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DRAFT REMEDIAL INVESTIGATION WORK PLAN HEALTH AND SAFETY PLAN VOLUME 3
OF 3 CORRY STATION NAS PENSACOLA FL
12/1/1993
NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

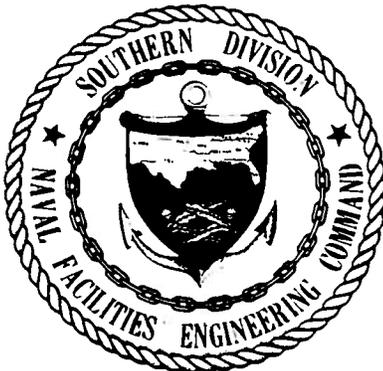


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DECEMBER 1993

**RI WORK PLAN
VOLUME III OF III
HEALTH AND SAFETY PLAN**

**CORRY STATION
PENSACOLA, FLORIDA**



**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA
29411-0068**

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SITE SPECIFIC HEALTH AND SAFETY PLAN

For the Phase II
Soil and/or Ground Water Contamination Investigation and
Modeling for the Naval Technical Training Center (NTTC)

At

Corry Station
Pensacola, Florida

December 1, 1993

Prepared For:

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04/29/94

NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Project Name and Number: **Contamination Assessment Investigation - Phase II
Workplan**

Project Site Location: **Corry Station - Pensacola, Florida**

Project Manager: **Thomas Pratt, P.G., NFWFMD**

Site Safety Coordinator: **Chris Richards, P.G., NFWFMD**

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Preparation Date: **December 1, 1993**

APPROVED:

Office Health and Safety Coordinator

(Date)

Executive Officer, Northwest Florida Water
Management District, Havana, Florida

(Date)

Project Manager

(Date)

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SUMMARY

**Site-Specific Health and Safety Plan for
the Contamination Assessment
Phase II Workplan
at the Naval Technical Training Center (NTTC), Corry Station
Pensacola, Florida**

Section

PROJECT MANAGER: Thomas Pratt, P.G.

SITE SAFETY COORDINATOR: Chris Richards, P.G.

- 2.1 SUBCONTRACTING: FILL OUT STATEMENT OF COMPLIANCE ON PAGE 5
- 3.5 EMERGENCY INFORMATION:
- 3.6 EXPOSURE LIMITS AND RECOGNITION QUALITIES: TABLE 3-1
- 5.2 MONITORING REQUIREMENTS: TABLE 5-1

<u>Monitoring Instruments</u>	<u>Action Levels</u>	<u>Protective Measures</u>
Flame Ionization Detector (FID)	< 5 ppm 5-20 ppm > 20 ppm	Level D Level C Level B or Evacuate

6.0 PERSONAL PROTECTIVE EQUIPMENT

Field activities will be initiated using Level D protective equipment

Level C protection will be available onsite and will be used if the action levels are reached

- 10.0 STANDARD OPERATING PROCEDURES
- 11.0 EMERGENCY RESPONSE PLAN
- 12.0 HAZARD COMMUNICATION
- 13.0 POSTING OF NOTICE
- 14.0 FORMS: Complete and Return to Office Safety Coordinator

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CONTENTS

1.0	PURPOSE	1
2.0	APPLICABILITY	2
3.0	SITE CHARACTERIZATION AND ANALYSIS	5
3.1	General Information	5
3.2	Site Description	5
3.3	Description of Work and Hazard Evaluation	7
3.3.1	<u>Description of Work</u>	7
3.3.2	<u>Hazard Evaluation</u>	7
3.3.2.1	Chemical Agents	8
3.3.2.2	Industrial Safety Hazards	8
3.3.2.2.1	Existing Objects and Terrain	9
3.3.2.2.2	Elevated Work Areas	9
3.3.2.2.3	Lifting Heavy Objects	9
3.3.2.2.4	Moving Machinery and Falling Objects	9
3.3.2.2.5	Personal Protective Equipment	10
3.4	Field Personnel	10
3.5	Emergency Information	10
3.5.1	<u>Emergency Contacts</u>	10
3.5.2	<u>Location of Site Resources</u>	11
3.5.3	<u>Location of Hospital/Clinic</u>	11
3.6	Chemical and Physical Properties of Hazardous Substances	11
4.0	SITE CONTROL	16
4.1	General	16
4.2	Site Work Zones	16
4.3	Standard Safe Work Practices	17
4.3.1	<u>General</u>	17
4.3.2	<u>Buddy System</u>	18

CONTENTS (continued)

5.0 MONITORING 19

5.1 General 19

5.2 Monitoring Requirements 19

 5.2.1 Instrument Calibration 21

 5.2.1.1 FID Calibration 21

 5.2.2 Background Readings 22

 5.2.3 Air Monitoring Frequency 22

6.0 PERSONAL PROTECTIVE EQUIPMENT 23

6.1 General 23

6.2 Levels of Protection 23

6.3 Respiratory Protection 23

6.4 Personal Protective Equipment Program 25

7.0 DECONTAMINATION 26

7.1 Level D Decontamination Procedures 26

7.2 Level C Decontamination Procedures 26

7.3 Decontamination of Equipment 26

 7.3.1 Sampling Devices 27

 7.3.2 Tools 27

 7.3.3 Respirators 27

 7.3.4 Heavy Equipment 28

 7.3.5 Sanitizing of Personal Protective Equipment 28

 7.3.6 Persistent Contamination 28

 7.3.7 Disposal of Contaminated Materials 29

7.4 Minimal Decontamination 29

7.5 Closure of the Personnel Decontamination Station 29

8.0 EMPLOYEE TRAINING ASSIGNMENTS 30

8.1 General 30

CONTENTS (continued)

8.2 Initial Training30

8.3 Management and Supervisor Training 30

8.4 Refresher Training 30

8.5 Additional Training Requirements 31

9.0 MEDICAL SURVEILLANCE 32

9.1 General 32

9.2 Frequency of Medical Exams 32

9.3 Medical Surveillance Program 33

10.0 STANDARD OPERATING PROCEDURES 34

10.1 Organizational Structure and Responsibilities 34

10.1.1 NFWWMD Project Manager 34

10.1.2 NFWWMD Site Safety Officer 34

10.1.3 NFWWMD Site Personnel 36

10.2 Reporting of Accidents and Unsafe Conditions 36

10.3 Heat Stress 37

10.4 Drilling Safety 43

10.4.1 Basic Requirements 43

10.4.2 General Requirements at Drilling

Operations 43

10.4.2.1 Housekeeping 43

10.4.2.2 Flammable Liquids 44

10.4.2.3 Public Safety 44

10.4.3 Off-Road Movement of Drill Rigs 44

10.4.4 Drilling Equipment 45

10.4.4.1 Skid Mounted Units 45

10.4.4.2 Overhead and Underground Utilities 46

10.4.4.3 Site Selection and Working Platforms 48

10.4.5 Surface Drilling Operations 49

CONTENTS (continued)

10.4.6	<u>Use of Augers</u>	51
10.4.7	<u>Use of Handtools and Portable Power Tools</u>	53
10.4.8	<u>Use of Ropes, Chains, and Accessories</u>	54
10.4.8.1	Slings	55
10.4.8.2	Wire Rope	55
10.4.8.3	Fiber and Synthetic Fiber Rope	56
10.4.8.4	Chains	56
10.4.8.5	Hoists	56
11.0	EMERGENCY RESPONSE PLAN	59
11.1	Pre-Emergency Planning	59
11.2	Personnel Roles and Lines of Authority	59
11.3	Emergency Recognition	60
11.4	Emergency Medical Treatment Procedures	60
11.5	Fire or Explosion	61
11.6	Spills or Leaks	61
11.7	Emergency Information	61
11.7.1	<u>Emergency Contacts</u>	61
11.7.2	<u>Location of Site Resources</u>	62
11.7.3	<u>Location of Hospital/Clinic</u>	62
12.0	HAZARD COMMUNICATION	64
12.1	General	64
12.2	Compliance Requirements	64
13.0	POSTING OF NOTICE	66
14.0	FORMS	67
15.0	MSDS SHEETS	68

FIGURES

<u>No.</u>		<u>Page</u>
3-1	Site Location Map	6
3-2	Emergency Route to Hospital Map	13
11-1	Emergency Route to Hospital Map	63

TABLES

<u>No.</u>		<u>Page</u>
3-1	Exposure Limits and Recognition Qualities	14
3-2	Health Hazards and First Aid	15
5-1	Hazard Monitoring Methods, Action Levels, and Protective Measures	20
6-1	Protective Equipment for Onsite Activities	24
10-1	Accident Reporting Guidelines	40
10-2	Signs and Symptoms of Heat Stress	41
10-3	Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers	42

APPENDICES

Appendix A Proposed Monitor Wells and Locations

1.0 PURPOSE

The purpose of this Site-Specific Health and Safety Plan (HSP) is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide for contingencies that may arise during site operations.

2.0 APPLICABILITY

The provisions of the plan are mandatory for all on-site Northwest Florida Water Management District (NFWWMD) employees who are engaged in hazardous material management activities including, but not limited to, initial site reconnaissance, preliminary field investigations, mobilization, project operations, and demobilization. This plan has been developed under U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (EM 385-1-1 October 1992), and Florida Department of Labor and Employment Security, Division of Safety guidelines and complies with applicable regulations, including Occupational Safety and Health Administration (OSHA) standards [29 Code of Federal Regulations (CFR) 1910 and 1926].

The NFWWMD will insist on the following health and safety requirements from its subcontractors:

- Subcontractor employees must have appropriate training [i.e., either a 40-hour or 24-hour OSHA-required (29 CFR 1910.120) health and safety course for hazardous waste work, or certified equivalent training].
- Personnel working at hazardous waste sites must have had an annual physical (or physician's waiver for biennial physical) and be certified "fit for duty" and "fit for respirator use," if necessary, by a qualified physician.
- NFWWMD will insist on obtaining proof of both training and a physical before site work may begin.
- Personnel must have appropriate personal protective equipment (PPE) for the specific job. At a minimum, personnel should have the following equipment, which will be inspected by the NFWWMD:
 - Hard hat
 - Safety shoes
 - Gloves

- Goggles/safety glasses
 - Hearing protection, if appropriate
 - Respiratory protection, if appropriate (with fit test)
 - Other equipment as specified by the HSP.
- Drilling equipment and field operations must meet applicable safety standards and satisfy the NFWFMD's field inspection. Unsafe equipment or operations will necessitate shut down of the job at a cost to the subcontractor.

Before field activities begin, the subcontractor must develop a health and safety plan and have it approved by the NFWFMD. The NFWFMD will provide a copy of its Health and Safety Plan, but this is not a substitute for an independent plan by the subcontractor. If the subcontractor has not developed a site-specific health and safety plan, the NFWFMD will assist the subcontractor in preparing its own separate, site-specific HSP for implementation by the subcontractor. The subcontractor must agree to comply with at least the minimum requirements of its own site-specific HSP, be responsible for the health and safety of its own employees, and sign the Subcontractor Statement of Compliance for all on-site employees before site work begins. The subcontractor also must agree that it will take any additional measures it deems necessary to meet at least minimum applicable health and safety standards if unforeseen circumstances arise.

