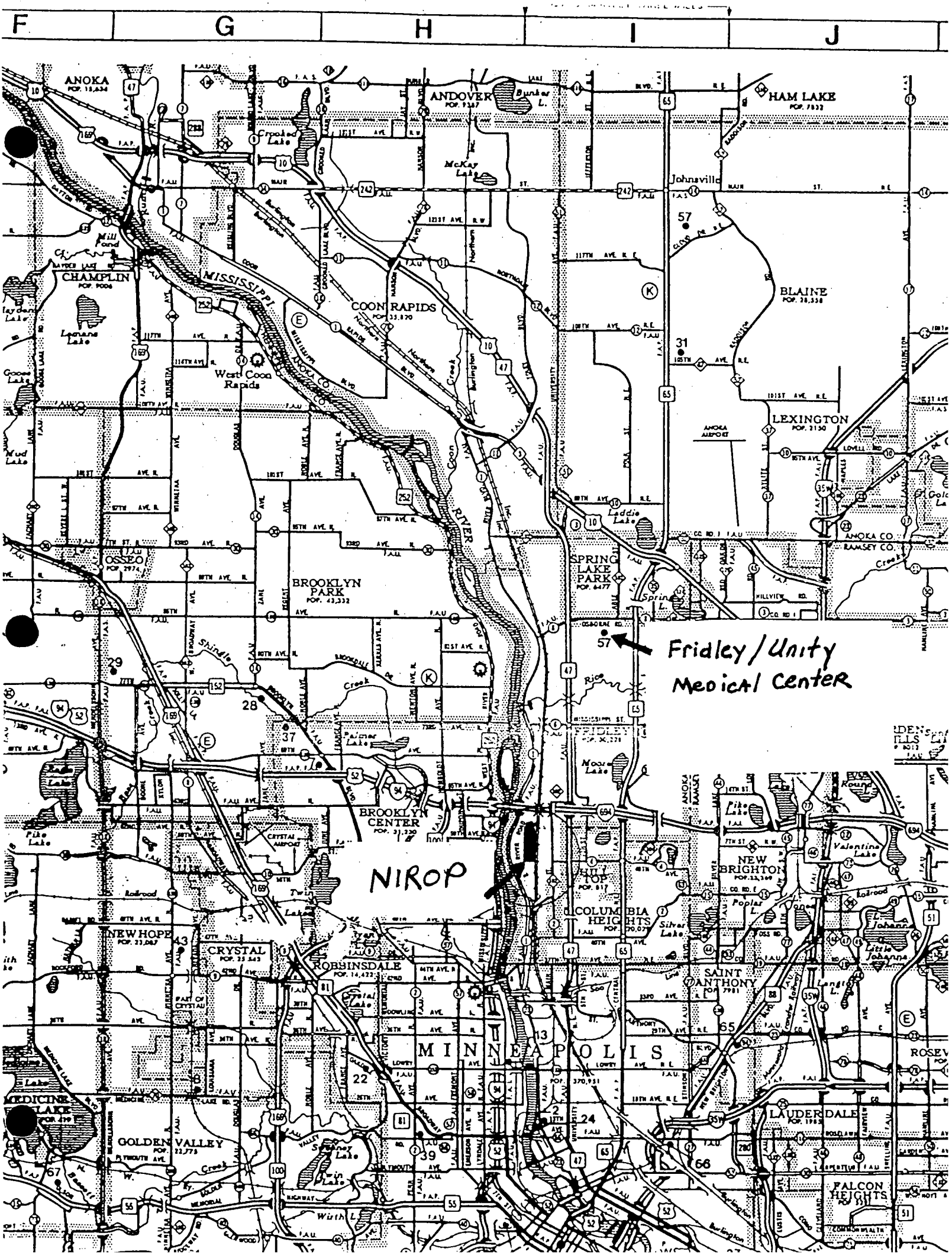
- Notify the proper emergency services (fire, police, or ambulance) for assistance.
- Notify any other affected personnel at the site.
- Contact RMT's Site Health and Safety Coordinator (Cathy Kwiatkowski), the RMT Project Manager (Eric Gredell), the U.S. Naval Plant Representative (Mel Vojvodich), and the COE Project Manager (Tom Thiele) to inform them of the incident as soon as possible.
- Prepare a summary report of the incident for RMT, the U.S. Naval Plant Representative, and the U.S. Army Corps of Engineers.