The subcontractor will provide at least minimum safety equipment as required by the site-specific HSP. When respirators are necessary, the subcontractor will provide a respirator fit test certificate and a physician's "fit for respirator use" declaration.

**Subcontractor
Statement of Compliance**

This is to confirm that the employees listed below are qualified by virtue of training and experience to engage in field activities at Corry Station, Pensacola, Florida in connection with the Contract/Subcontract Agreement between the NFWFMD and _____, dated _____, 19_____.

Further, all said employees have been determined to be properly trained and medically fit to perform those activities prescribed by said contract and to use the respiratory protective equipment necessary to perform the job safely in accordance with 29 CFR 1910 and 1926 and any other Federal, State, or local requirements.

Employee Names

1. _____

6. _____

2. _____

7. _____

3. _____

8. _____

4. _____

9. _____

5. _____

10. _____

Authorized Subcontractor Representative

Printed Name

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3.0 SITE CHARACTERIZATION AND ANALYSIS

3.1 General Information

Site Location: The site is located at NTTC Corry Station, Pensacola, Florida. Figure 3-1 shows the site location.

Objectives: To conduct site investigation activities by installing monitor wells and piezometers, drilling soil borings, testing aquifer hydraulic properties, and sampling and analyzing ground water, surface water, soil, soil gas, and sediments at several areas where previous studies indicate potential contamination problems.

Waste Types: Liquid: X Solid: X Sludge: Gas: X

Proposed Date of Investigation: _____

Characteristics: Corrosive: Ignitable: X Radioactive:
Volatile: X Toxic: Reactive: Unknown:

Unusual Site Features: None

Status:

Background Review: Complete: X Preliminary:

Documentation/Summary (Overall Hazard): Serious: Moderate:
Low: X Unknown:

3.2 Site Description

The NTTC Corry Station is comprised of four principle areas: the Naval Technical Training Center (NTTC); the Naval Hospital; Navy Shopping Mall; and Corry Family Housing. The site is located approximately 1.5 miles west of the City of Pensacola, Florida and is presently used for the training of Naval personnel in cryptology, electronic warfare, photography, and optical and instrument repair.

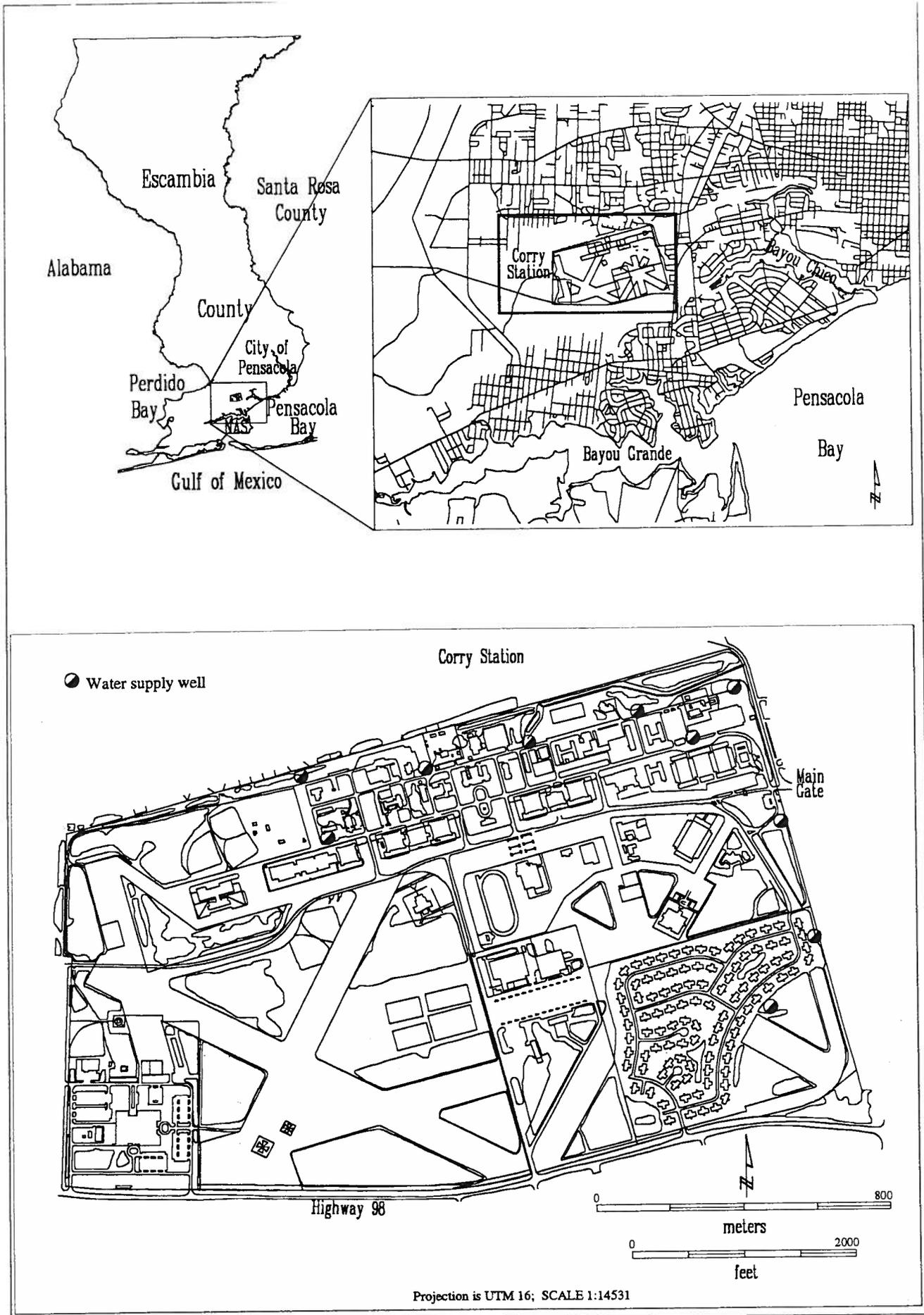


Figure 3-1. Site Location Map.

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Historically, hangers used for training were located at the site. In addition a former aviation fuel depot, with underground storage tanks, was located on the site.

3.3 Description of Work and Hazard Evaluation

3.3.1 Description of Work

NWFWMD's site investigation will consist of the installation of approximately 30 deep monitor wells, 40 shallow monitor wells, 30 soil samples, and 60 ground water samples. Locations of the proposed monitor wells are found in Appendix A.

Shallow and deep soil samples will be collected. Soil sampling will utilize two different methodologies, depending upon the depth of sample to be collected. Shallow soil sampling will be to a depth of approximately five feet BLS will be collected utilizing trowels, soil sampling probes and hand augers. Deeper soil samples will be collected every five feet by split spoon method. Organic vapor analysis, using a Flame Ionization Detector (FID), will be performed on all unsaturated samples, as well as, hollow stem auger drill cuttings, at five feet intervals between land surface and the water table.

Sediment samples from beneath the surface waters will be collected from the sediment/water interface to a depth of four inches and submitted to a Florida Department of Environmental Protection (FDEP) approved laboratory for analyses.

Ground water samples will be collected from the installed monitor wells and submitted under chain-of-custody to a FDEP approved laboratory for analyses.

The possible contaminants of concern are benzene, dieldrin, and tetrachloroethylene. Other chemical analyses will be performed on selected samples.

3.3.2 Hazard Evaluation

Personnel may be exposed to a variety of substances and physical agents while working at the task site. Exposures may be a result of contacting materials stored, handled, or disposed; equipment being used; weather conditions or time of day; environmental surroundings; and/or task specific work conditions.

The following sections provide general information on the types of potential exposures that may be encountered while working at task sites.

3.3.2.1 Chemical Agents

Exposure to chemical agents may result when personnel come in contact with gaseous, liquid, or solid materials encountered at the investigation sites. Personnel shall make every effort to avoid direct contact with disposed or hazardous materials. Task operations personnel may be exposed to contamination through inhalation, ingestion, absorption (skin/eye), and injection (puncture wound).

- Inhalation of hazardous materials can occur due to lack or improper use of respiratory equipment, malfunctioning monitoring equipment, presence of undetected chemicals, or chemicals in quantities greater than the respiratory equipment protection limits.
- Digestive system may be affected by hazardous substances when workers do not practice good personal hygiene habits (e.g., washing hands thoroughly after completion of work and before smoking, eating, drinking, and chewing gum or tobacco). Inhaling or swallowing airborne substances may also produce adverse effects to the digestive system.
- Skin absorption of solid, liquid, or gaseous hazardous substances can occur through cuts or abrasions. Skin absorption can occur when a worker does not wear proper protective clothing or a breach of clothing has occurred.
- Eye irritation may develop from solid, liquid, or gaseous contaminants. This irritation may occur when a worker does not wear proper eye protection or when unwashed hands come in contact with the eyes.
- Hazardous substances may be injected into the body through puncture wounds occurring from contaminated equipment with sharp edges or protrusions.

3.3.2.2 Industrial Safety Hazards

Numerous unsafe conditions or actions may be encountered. These may include:

- Existing objects and terrain,
- Elevated work areas,
- Lifting heavy objects,
- Moving machinery,
- Personal protective equipment, and
- Task related equipment.

Task operations personnel should look for potential hazards and immediately inform the PM of those hazards so that action can be taken to minimize injury due to an unsafe condition or action.

3.3.2.2.1 Existing Objects or Terrain

Existing objects or terrain can present safety hazards such as:

- Holes and ditches,
- Precariously positioned objects (e.g., drums or boards that may fall),
- Sharp objects (e.g., nails, metal shards, and broken glass),
- Slippery surfaces,
- Overhead power lines,
- Steep grades,
- Uneven terrain,
- Unstable surfaces (e.g., walls that may collapse or floors that may give way), and/or
- Ladders/stairs.

Additional safety hazards introduced by the task should be listed in the task specific addendum.

3.3.2.2.2 Elevated Work Areas

During the task activities, personnel may be required to work on elevated equipment. When such work must be performed, personnel required to work under these conditions shall be trained in the use of elevated equipment.

3.3.2.2.3 Lifting Heavy Objects

Personnel may risk injury by lifting heavy objects. All personnel should be trained in proper method of lifting heavy equipment and cautioned against lifting objects that are too heavy. Mechanical and hydraulic assists will be used whenever possible to minimize lifting dangers.

3.3.2.2.4 Moving Machinery and Falling Objects

Personnel may be subject to lacerations and contusions when activities involve moving machinery and falling objects. Injuries can be minimized by wearing protective clothing, hard hats, steel-toed boots, and using mechanical assists whenever possible. Loose clothing should not be worn and hair should be secured when personnel work around equipment with moving parts or any other potentially hazardous piece of equipment. All moving and rotating machinery must be properly guarded and guarding must remain in-place.

3.3.2.2.5 Personal Protective Equipment

Wearing PPE may reduce a worker's ability to move freely, see clearly, and hear directions and noise that might indicate a hazard. Also, PPE can increase the risk of heat stress. Personnel must adjust their work activities to accommodate limitations.

3.4 Field Personnel

The field team will consist of the following persons:

Project Manager:	Thomas Pratt, P.G.
Site Safety Coordinator:	Chris Richards, P.G.
Site Manager:	To Be Determined
Field Technicians:	To Be Determined

3.5 Emergency Information

3.5.1 Emergency Contacts

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone No.</u>
Security	Corry Security	904/452-6119
Fire	NAS Pensacola Fire Department	904/452-3333
Ambulance	Escambia County	911
Hospital	Baptist Hospital	904/434-4011
Poison Control	Baptist Hospital	904/434-4011
Client Contact	Ron Joyner - PWC Facilities - Environmental Coordinator	904/452-4515
NFWMD Project Manager	Thomas Pratt, P.G.	904/539-5999
NFWMD Project Director	Christopher Howell, Ph.D.	904/539-5999
Agency Safety Coordinator	Kim Dupree-Wiggins	904/539-5999

3.5.2 Location of Site Resources

Water Supply: NTTC Building - As designated by PWC Utilities Department

Telephone: NTTC Corry Building 517, Corry Station Base Civil Engineers Office

3.5.3 Location of Hospital/Clinic

The hospital to be utilized, if needed, is the Baptist Hospital located on "A" Street, Pensacola, Florida. The route map to the hospital is presented in Figure 3-2 and a description of the route to the hospital is:

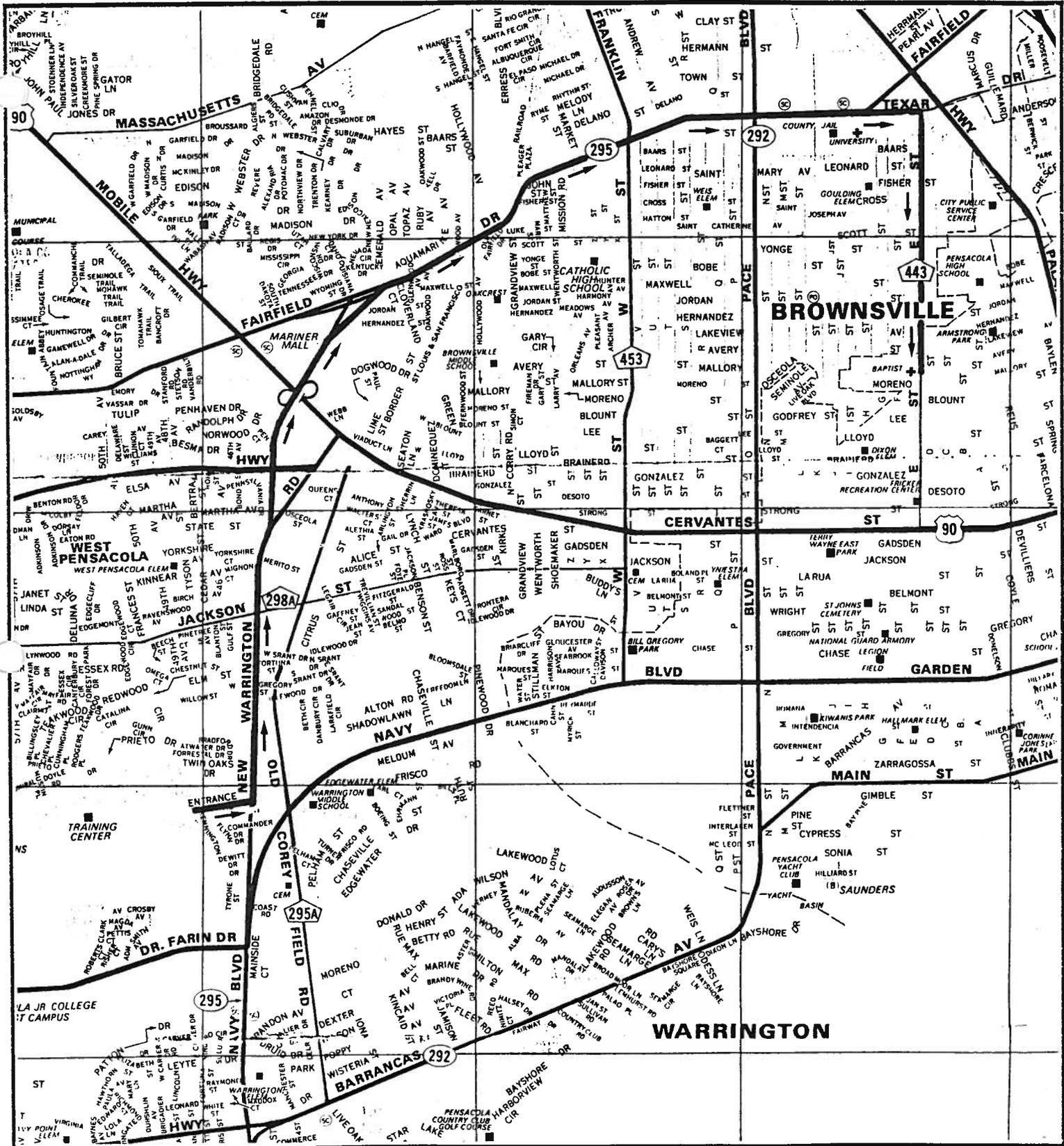
- Leave the east gate of Corry Station;
- Turn left (north) onto New Warrington Road/S.R. 295 and proceed north, approximately three miles, on New Warrington Road to Fairfield Drive/also S.R. 295;
- Turn right (east) onto Fairfield Drive and proceed east, approximately three miles, to the turn-off for Texar Drive;
- Continue straight onto Texar Drive until the intersection with E Street/C.R. 443
- Turn right, onto E Street, and proceed south, approximately one mile, to the hospital's emergency room entrance.

3.6 **Chemical and Physical Properties of Hazardous Substances**

The exposure limits, recognition qualities, acute and chronic effects, and first aid treatments for hazardous chemicals expected to be found at the site are presented in Tables 3-1 (Exposure Limits and Recognition Qualities) and 3-2 (Health Hazards and First Aid). These tables were compiled from the following sources:

- OSHA 29 CFR Part 1910.1000 et seq., "Air Contaminants," U.S. Department of Labor, Washington, DC, July 1, 1992.

- National Institute of Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, Department of Health and Human Services (DHHS) Publication No. 90-117, June 1990.
- Threshold Limit Values and Biological Exposure Indices for 1992-93, American Conference of Governmental Industrial Hygienists (ACGIH).
- Amoores, John E., and Earl Hautala, 1983. "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, Vol. 3, No. 6.



PROJECT: PHASE II SOIL AND/OR GROUND
 WATER CONTAMINATION INVESTIGATION
 AND MODELING FOR THE NTT
 LOCATION: CORRY STATION, PENSACOLA, FLORIDA
 DATE: OCTOBER 29, 1993

EMERGENCY ROUTE
 TO HOSPITAL

FIGURE 3-2

**TABLE 3-1
EXPOSURE LIMITS AND RECOGNITION QUALITIES**

Compound Name	PPM TLV/PEL (a)	PPM STEL (b)	PPM IDLH (c)	Skin Designation	PPM Odor/Threshold	% LEL (d)	Ionization Potential (ev)
Benzene	0.1	5	Carcinogenic	N/A (e)	61	1.3	9.25
Dieldrin	0.02 (skin)	0.06 to 0.1	450 mg/m ³	Avoid Skin Contact	N/A	Non-flammable	No Data
Tetrachloroethylene	100	200	Carcinogenic	N/A	N/A	8.0	9.32

- a) The most stringent of either the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) (1989) or the American Conference Governmental Industrial Hygienists (ACGIW) Threshold Limit Value (TLV)
- b) Short Term Exposure Limit - 15 minute exposure
- c) Immediately Dangerous to Life and Health
- d) Lower Explosive Limit
- e) Not Available

TABLE 3-2

HEALTH HAZARDS AND FIRST AID

Compound Name	Routes of Entry	Eye Irrigation	Symptoms	Target Organs
Benzene	Ingestion; Absorbtion Contact Inhalation	Yes	Irritated nose & respiratory system, giddy, headache, nausea, staggered gait, fatigue, anorexia, lassitude, dermatitis, bone marrow depression, carcinogenic	blood, central nervous system, skin, bone marrow, eyes, respiratory system
Dieldrin	Ingestion; Absorbtion Contact Inhalation	Yes	Headache, dizziness, nausea, vomiting, malaise, sweating, erythemic muscle spasms, tonic convulsions, coma, carcinogenic in animals, liver and kidney damage	skin, central nervous system, liver, kidneys
Tetrachloroethylene	Ingestion; Contact Inhalation	Yes	Irritated eyes, nose, throat, nausea, flushed face, neck, vertigo, dizziness, incoordination, headache, somnolence, erythema, carcinogenic	Liver, kidneys, eyes, upper respiratory system, central nervous system

15

DIPART

NOTE: General First Aid Treatment

EYE: IRRIGATE IMMEDIATELY

SKIN: SOAP WASH PROMPTLY

INHALATION: MOVE TO FRESH AIR

INGESTION: GET MEDICAL ATTENTION

4.0 SITE CONTROL

4.1 General

The purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism. Site control is especially important in emergency situations. Several site control procedures will be implemented to reduce worker and public exposure to chemical, physical, biological, and safety hazards.

4.2 Site Work Zones

To prevent the accidental spread of hazardous substances from a contaminated area to a clean area, zones will be delineated on the site where various operations will occur. The site may be divided into a minimum of three zones, dependent upon results of field monitoring during work activities, and are as follows:

- The Exclusion Zone--The area where contamination is either known or likely to be present or, because of activity, will potentially harm personnel. **Entry into the Exclusion Zone requires the use of PPE.**
- The Contamination Reduction Zone--The area where personnel and equipment are decontaminated. It is essentially a buffer zone between contaminated areas and clean areas. **Activities to be conducted in this zone will require personal protection as defined in Section 6.0.**
- The Support Zone--The area situated in clean areas where the chance to encounter hazardous materials or conditions is minimal; therefore, **PPE is not required.**

4.3 Standard Safe Work Practices

4.3.1 General

The following general safe work practices apply:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited in contaminated or potentially contaminated areas, or where there is a possibility for the transfer of contamination.
- Contact with potentially contaminated substances should be avoided. Puddles, pools, mud, etc., should not be walked through. Kneeling, leaning, or sitting on equipment or the ground should be avoided, whenever possible. Monitoring equipment should not be placed on a potentially contaminated surface, such as the ground.
- Spillage should be prevented, to the extent possible. In the event that spillage occurs, the liquid should be contained, if possible.
- Splashing of contaminated materials should be prevented.
- Field crew members should use all their senses to alert themselves to potentially dangerous situations (i.e., presence of strong, irritating, or nauseating odors).
- Field crew members should be familiar with the physical characteristics of investigations, including:
 - Wind direction in relation to the ground zero area
 - Accessibility to associates, equipment, and vehicles
 - Communications
 - Hot zones (areas of known or suspected contamination)
 - Site access
 - Nearest water sources

- Routes and procedures to be used during emergencies.
- A minimum number of personnel and equipment should be in the contaminated area, but only to the extent consistent with work force requirements of safe site operations.
- All wastes generated during the NFWFMD or subcontractor activities at the site must be disposed of as directed by the Project Manager.
- No one wearing contact lenses or having a beard will be permitted in the work area if Level C or higher protection is required.