7.4 Emergency Equipment

Emergency equipment that will be on-site with RMT field personnel will include the following:

- First aid kit
- Clean water for emergency wash

A map showing the route from the facility to the medical center is shown on Figure 2. A copy of the map will be kept in the front seat of the RMT vehicle.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ANOKA
ANDOVER
HAM LAKE
CHAMPLIN
COON RAPIDS
BLAINE
LEXINGTON
OSSEO
BROOKLYN PARK
SPRING LAKE PARK
FRIDLEY
BROOKLYN CENTER
NIROP
COLUMBIA HEIGHTS
NEW BRIGHTON
NEW HOPE
CRYSTAL
ROBBINSDALE
SAINT ANTHONY
MINNEAPOLIS
LAUDERDALE
GOLDEN VALLEY
FALCON HEIGHTS
MISSISSIPPI
RIVER
Fridley/Unity Medical Center

APPENDIX A

LABORATORY RESULTS OF AIR MONITORING CONDUCTED NOVEMBER 5 AND 6, 1987

TABLE 1

AIRBORNE CONCENTRATIONS OF METALS MEASURED NOVEMBER 6, 1987
(measured as milligrams of metal per cubic meter of air, mg/M^3)

RMT Sample Number	Sample Location/ Description	Sample Time Period	Airborne Metals Concentrations Measured in mg/M^3	OSHA PEL* (in mg/M^3)	ACGIH TLV* (in mg/M^3)
2965	Area sample, south side of TCA tank, by sampling site SG 20	9:31 a - 3:10 p	Lead, 0.003	0.05	0.15

*The OSHA Permissible Exposure Limit and ACGIH Threshold Limit Value® are given as an 8-hour time-weighted average.

TABLE 2
AIRBORNE ORGANIC COMPOUNDS MEASURED NOVEMBER 5 AND 6, 1987
(measured as parts of organic compound per million parts of air, ppm)

RMT Sample Number	Sample Location/ Description	Sample Time Period	Airborne Organic Compounds Concentrations Measured in mg/M^3	OSHA PEL* (in mg/M^3)	ACGIH TLV* (in mg/M^3)
November 5, 1987					
Breathing Zone, Greg Wiecks					
2955	Soil gas analysis at SG 18, also completed soil sampling (hand auger)	8:35 a - 9:33 a	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
2956	Soil gas analysis at SG 9	10:25 a - 12:07 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
2957	Soil gas analysis at SG 11	2:23 p - 2:57 p and 3:15 p - 4:00 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
Area Samples					
2958	West side of concrete decon pad	2:20 p - 4:36 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400

TABLE 2 (CONT'D)
AIRBORNE ORGANIC COMPOUNDS MEASURED NOVEMBER 5 AND 6, 1987
(measured as parts of organic compound per million parts of air, ppm)

RMT Sample Number	Sample Location/ Description	Sample Time Period	Airborne Organic Compounds Concentrations Measured in mg/M^3	OSHA PEL* (in mg/M^3)	ACGIH TLV* (in mg/M^3)
November 5, 1987					
Area Samples (Cont'd)					
2959	At fence line, between new water line and Midwest Printing	2:26 p - 4:35 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
2960	Adjacent to SG 12 (down wind from SG 11 during soil gas analysis)	2:24 p - 4:33 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
November 6, 1987					
Breathing Zone, Greg Wiecks					
2961	Soil gas analysis at SG 10, 12, and 13	8:40 a - 11:32 a	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride trace	500	50
			Isopropanol, trace	400	400
2967	Dropping off samples (Tedlar® bags) and decon of probes	11:32 a - 11:58 a	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400

TABLE 2 (CONT'D)
AIRBORNE ORGANIC COMPOUNDS MEASURED NOVEMBER 5 AND 6, 1987
(measured as parts of organic compound per million parts of air, ppm)

RMT Sample Number	Sample Location/ Description	Sample Time Period	Airborne Organic Compounds Concentrations Measured in mg/M^3	OSHA PEL* (in mg/M^3)	ACGIH TLV* (in mg/M^3)
November 6, 1987					
Breathing Zone, Greg Wiecks (Cont'd)					
2969	Installing soil probes at SG 14, 15, and 16	12:52 p - 3:24 p	1,1,1 trichloroethane, < 1	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
Area Samples					
2963	Midway between sampling sites SG 19 and 20	9:33 a - 11:25 a	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
2964	South side of concrete decon pad	10:00 a - 11:40 a	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
2966	South side of RMT job trailer	11:26 a - 1:14 p	Propane, < 1	1,000	**
			1,1,1 trichloroethane, trace	350	350
2968	Far northeast corner of property line	11:43 a - 1:20 p	None detected	--	--

TABLE 2 (CONT'D)
AIRBORNE ORGANIC COMPOUNDS MEASURED NOVEMBER 5 AND 6, 1987
(measured as parts of organic compound per million parts of air, ppm)