4.3.2 Buddy System

Workers will conduct all site activities with a buddy who is able to:

- Provide his or her partner with assistance
- Observe his or her partner for signs of chemical or heat exposure
- Periodically check the integrity of his or her partner's protective clothing
- Notify the site supervisor if emergency help is needed.
- Prearrange hand signals or other emergency communication signals such as:
 - Hand gripping throat: out of air, can't breathe.
 - Gripping partner's wrist or placing both hands around waist: leave area immediately, no debate.
 - Hands on top of head: need assistance.
 - Thumbs up: okay, I'm alright, I understand.
 - Thumbs down: no, negative.

5.0 MONITORING

5.1 General

Monitoring will be performed for the hazards presented in Table 3-1 to ensure proper selection of engineering controls, work practices, and PPE so that employees are not exposed to levels that exceed permissible exposure limits or published exposure levels for hazardous substances. Air monitoring will be performed to identify Immediately Dangerous to Life and Health (IDLH) conditions, exposure over permissible exposure limits or published exposure levels, or other dangerous conditions such as the presence of flammable atmospheres or oxygen-deficient environments. Periodic monitoring will be conducted in the event of an IDLH condition or flammable atmosphere or when there is an indication that exposure levels may have risen, such as:

- When work begins on a different portion of the site.
- When contaminants other than those previously identified are being handled.
- When a different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling).
- When employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., spill or lagoon).

5.2 Monitoring Requirements

Equipment necessary for site monitoring consists of an organic vapor analyzer (OVA). The type of monitoring instrument specified by the hazard, as well as the action levels to upgrade personal protection, are shown Table 5-1. All ambient measurements taken to evaluate employee exposures must be taken in the individual's breathing zone and must be fairly constant for at least 30 seconds.

TABLE 5-1

**Hazard Monitoring Methods, Action Levels,
and Protective Measures**

<u>Hazard</u>	<u>Monitoring Method</u>	<u>Action Level</u>	<u>Monitoring Schedule</u>	<u>Protective Measures</u>
Organic vapors	FID	Up to 5 ppm above background in the breathing zone	Periodically (every 30 minutes) during invasive field activities	Level D
		5-20 ppm	Periodically (every 30 minutes) during invasive field activities	Level C
		> 20 ppm	Periodically (every 30 minutes) during invasive field activities	Level B or EVACUATE AREA

5.2.1 Instrument Calibration

All applicable instruments will be calibrated daily and after use. Readings will be recorded on the Daily Instrument Calibration Checksheet provided in Section 13.0.

5.2.1.1 Flame Ionization Detector Calibration

- Battery check--Depress the function switch for BATTERY. The needle should be in the green region; if not, recharge the battery.
- Turn machine on--Depress ON/OFF switch.
- Set the unit on a flat horizontal surface. The instrument must remain in this position throughout the calibration procedure.
- The meter needle should be set to zero by turning the zero control knob.
- Depress the 500 ppm range switch.
- There should not be significant drift or movement of the meter needle. The needle should be relatively stable on zero.

NOTE: CALIBRATION MUST BE CONDUCTED IN A HYDROCARBON-FREE ATMOSPHERE (CLEAN AIR).

- Attach calibration kit regulator assembly to calibration cylinder, turn calibration cylinder valve knob counter clock-wise (one-half to one turn). DO NOT FORCE THE KNOB ALL THE WAY COUNTER CLOCK-WISE. (OPEN)
- Attach calibration kit outlet connector to the hand-held unit by pushing the connector firmly into the sample inlet quick disconnect on the housing.
- Within 30 seconds the needle should start moving upscale.
- Allow the unit to run at least one-half minute (30 seconds) before checking the meter.

- The meter needle should register within one division of 10 on the instrument scale.
- If an adjustment is necessary to bring the meter within one division of 10 on the scale of 5000 ppm scale, an adjusting control is supplied with the hand held unit located inside the bottom rear of the instrument.
- Adjust control to the proper level. Calibration is complete.
- Repeat the above steps to verify calibration.

5.2.2 Background Readings

Before any field activities commence, the background levels of the site must be read and noted. Daily background readings must be conducted away from areas of potential contamination to obtain accurate results.

5.2.3 Air Monitoring Frequency

All site readings must be noted on the Air Monitoring Record provided in Section 14.0, along with the date, time, background level, weather conditions, wind direction and speed, and the location where the background level was recorded. Per Table 5.1, site readings will be made every 30 minutes during invasive field activities.

6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 General

PPE that will protect employees from the hazards and potential hazards likely to be encountered during site investigations will be selected and used. PPE selection will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site. The level of protection provided will be increased when site conditions deem it necessary to reduce employee exposures to below permissible exposure limits and published exposure levels for hazardous substances.

6.2 Levels of Protection

All field activities will be initiated at Level D. If the action levels specified in Table 5-1 are reached, an upgrade will be made to Level C, as described in Table 6-1.

6.3 Respiratory Protection

If air purifying respirators are required, full facepiece respirators, with combination organic vapor and high efficiency dust and mist cartridges, will be used. Respirators belong to, and are only used and maintained by, the individual to whom they have been issued. **Each NFWWMD and subcontractor employee who anticipates working on-site must be trained, fit tested, and declared medically fit to wear respiratory equipment prior to participating in field activities.**

TABLE 6-1

Protective Equipment for Onsite Activities

<u>Activity</u>	<u>Level</u>	<u>Protective Equipment</u>
	D	<ul style="list-style-type: none"> - Work clothes or coveralls - Safety boots - Safety glasses or goggles - Hard hat <p>Optional:</p> <ul style="list-style-type: none"> - Hearing protection - Tyvek suit
	C	<ul style="list-style-type: none"> - Full facepiece air purifying respirator - Chemical resistant clothing - Inner and outer chemical-resistant gloves - Safety boots - Safety glasses or goggles - Hard Hat <p>Optional:</p> <ul style="list-style-type: none"> - Hearing protection

6.4 Personal Protective Equipment Program

NFWWMD personnel will be participating in various phases of field surveys and may be working with, or in close proximity to, hazardous or toxic environments requiring the use of Personal Protective Equipment (PPE).

The purpose of personal protective clothing and equipment is to shield or isolate individuals from the chemical, physical, and biological hazards that they may encounter at sites of hazardous and toxic materials. The careful selection and use of PPE will protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

Use of PPE is required by the Occupational Safety and Health Administration (OSHA) regulations in 29 CFR Part 1910 and reinforced by the U.S. Environmental Protection Agency (USEPA) regulations, American National Standards Institute (ANSI), U.S. Army Corps of Engineers, and Florida Department of Labor and Employment Security, Division of Safety standards and guidelines.

Equipment to protect the body against known or anticipated hazardous chemicals is divided into four categories according to the degree of protection afforded.

- Level A: Worn when the highest level of respiratory, skin, and eye protection is needed.
- Level B: Worn when the highest level of respiratory protection is needed, but a lesser level of skin protection.
- Level C: Worn when the criteria for using air purifying respirators are met.
- Level D: Worn only as a work uniform and not on a site with respiratory or skin hazards. It provides no protection against chemical hazards.

It is anticipated that work to be conducted at the NTTC Corry Station will fall under Level D category of PPE requirements.

7.0 DECONTAMINATION

7.1 Level D Decontamination Procedures

The maximum level of protection that is expected during site activities is Level D and as such, there are no decontamination stations associated with this level. Any required cleaning of PPE at Level D will be conducted in the contamination reduction zone in the immediate vicinity of the well or boring. All sampling equipment used for collection of soil and water for chemical analysis will be decontaminated in accordance with Section 6.0 of the Quality Assurance Project Plan (Volume II of III). Field decontamination of this equipment will provide for containment and disposal of all wash water, rinse water, and solvents used.

7.2 Level C Decontamination Procedures

1. A decontamination area should be located between the Hot Line (upwind boundary of the Exclusion Zone) and the Support Zone boundary.
2. A personnel decontamination station (PDS) should be established.
3. All personnel should proceed through the appropriate contamination reduction sequence upon leaving the contamination area.
4. All protective gear should be left on-site during any lunch break following decontamination procedures.
5. Material Safety Data Sheets for chemicals used during decontamination procedures should be made available to those who are potentially exposed to these chemicals. These are attached to this health and safety plan. See also Section 12.0 "Hazard Communication" (below).

7.3 Decontamination of Equipment

To the extent possible, measures should be taken to prevent contamination of sampling and monitoring equipment. Sampling devices may become contaminated; however, monitoring instruments, unless they are splashed, usually do not become contaminated. Once contaminated, it is difficult to clean instruments without damaging

them. Any delicate instrument that cannot be decontaminated easily should have a bag taped and secured around it. Openings should be made in the bag for sample intake.

7.3.1 Sampling Devices

Sampling devices require special cleaning. Decontamination of all sampling equipment should be performed in accordance with FDEP approved Comprehensive Quality Assurance Plans.

7.3.2 Tools

Wooden tools are difficult to decontaminate because they absorb chemicals. They should be kept on-site and handled only by protected workers. After use in a contaminated area, wooden tools should be discarded. For decontaminating other tools, refer to quality assurance plans or consult a laboratory.

7.3.3 Respirators

Certain parts of contaminated respirators, such as the harness assembly and cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. Persons responsible for decontaminating respirators should be thoroughly trained in respirator maintenance.

7.3.4 Heavy Equipment

Decontamination of all heavy equipment used will consist of pressure steam cleaning and the use of phosphate-free detergent and potable water. No solvents will be used. The wash water is not expected to pose an immediate threat to human health and the environment, therefore, wash water will be allowed to infiltrate into the ground within the contaminant reduction zone surrounding the well or boring. If containment analysis and disposal of wash water is deemed necessary by the senior field representative, containment will be implemented.

7.3.5 Sanitizing of Personal Protective Equipment

Respirators, reusable protective clothing, and other personal articles not only must be decontaminated before being reused, but also must be sanitized. The inside of masks and clothing becomes soiled because of exhalation, body oils, and perspiration. The manufacturer's instructions should be followed to sanitize the respirator mask. If practical, protective clothing should be machine washed after a thorough decontamination; otherwise, it must be cleaned by hand.

7.3.6 Persistent Contamination

In some instances, clothing and equipment will become contaminated with substances that cannot be removed by normal decontamination procedures. A strong detergent (industrial grade) may be used to remove such contamination from equipment if it does not destroy or degrade the protective material. If persistent contamination is expected, disposable garments should be used. Testing for persistent contamination of protective clothing and appropriate decontamination must be done by qualified laboratory personnel.

7.3.7 Disposal of Contaminated Materials

All materials and equipment used for decontamination must be disposed of properly. Clothing, tools, buckets, brushes, and all other equipment that is contaminated must be secured in drums or other containers and labeled. Clothing not completely decontaminated on-site should be secured in plastic bags before being removed from the site.

Contaminated wash and rinse solutions should be contained by using step-in-containers (e.g., child's wading pool) to hold spent solutions. Another containment method is to dig a trench about 4 inches deep and line it with plastic. In both cases, the spent solutions should be transferred to drums, which should be labeled and disposed of with other substances on-site.

7.4 Minimal Decontamination

Less extensive procedures for decontamination can be subsequently established when disposable clothing and equipment are used, the type and degree of contamination become known, or the potential for transfer is judged to be minimal by the Site Safety Coordinator (SSC) in consultation with the Project Manager.

7.5 Closure of the Personnel Decontamination Station

All disposable clothing and plastic sheeting used during the operation should be double bagged, labeled, and removed to a contractor supplied disposal facility. Cloth items should be bagged and removed from the site for final cleaning. All wash tubs, pails, containers, etc., should be thoroughly washed, rinsed, and dried prior to removal from the site.

8.0 EMPLOYEE TRAINING ASSIGNMENTS

8.1 General

All employees working onsite who are exposed to hazardous substances, health hazards, or safety hazards; their supervisors; and the management responsible for the site must receive training before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances or safety or health hazards. Employees will not be permitted to participate in or supervise field activities until they have been trained to a level required by their job function and responsibility.

8.2 Initial Training

General site workers engaged in hazardous substance removal or other activities that may expose workers to hazardous substances and health hazards will receive a minimum of 40 hours of offsite instruction, and a minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor.

8.3 Management and Supervisor Training

Onsite management and supervisors directly responsible for, or who supervise employees engaged in, hazardous waste operations will receive 40 hours of initial training, 3 days of supervised field experience, and at least 8 additional hours of specialized supervisory training.

8.4 Refresher Training

Employees, managers, and supervisors will receive 8 hours of refresher training annually.

8.5 Additional Training Requirements

The NFWWMD requires employees engaged in field activities be certified in both first aid and cardiopulmonary resuscitation.

9.0 MEDICAL SURVEILLANCE

9.1 General

The following employees who participate in field activities involving hazardous waste will be included in the NFWFMD Medical Surveillance Program:

- All employees who may be exposed to hazardous substances or health hazards at or above the permissible exposure limits, without regard to the use of respirators, for 30 days or more per year.
- All employees who wear a respirator as required by CFR 1910.134.
- All employees who are injured because of overexposure from an incident involving hazardous substances or health hazards.

9.2 Frequency of Medical Exams

Medical examinations and consultations will be made available to the employees discussed above on the following schedules:

- Prior to assignment.
- At least once every 12 months, unless the physician believes a longer interval (not greater than biennially) is appropriate.
- As soon as possible upon notification that the employee has developed signs or symptoms indicating possible overexposure.

9.3 Medical Surveillance Program

This program is an integral part of any Health and Safety Program. The intent of this program is to monitor the health of individual personnel through the use of initial and periodic medical examinations and diagnostic testing. This allows the NFWWMD to:

- Certify individuals to work at NFWWMD sites as required by OSHA regulations.
- Establish a baseline against which any future changes in health or physical well being can be evaluated.
- Identify any underlying illnesses or conditions which might be aggravated by certain exposures or job activities.
- Recognize any abnormalities, toxic reactions, or other changes at the earliest opportunity, so that corrective measures may be taken.

No NFWWMD employees shall participate in site activities in which a potential exposure or injury could occur unless that employee has been cleared by an authorized medical personnel.

10.0 STANDARD OPERATING PROCEDURES

10.1 Organizational Structure and Responsibilities

The health and safety issue is a project management responsibility. Each Project Manager is fully accountable for carrying out assigned work for each project in compliance with the health and safety program.

10.1.1 NWFWMD Project Manager

The Project Manager (PM) shall direct onsite investigations and operational efforts but may delegate all or part of these duties to the Site Manager. The PM:

1. Provides adequate project information to the Agency Safety Coordinator (ASC) so that an appropriate health and safety plan (HSP) can be developed for the project, with sufficient lead time and budget for development of the project HSP.
2. Reviews and approves the HSP.
3. Obtains appropriate monitoring and protective equipment.
4. Monitors safety performance of personnel for compliance with the project HSP.
5. Requires correction of unsafe work practices or conditions.

10.1.2 NWFWMD Site Safety Coordinator

The Site Safety Coordinator's (SSC) duties may be carried out by the PM or other site manager. The SSC:

1. Assures that NFWWMD on-site personnel have read and clearly understand the provisions of this plan prior to on-site activities, including the procedures for handling emergencies and the location and use of first aid equipment.
2. Assures that NFWWMD personnel are aware of the potential hazards associated with site operations.
3. Assures that the personal protective equipment designated in this plan is available and used properly by all NFWWMD on-site personnel.
4. Supervises the safety performance of all NFWWMD personnel to ensure that the required work practices are employed.
5. Prepares accident/incident reports and other forms.
6. Oversees implementation of the project HSP and informs the PM and ASC of any additions or modifications that may be appropriate.
7. Checks with the ASC or his designee to see that assigned personnel have correct Fit for Duty medical authorization.
8. Determines that monitoring equipment is used properly and is calibrated in accordance with manufacturer's instructions or other standards, and that results are properly recorded and filed.
9. Provides on-going review of the protection level needs as project work is performed, and informs the Agency Safety Coordinator and PM of the need to upgrade or downgrade protection levels.
10. Requires correction of unsafe or potentially unsafe working conditions, or stops work in emergencies until such conditions are corrected.
11. Obtains a copy of contractor and subcontractor HSP's.
12. Obtains a copy of the contractor and subcontractor qualifications to work on hazardous waste sites, including:

- a. 40 hour - OSHA Certification
- b. 8 hour - Annual OSHA Refresher Training
- c. Respirator Fit Test Certification
- d. Medical Clearance to Work on Hazardous Waste Sites

10.1.3 NFWWMD Site Personnel

Project personnel involved in onsite investigations and operations are responsible for:

1. Taking reasonable precautions to prevent injury to themselves and to their fellow employees.
2. Performing only those tasks that they believe they can do safely, and immediately reporting any accidents or unsafe conditions to the SSO or PM.
3. Implementing the procedures set forth in the HSP, and reporting any deviations from the procedures described in the plan to the SSO or PM for action.
4. Notifying the PM and SSO of any special medical problems (i.e. allergies) and insuring that onsite personnel are aware of any such problems.

10.2 Reporting of Accidents and Unsafe Conditions

If an accident occurs, the Project Manager and the injured person(s) are to complete a Notice of Injury Form (Form LC-2621-13) for submittal to the Project Director and the ASC, who will forward a copy to the Executive Officer. The ASC should ensure that follow-up action is taken to correct the situation that caused the accident.

The following procedure will be followed by the Project Manager for all recordable occupational accidents and illnesses:

1. Determine whether a case occurs; that is; whether there was a death, illness, or injury;

2. Establish that the case was work related; that is; it resulted from an event or exposure in the work environment;
3. Decide whether the case is an injury or an illness; and
4. If the case is an illness, record it and check the appropriate illness category on the log; or
5. If the case is an injury, decide if it is recordable based on a finding medical treatment, loss of consciousness, restriction of work or motion, or transfer to another job.

Table 10-1 presents this methodology in graphic form.

10.3 Heat Stress

Wearing PPE also puts a worker at a considerable risk of developing heat stress. Table 10-2 describes the signs and symptoms of heat stress. This can result in health effects ranging from heat fatigue to serious illness or death. Consequently, regular monitoring and other precautions are vital.

For workers wearing standard work clothes, recommendations for monitoring and work/rest schedules are those approved by ACGIH and NIOSH. Workers wearing semipermeable PPE or impermeable PPE should be monitored when the temperature in the work area is above 70°F. To monitor the worker, the following should be measured:

- Heart rate--The radial pulse should be counted during a 30-second period as early as possible in the rest period.
 - If the heart rate exceeds 110 beats per minute at the beginning of the rest period, the next work cycle should be shortened by one third and the rest period should be kept the same.
 - If the heart rate still exceeds 110 beats per minute at the next rest period, the following work cycle should be shortened by one third.

- Oral temperature--A clinical thermometer (3 minutes under the tongue) or similar device should be used to measure the oral temperature at the end of the work period (before drinking).
 - If the oral temperature exceeds 99.6°F (37.6 degrees Celsius (°C)), the next work cycle should be shortened by one third, without the rest period being changed.
 - If the oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, the following work cycle should be shortened by one third.
 - A worker should not be permitted to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F (38.1°C).
- Body water loss, if possible--Weight should be measured on a scale accurate to +/- 0.25 pound at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing. The bodywater loss should not exceed 1.5 percent of total body weight loss in a workday.

Initially, the frequency of monitoring depends on ambient temperature (see Table 10-3). The length of the work cycle is determined by the frequency of physiological monitoring described above.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important, because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries. To avoid heat stress, the following steps should be taken:

- Work schedules should be adjusted.
- Shelter (air-conditioned, if possible) or shaded areas should be provided to protect personnel during rest periods.

- Workers' body fluids should be maintained at normal levels to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat--i.e., 8 fluid ounces (0.23 liter) of water must be ingested for approximately every 8 ounces (0.23 kilogram) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, the worker should be encouraged to drink more. The following strategies may be useful:
 - Water temperature should be maintained at 50°F to 60°F (10°C to 15.6°C).
 - Small disposable cups that hold about 4 ounces (0.1 liter) should be provided.