RMT Sample Number	Sample Location/ Description	Sample Time Period	Airborne Organic Compounds Concentrations Measured in mg/M^3	OSHA PEL* (in mg/M^3)	ACGIH TLV* (in mg/M^3)
November 6, 1987					
Area Samples (Cont'd)					
2970	East property line, along road by RR tracks, parallel to RMT job trailer location	1:19 p - 3:11 p	1,1,1 trichloroethane, < 1	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400
2971	South of SG 14, 15 while probes are being installed	1:31 p - 3:25 p	1,1,1 trichloroethane, < 1	350	350
			Methylene chloride, trace	500	50
			Isopropanol, trace	400	400

* The OSHA Permissible Exposure Limit and ACGIH Threshold Limit Value® are given as an 8-hour time-weighted average.

** Propane is listed by the ACGIH with no TLV. The factors limiting the allowable concentration are the precent of oxygen in the air and explosion hazard.

STATE LABORATORY OF HYGIENE
UNIVERSITY OF WISCONSIN
CENTER FOR HEALTH SCIENCES

In Reply Please Refer to
Wisconsin Occupational Health Laboratory
979 Jonathon Drive
Madison, WI 53713
(608) 263-6550

RECEIVED

DEC 2 1987

December 1, 1987

Chris Hansen
RMT
1406 E. Washington Avenue
Madison, WI 53703

RE: Project #1332.30

Dear Chris:

Below are results for samples we received from you on November 10, 1987 for analysis:

Sample #	Lab #	Results
2955	137678	Propane <1 ppm
2956	137679	Propane <1 ppm
2957	137680	Propane <1 ppm
2958	137681	Propane <1 ppm
2959	137682	Propane <1 ppm
2960	137683	Propane <1 ppm
		The above samples contain a trace of 1,1,1 trichloroethane, methylene chloride and isopropanol.
2961	137684	Propane <1 ppm
2962	137685	Propane <1 ppm
2963	137686	Propane <1 ppm
2964	137687	Propane <1 ppm
2966	137688	Propane <1 ppm
2967	137689	Propane <1 ppm
		The above samples except 137685 contain a trace of 1,1,1 trichloroethane. Trace of propane in blank 137685 was subtracted to give sample results. 137684, 686, 689: trace methylene chloride & isopropanol.
2968	137690	1,1,1 trichloroethane = none-detected
2969	137691	1,1,1 trichloroethane <1 ppm
2970	137692	1,1,1 trichloroethane <1 ppm
2971	137693	1,1,1 trichloroethane <1 ppm
		Trace methylene and isopropanol in 137691, 692, & 693.

Samples contain a trace of propane <u>or</u> hexane equivalents; levels were too low to confirm.

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Madison, WI 53713
(608) 263-6550

RMT (cont)

If you have any questions regarding these results, please feel free to contact me.

Sincerely,

Terry

Terry Burk, Chemist Supervisor III

TB/ms

CB RMT

SOLVENT SAMPLE RESULTS
Received on NOV. 10, 1987

The solvent samples were collected on activated charcoal, returned to the lab where they were desorbed with carbon disulfide and injected into a Hewlett-Packard gas chromatograph equipped with flame ionization detectors.

Analysts - JIM BLAIR

Date reported DEC. 1, 1987

WISCONSIN OCCUPATIONAL HEALTH LABORATORY
STATE LABORATORY OF HYGIENE

STATE LABORATORY OF HYGIENE
UNIVERSITY OF WISCONSIN
CENTER FOR HEALTH SCIENCES

In Reply Please Refer to
Wisconsin Occupational Health Laboratory
979 Jonathon Drive
Madison, WI 53713
(608) 263-6550

RECEIVED RMT, INC

November 24, 1987

NOV 25 1987

Chris Hansen
RMT
1406 E. Washington Avenue
Madison, WI 53703

RE: #1332.30

Dear Chris:

Below are results for samples we received from you on November 10, 1987 for analysis:

Sample #	Lab #	Results
2965	137694	Lead = 0.003 mg/m3
2972	137695	Lead = 1.430 µg/filter

If you have any questions regarding these results, please feel free to contact me.

Sincerely,

Terry

Terry Burk, Chemist Supervisor III

TB/ms

METALS SAMPLES RESULTS
Received on NOV. 10, 1987

The filters were digested using an appropriate acid or acids and then diluted with distilled water to a known volume. Samples were then run on a Jarrell-Ash Plasma Emission Spectrograph for heavy metals. Those with appreciable concentrations are reported.

Analysts - DOUG SMIEJA

Date reported NOV. 23, 1987

WISCONSIN OCCUPATIONAL HEALTH LABORATORY
STATE LABORATORY OF HYGIENE