ACCIDENT REPORTING GUIDELINES

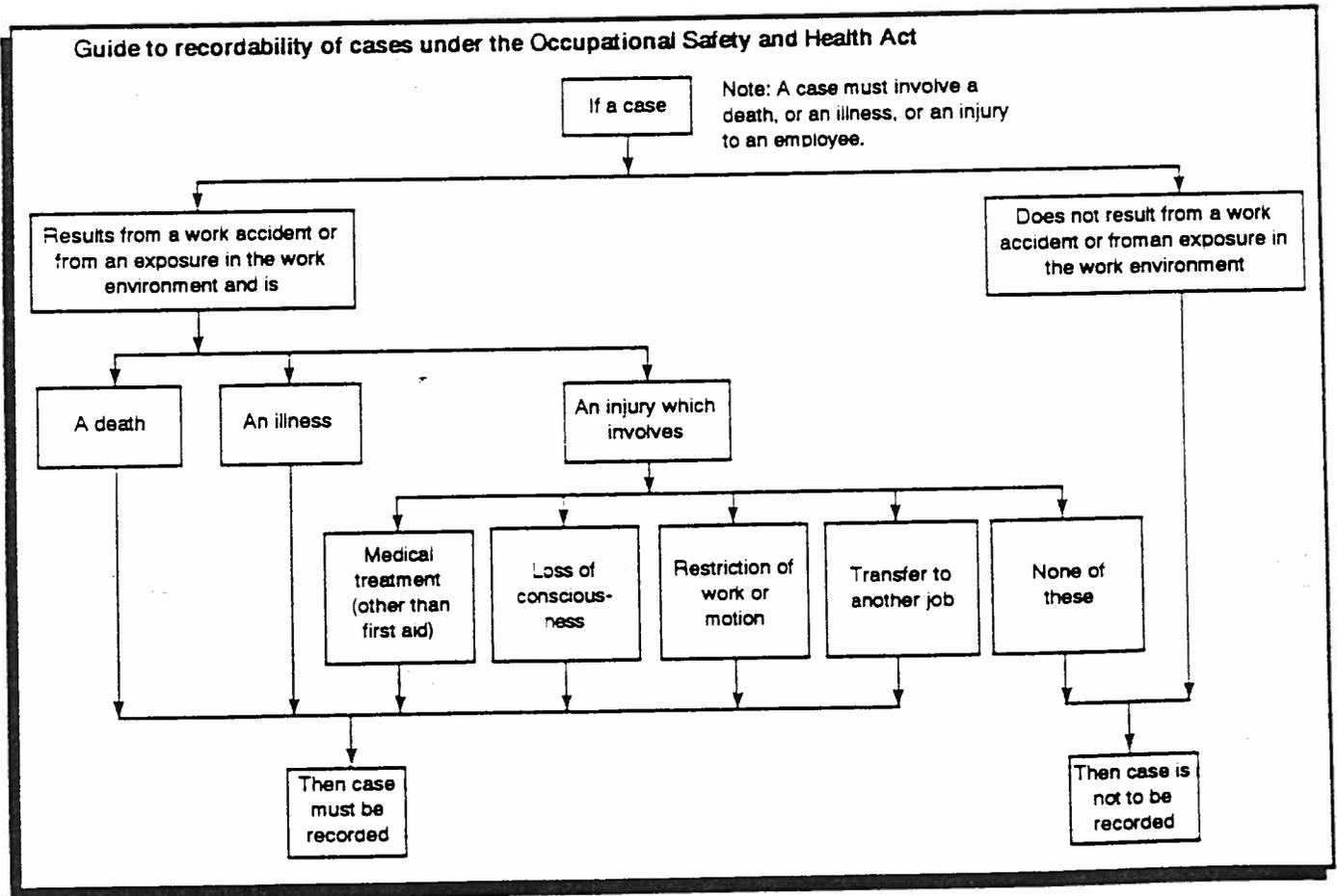
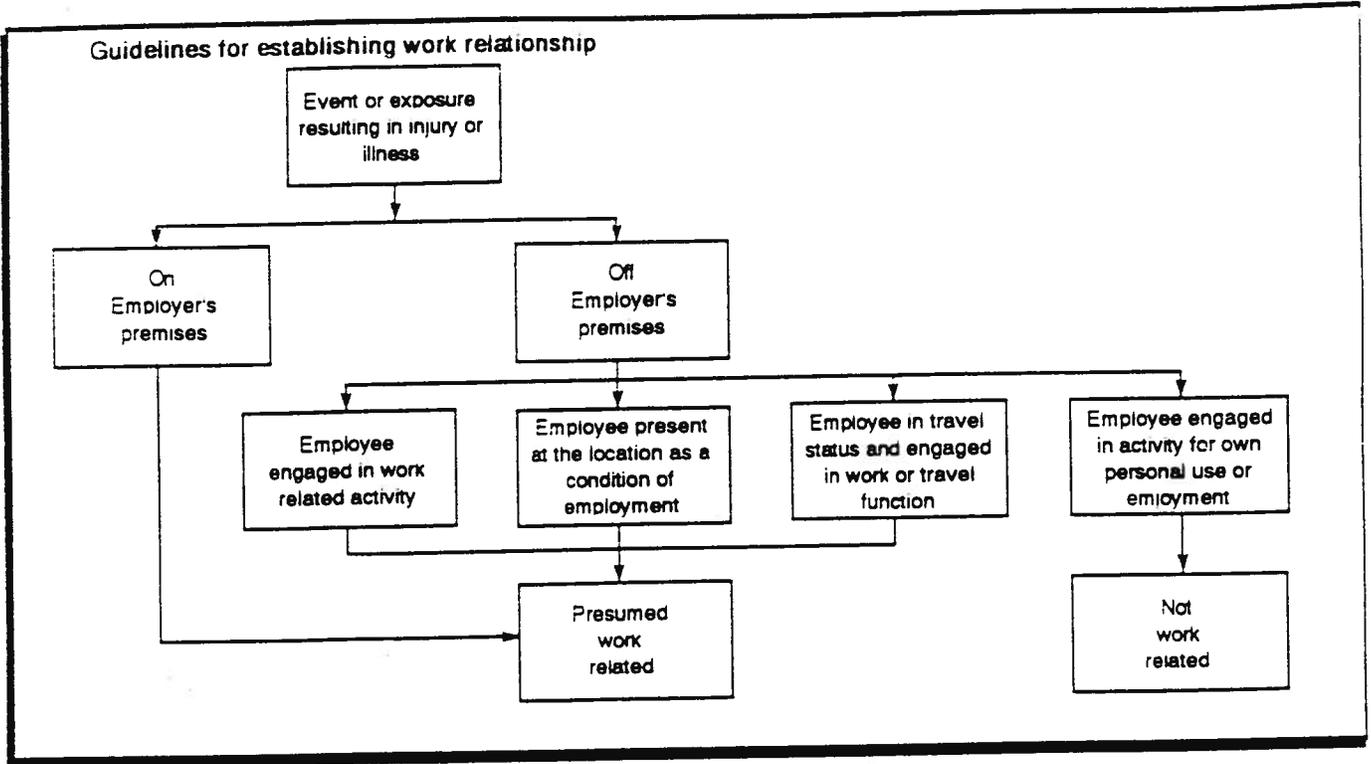


TABLE 10-2

SIGNS AND SYMPTOMS OF HEAT STRESS

Heat rash may result from continuous exposure to heat or humid air.

Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

- Muscle spasms
- Pain in the hands, feet, and abdomen.

Heat exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool, and moist skin
- Heavy sweating
- Dizziness, fainting, and nausea.

Heat stroke is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, and unusually dry skin
- Lack of or reduced perspiration
- Dizziness and confusion
- Strong, rapid pulse, and coma.

Have workers drink 16 ounces (0.5 liter) of fluid (preferably water or diluted drinks) before beginning work. Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight. Weigh workers before and after work to determine if fluid replacement is adequate.

Encourage workers to maintain an optimal level of physical fitness. Where indicated, acclimatize workers to site work conditions.

Provide cooling devices to aid natural body heat exchange during prolonged work or severe heat exposure.

Train workers to recognize, identify, and treat heat stress.

TABLE 10-3

Suggested Frequency of Physiological Monitoring
for Fit and Acclimatized Workers^b

<u>Adjusted Temperature^a</u>	<u>Normal Work Ensemble^c</u>	<u>Impermeable Ensemble</u>
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°-90°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°-30.8°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

^aCalculate the adjusted air temperature (ta adj) by using this equation: $ta\ adj\ ^\circ F = ^\circ F + (13 \times \% \text{ sunshine})$. Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent of the time the sun is not covered by clouds that are thick enough to produce a shadow (100% sunshine = no cloud cover and a sharp, distinct shadow; 0% sunshine = no shadows).

^bFor work levels of 250 kilocalories/hour.

^cA normal work ensemble consists of cotton overalls or other cotton clothing with long sleeves and pants.

10.4 Drilling Safety

10.4.1 Basic Requirements

Employees will not proceed with work on, or in the proximity of, hazardous equipment until they have been properly trained and have received a safety briefing. If drilling is at a hazardous substance site, the site-specific safety plan must be reviewed onsite and discussed in the safety briefing.

Potential hazards (e.g., overhead or underground power lines, oil or gas lines in the immediate vicinity of the drill site) must be removed, avoided by relocating the drill site, or adequately barricaded to eliminate the hazard.

The use of unsafe or defective equipment is not permitted. Equipment must be inspected regularly and, if found to be defective, must be immediately removed from use and either repaired or replaced.

Employees will be familiar with the location of first-aid kits and fire extinguishers. Telephone numbers for emergency assistance must be prominently posted and kept current.

10.4.2 General Requirements at Drilling Operations

10.4.2.1 Housekeeping

Good housekeeping conditions should be observed in and around the work area. Suitable storage places should be provided for all materials and supplies. Pipe, drill rods, etc., must be securely stacked on solid, level sills.

Work surfaces, platforms, stairways, walkways, scaffolding, and accessways will be kept free of obstructions. All debris will be collected and stored in piles or containers for removal and disposal.

10.4.2.2 Flammable Liquids

All highly flammable liquids should be stored and handled only in approved containers. Portable containers must be the approved red safety containers equipped with flame arresters and self-closing lids.

Approved hand pumps will be used to dispense gasoline from barrels. Gasoline must not be used for degreasing or to start fires. Also, gasoline containers should be clearly labeled, and storage areas should be posted with "No Smoking" signs. Fire extinguishers should be installed in all areas that contain flammable liquids.

10.4.2.3 Public Safety

Work areas will be regulated so that the public will be protected from injury or accident. Adequate danger signs, barriers, etc., will be placed to effectively warn the public of hazards as well as to restrict access to dangerous areas.

10.4.3 Off-Road Movement of Drill Rigs

The following rules apply to the off-road movement of drill rigs:

- Before moving a drill rig, an inspection should be made of the route of travel for depressions, slumps, gullies, ruts, and similar obstacles.
- The brakes of a drill rig carrier should always be checked before traveling, particularly on rough, uneven, or hilly ground.
- All passengers should be discharged before a drill rig is moved on rough or hilly terrain.
- The front axle of 4 x 4 or 6 x 6 vehicles or carriers should be engaged when traveling off road on hilly terrain.
- Caution should be used when traveling on a hillside. The hillside capability of drill rigs should be evaluated conservatively, because the addition of

drilling tools may raise the center of mass. When possible, travel should be made directly uphill or downhill.

- Obstacles such as small logs, small erosion channels, or ditches should be crossed squarely, not at an angle.
- When lateral or overhead clearance is close, someone on the ground should be used as a guide.
- After the drill rig has been moved to a new drilling site, all brakes or locks should be set. Wheels should be blocked on steep grades.
- The mast (derrick) of the drill rig should not be in the raised or partially raised position during off-road travel.
- Loads on the drill rig and supporting trucks should be tied down during transport.

10.4.4 Drilling Equipment

10.4.4.1 Skid-Mounted Units

Labels clearly indicating the function and direction of control levers should be posted on the lower unit controls of all drills.

An emergency safety power shutoff device should be installed within reach of the operator on all units. The device should be clearly labeled or otherwise made readily identifiable and checked daily to ensure that it is operable. The power unit should be operated only by authorized and qualified personnel.

Equipment will be shut down during manual lubrication and while repairs or adjustments are being made. Equipment such as internal combustion engines will not be refueled while running. Where practical, the gasoline tank should be positioned or shielded to avoid accidental spillage of fuel on the engine or exhaust manifold during

refueling operations. Hazardous gears and moving parts also should be shielded to prevent accidental contact.

A dry chemical or carbon dioxide fire extinguisher, rated 5 pounds or larger, should be carried on the unit and removed to a position within 25 feet of the worksite during drilling operations. Extinguishers will be inspected and tagged at least once every 3 months.

Engine exhaust systems should be equipped with spark arresters when operated in areas where sparks constitute a fire hazard.

10.4.4.2 Overhead and Underground Utilities

Special precaution must be taken when using a drill rig on a site within the vicinity of electrical power lines and other utilities. Electricity can shock, burn, and cause death.

Overhead and underground utilities should be located, noted, and emphasized on all boring location plans and assignment sheets. When overhead electrical power lines exist at or near a drilling site, all wires should be considered dangerous.

A check should be made for sagging power lines before a site is entered. Power lines should not be lifted to gain entrance. The appropriate utility company should be contacted and a request should be made that it lift or raise and cut off power to the lines.

The area around the drill rig should be inspected before the drill rig mast (derrick) is raised at a site in the vicinity of power lines. The minimum distance from any point on the drill rig to the nearest power line should be determined when the mast is raised or is being raised. The mast should not be raised and the drill rig should not be operated if this distance is less than 20 feet, because hoist lines and overhead power lines can be moved toward each other by the wind.

The existence of underground utilities, such as electric power, gas, petroleum, telephone, sewer, and water lines, should always be suspected. These underground electric lines are as dangerous as overhead lines, so a utility locating service should always be contacted.

There are generally two types of utility locating services. One is a "free" service that is paid for by companies with underground pipes, lines, etc., to protect the public and to prevent costly repairs. However, these services have access only to drawings for primary pipes or lines, typically on public property or right-of-way easements, but not to drawings showing supply or feeder lines from a primary system to the interior of a property. Therefore, they are not required, and in fact hesitate, to locate interior lines. Sites can be cleared for drilling by such services, but without the drill operator's knowledge of the locations of underground feeder or supply lines.

A second type of locating service is provided by a paid subcontractor who physically sweeps or clears interior locations using locating equipment. Locating costs can be minimized by obtaining all available maps, drawings, and employee interview information before contracting with the locating company. This is especially important at large industrial plants or military bases, which can have an intricate network of underground utilities. It is important that every location be cleared, even those for hand-auger borings.

If a sign warning of underground utilities is located on a site boundary, it should not be assumed that underground utilities are located on or near the boundary or property line under the sign; they may be a considerable distance from the sign. The utility company should be contacted to check it out.

The owners of utility lines or the nearest underground utility location service should always be contacted before drilling is started. However, remember that some services provide information on utilities going to, but not within, a site. Metal detectors or other locating equipment may be necessary to determine the presence of shallow (surface) utilities onsite. The utility personnel should mark or flag the location of the underground lines and determine what specific precautions must be taken to ensure safety.

Prior to drilling, the location of the desired hole should be dug to a minimum depth of five feet below land surface. This will ensure the location of any underground utility and telephone lines. This can be accomplished by utilizing a post hole digger or hand auger.

10.4.4.3 Site Selection and Working Platforms

Prior to drilling, adequate site clearing and leveling should be performed to accommodate the drill rig and supplies and to provide a safe working area. Drilling should not commence when tree limbs, unstable ground, or site obstructions result in unsafe tool-handling conditions.

Suitable storage locations should be provided that allow for the convenient handling of tools, materials, and supplies without danger that they could fall and injure anyone. Storing or transporting tools, materials, or supplies within or on the drilling mast (derrick) should be avoided. Pipes, drill rods, bits, casings, augers, and similar drilling tools should be securely stacked in an orderly manner on racks or sills.

Penetration hammers or other types of driving hammers should be placed at a safe location on the ground or secured when unattended on a platform. Work areas, platforms, walkways, scaffolding, and other accessways should be kept free of obstructions and substances such as ice, grease, or oil that could create a hazardous surface. All controls, control linkages, and warning and operation lights and lenses also should be kept free of ice, grease, or oil.

In the vicinity of power transmission or distribution lines, drills should be adequately grounded and set with at least a 15-foot clearance between any part of the drill or mast and the power lines.

Toilet facilities will be convenient to drill crews, or transportation will be readily available to nearby toilet facilities. Toilets will be either the chemical type or constructed over ground pits, which will be backfilled when abandoned. They should be fly tight and maintained in a sanitary condition.

Truck-mounted drills will be equipped with a "safetyline" or with clearly marked and conspicuously located emergency switches. The safetyline emergency stop consists of a taut wire that runs around the back of the machine and connects to a special switch that turns off the power unit when the line is contacted. When emergency switches are used in lieu of a safetyline, there should be a minimum of two switches--one located

within easy reach of the operator, and one located within easy reach of workers at ground level near the drill or auger head. The emergency switches should be tested daily.

Trucks should not be moved backward unless the driver has personally inspected the area behind the truck. In restricted or congested areas, or areas where workmen are located, the assistance of a "spotter" is mandatory. Also, trucks will be equipped with serviceable automatic backup alarms.

Before the mast is raised, personnel will be cleared from the immediate area--with the exception of the operator and a helper, when necessary. A check should be made to ensure safe clearance from energized power lines or equipment. Unsecured equipment must be removed from the mast, and cables, mud lines, and catline ropes must be adequately secured to the mast before raising. After it is raised, the mast must be secured to the rig in an upright position with steel pins.

Drill equipment will not be moved until a thorough inspection has been made to ensure that the mast, drill rods, tools, and other equipment are secured. A check will also be made of the steering mechanism, brakes, lights, load limits, and proper flagging and lighting of load extensions. Applicable traffic laws will be observed when moving drill equipment over public roads.

10.4.5 Surface Drilling Operations

Before the mast of a drill rig is raised and drilling is commenced, the drill rig must first be leveled and stabilized with leveling jacks and/or solid cribbing. The drill rig should be releveled if it settles after the initial setup. The mast should only be lowered when the leveling jacks are down, and the leveling jack pads should not be raised until the mast is completely lowered. Before drilling operations start, the mast should be secured or locked, if required by the drill's manufacturer.

Before the power unit is started, all gears should be disengaged, the cable drum brake should be set, and no rope should be in contact with the cathead.

Before the mast is raised, a check should be made for overhead obstructions. Everyone (with the exception of the operator) should be cleared from the areas immediately to the rear and sides of the mast and informed that the mast is being raised. The drill rig should not be driven from hole to hole with the mast in the raised position.

The drill rig should only be operated from the position of the controls. The operator should shut down the drill engine before leaving the vicinity of the drill. "Horsing around" the vicinity of the drill rig and tool and supply storage areas is strictly prohibited, even when the drill rig is shut down. Caution should be taken when mounting/dismounting the platform.

Drill operations should be terminated during an electrical storm.

The consumption of alcoholic beverages, depressants, stimulants, or any other chemical substance while on the job is strictly prohibited. All unattended boreholes must be adequately covered or protected to prevent people or animals from stepping or falling into the hole. When the drilling project has been completed, all open boreholes should be adequately covered, protected, or backfilled, according to local or state regulations.

A safety chain and cable arrangement should be used to prevent water swivel and mud line whip. All water swivels and hoisting plugs should be checked for possible frozen bearings and should be properly lubricated before use. A frozen bearing could cause mud line whip, which could injure the operator.

Only drill operators should brake or set the chucks to prevent engagement of the transmission prior to removal of the chuck wrench. Also, the chuck jaws should be periodically checked and replaced as necessary.

A string of drill rods should not be braked by the chuck jaws during lowering into the hole. A catline or hoisting cable and plug should be used for braking prior to tightening of the chuck. Failure to follow this procedure could result in steel slivers on the rods, possible hand injuries, and loss of the rods into the hole. Following braking, drill rods should be allowed to drain completely before removal from the working area.

Drill rods will not be lowered into the hole with a pipe wrench. Serious back and hand injuries may result if the rods are lowered by this method.

When using drilling fluids, a rubber or other suitable wiper should be used to remove the material from the drill rods when removing them from the drill hole. When drilling with air, the exhaust and cuttings should be directed away from workers with such devices as diverter heads, the use of which should be stipulated on drilling agreements, where appropriate.

Care must be exercised by the operator to avoid a sudden hoist release of the drill rod while the rod is being carried from the hole. The hoisting capacity and weight of the drill rod must be known to prevent collapse of the mast during drill string removal from the hole. The operating capacity of the mast and hoist also must be known and must not be exceeded.

When tool joints are broken on the ground or on a drilling platform, fingers should be positioned so they will not be caught between the wrench handle and the ground or the platform if the wrench slips or the joint suddenly lets go. Pipe wrench jaws should be checked periodically and replaced as they become worn.

10.4.6 Use of Augers

The use of mismatched auger sections should be avoided. Different brands and different weights should not be used in the same auger flight.

Because some pins lose their temper after very little use, causing the spring or clip section to fail, only tight-fitting pins designed for the auger should be used.

A daily inspection--to include a thorough check of the hydraulic hoses, connections, and valves--will be made before equipment is used. Deficiencies should be corrected or safe condition verified before the equipment is started.

A durable sign containing the following wording should be installed on all equipment in full view of the operator:

- All personnel must be clear before starting this machine
- Stop the auger to clean it
- Stop engine when repairing, lubricating, or refueling
- Do not wear loose-fitting clothing or gauntlet-type gloves.

The following general procedures should be used when advancing a boring with continuous flight or hollow stem augers:

- An auger boring should be started with the drill rig level, the clutch or hydraulic rotation control disengaged, the transmission in low gear, and the engine running at low revolutions per minute (rpm).
- A system of responsibility should be established for the series of activities required for auger drilling, such as connecting or disconnecting auger sections and inserting or removing the auger fork. The operator must be sure that the tool handler is well away from the auger column and that the auger fork has been removed before rotation is started.
- Only the manufacturer's recommended method of securing the auger to the power coupling should be used. The coupling or the auger should not be touched with the hands, a wrench, or any other tool during rotation.
- Tool hoists should be used to handle auger sections whenever possible. Hands or fingers should never be placed under the bottom of an auger section when the auger is being hoisted over the top of the auger section in the ground or other hard surface, such as the drill rig platform. Feet should never be allowed to get under the auger section that is being hoisted.
- Workers should stay clear of the auger and other rotating components of the drill rig. Workers should never reach behind or around a rotating auger for any reason.

- Hands or feet should never be used to remove cuttings from the auger.
- Augers should be cleaned only when the drill rig is in neutral and the augers have stopped rotating. A special paddle should be designed for cleaning auger flights; if available, pressurized water is recommended for jet cleaning.

10.4.7 Use of Handtools and Portable Power Tools

Handtools should be kept in good repair and used only for their designed purposes. Proper protective eyewear should be worn when using handtools and portable power tools. Unguarded sharp-edged or pointed tools will not be carried in employees' pockets.

The use of tools with mushroomed heads, split or defective handles, worn parts, or other defects will not be permitted. Tools that have become unsafe will be reconditioned before reissue or discarded.

Throwing or dropping of tools from one level to another will not be permitted; rather, containers and hand lines should be used for transporting tools from one level to another.

Nonsparking tools will be used in atmospheres where sources of ignition may cause fire or explosion.

Electric-powered shop and hand tools will be of the double-insulated, shock-proof type or be effectively grounded. Power tools should be operated only by designated employees who are familiar with their use.

Portable grinding tools will not be used without properly installed safety guards. Guards and tool rests should be maintained in proper adjustment. Grinding wheels should not be operated at speeds in excess of the manufacturer's safe ratings. Cracked or defective wheels will not be used.

Portable circular saws should be equipped with guards that automatically enclose the cutting edges. Cracked or defective blades will not be used. Also, power saws will not be left running when unattended.

Portable pneumatic tools should be inspected periodically to ensure good mechanical condition. Pneumatic impact tools will be operated with safety clips or retainers installed to prevent the tools from accidentally being discharged from the chuck. Airhoses should not be disconnected from equipment until the pressure has been shut off and exhausted from the line. Safety lashing will be provided at all hose and tool connections on air lines over 0.5 inch in diameter. Leaking or defective hoses should be replaced.

When not in use, tools will not be left on scaffolds, ladders, or overhead working spaces. Containers should be provided to hold tools and prevent them from falling.

10.4.8 Use of Ropes, Chains, and Accessories

The use of ropes and chains will be governed by the instructions on usage and safety limits as recommended by the manufacturer. Ropes and chains should be inspected before use, and their loading should not exceed the manufacturer's safety limits.

Hooks used in hoisting personnel or in hoisting loads over or in the immediate vicinity of workers should be made of forged steel and equipped with safety keepers. When shackles are used under these conditions, they should be of the locking type or the pin should be secured to prohibit turning.

Load-lifting accessories, such as sheaves, shackles, hooks, headache balls, etc., should be obtained from a reputable manufacturer. The use of job-fabricated lifting accessories is expressly prohibited. Load-lifting accessories that show excessive wear or have been bent, twisted, or otherwise damaged will be removed from service.

10.4.8.1 Slings

When in use, slings should be inspected daily for signs of overloading, excessive wear, or damage. Defective slings should be removed from service and repaired or replaced before reuse.

Proper storage should be provided for slings to prevent any damage that would impair their strength. They should be protected from sharp, rough, or square corners to prevent cutting or breaking of fibers, strands, or chain links.

10.4.8.2 Wire Rope

The safe performance of wire rope or cables can be ensured by rigid periodic inspection and by proper use and care.

The maximum allowable load for wire hoisting rope must not exceed the safe working load prescribed by the manufacturer or the ultimate strength of the rope divided by the safety factor. Commercial end-fastenings, clips, and zinc sockets must be properly applied to develop maximum strength. Wire rope should be removed from hoisting or load-carrying service when kinked or when any one of the following conditions is observed:

- The existence of 12 randomly distributed broken wires in one rope lay, or four broken wires in a single strand in one rope lay.
- Evidence of corrosion or heat damage.
- One broken wire, rust, or corrosion adjacent to a socket or end-fitting (this requires removal from service or resocketing).
- Distortion, stretching, elongation, or abnormal reduction in diameter.

Wire rope found to be defective for hoisting or load-carrying should be plainly marked as being unfit for such use.

Running lines of hoisting equipment located within 8 feet of the ground or working level will be guarded; or access to the operating area can be restricted.

Rope clips attached with U-bolts should have the U-bolts on the dead end of the rope. When a wedge-socket fastening is used, the dead or short end of the cable should be clipped to the live cable with a U-bolt or another approved fastener.

10.4.8.3 Fiber and Synthetic-Fiber Rope

In selecting fiber and synthetic-fiber ropes for load-carrying purposes, only the best quality rope should be used, with size and application in accordance with the manufacturer's recommendations. These ropes should be inspected frequently to ensure safe performance.

Proper care must be given to ropes to maintain good condition and high strength capacity. Fiber ropes should not be allowed to freeze after becoming wet, but should be cleaned carefully and dried in loose coils. Ropes should not be stored close to cement, lime, acids, or alkalis. Ropes that have been exposed to these materials should be removed from service.

10.4.8.4 Chains

Extreme care is necessary in the use and maintenance of all load-carrying chains. They should be inspected by a competent person after each installation and regularly thereafter. Chains must not be subjected to a load greater than their rated safe loading, which is determined from capacity tables issued by the chain manufacturer.

Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or by passing one link through another and inserting a bolt or a nail to hold it, is prohibited.

10.4.8.5 Hoists

If a ball-bearing type hoisting swivel is used to hoist drill rods, swivel bearings should be inspected and lubricated on a daily basis to ensure that the swivel freely rotates under load. If a rod-slipping device is used to hoist drill rods, the drill rods should not

be drilled or rotated through the slipping device. No more than 1 foot (0.3 meter) of the drill rod column should be hoisted above the top of the mast (derrick). A rod column with loose tool joints should not be hoisted while the rod column is being supported by a slipping device. If drill rods slip back into the borehole, an attempt should not be made to brake the fall of the rods with your hands.

Most sheaves on drill rigs are stationary, with a single-part line. The manufacturer of the drill rig should be consulted before the number of line parts is increased. Wire ropes must be properly matched with each sheave.

Tool handling hoists should only be used for vertical lifting of tools (except when angle hole drilling). Tool handling hoists should not be used to pull on objects away from the drill rig; however, drills may be moved by using the main hoist as the wire rope is spooled through proper sheaves, according to the manufacturer's recommendations.

When tools or similar loads cannot be raised with a hoist, the hoist line should be disconnected and the tools connected directly to the feed mechanism of the drill. Hydraulic leveling jacks should not be used for added pull to the hoist line or the feed mechanism of the drill.

When attempting to pull out a mired vehicle or drill rig carrier, only a winch on the front or rear of the vehicle or drill rig carrier should be used and workers should stay as far away as possible from the wire rope. Tool hoists should not be used to pull out a mired vehicle or a drill rig carrier. The following rules also apply:

- The shock loading of a wire rope can be minimized by smooth and steady application of loads.
- Wire rope should be protected from sharp corners or edges.
- Clutches and brakes of hoists should be periodically inspected and tested.
- Gloves should always be worn when handling wire ropes.
- Following the installation of a new wire rope, a light load should be lifted first to allow the wire rope to adjust.

- A load should never be hoisted over someone's head, body, or feet, or left suspended in the air when the hoist is unattended.
- Hands should be kept away from hoists, wire rope, hoisting hooks, sheaves, and pinch point when the slack is being taken up, and when the load is being hoisted. Hands should not be used to guide wire ropes on hoist drums.

11.0 EMERGENCY RESPONSE PLAN

This section describes contingencies and emergency planning procedures to be implemented at the site. This Emergency Response Plan is compatible with local, state, and Federal disaster and emergency management plans, as appropriate. The list of appropriate emergency contacts is found in Section 3.5 of this plan.

11.1 Pre-Emergency Planning

An emergency evacuation route(s) will be chosen immediately upon arrival at the site. During the periodic site briefings, all workers will be trained in provisions of the Emergency Response Plan, communication systems, and evacuation routes. The plan will be reviewed and revised, if necessary, on a regular basis by the ASC to ensure that the plan is adequate and consistent with prevailing site conditions.

11.2 Personnel Roles and Lines of Authority

The site supervisor has primary responsibility for responding to and correcting emergency situations. This includes taking appropriate measures to ensure the safety of site personnel and the public, such as evacuation of personnel and adjacent residents from the site area. The site supervisor must also ensure that corrective measures have been implemented, appropriate authorities have been notified, and follow-up reports have been completed. The ASC may be called upon to act on behalf of the site supervisor and will direct responses to any medical emergency.

The individual contractor organizations are responsible for assisting the Project Manager's mission within the parameters of their scope of work.

11.3 Emergency Recognition

Tables 3-1 and 3-2 above provide listings of chemical and physical hazards onsite. Personnel should be familiar with techniques of hazard recognition from pre-assignment training and site-specific briefings. The ASC should ensure that the proper prevention devices or equipment are available to personnel.

In an emergency, personnel should proceed to the closest exit with their buddies and mobilize to the safe distance area associated with the evacuation route. Three horn blasts denote an emergency situation requiring evacuation. Personnel should remain in the safe distance area until further instructions are provided by an authorized individual, either via personal communication or via a cellular telephone.

11.4 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the Exclusion Zone 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 (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must be reported immediately to the Project Manager.

Personnel who are transported to a clinic or hospital for treatment should take with them information on the chemical(s) they have been exposed to at the site. This information is included in Table 3-1.

Any vehicle used to transport contaminated personnel will be treated and cleaned, as necessary.

11.5 Fire or Explosion

In the event of a fire or explosion, the local fire department should be notified immediately. The Site Safety Coordinator or a designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials onsite.

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

- Use fire fighting equipment available onsite to control or extinguish the fire.
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

11.6 Spills or Leaks

In the event of a spill or a leak, site personnel will:

- Inform their supervisor immediately.
- Locate the source of the spillage and stop the flow if it can be done safely.
- Begin containment and recovery of the spilled materials.

11.7 Emergency Information

11.7.1 Emergency Contacts

<u>Contact</u>	<u>Person or Agency</u>	<u>Telephone No.</u>
Security	Corry Security	904/452-6119
Fire	NAS Pensacola Fire Department	904/452-3333
Ambulance	Escambia County	911

Hospital	Baptist Hospital	904/434-4011
Poison Control	Baptist Hospital	904/434-4011
Client Contact	Ron Joyner - PWC Facilities - E n v i r o n m e n t a l Coordinator	904/452-4515
NFWFMD Project Manager	Thomas Pratt, P.G.	904/539-5999
NFWFMD Project Director	Christopher Howell, Ph.D.	904/539-5999
Agency Safety Coordinator	Kim Dupree-Wiggins	904/539-5999

11.7.2 Location of Site Resources

Water Supply: NTTC Building - As designated by PWC Utilities Department

Telephone: NTTC Corry Building 517, Corry Station Base Civil Engineers Office

11.7.3 Location of Hospital/Clinic

The hospital to be utilized, if needed, is the Baptist Hospital located on "A" Street, Pensacola, Florida. The route map to the hospital is presented in Figure 11-1 and a description of the route to the hospital is:

- Leave the east gate of Corry Station;
- Turn left (north) onto New Warrington Road/S.R. 295 and proceed north, approximately three miles, on New Warrington Road to Fairfield Drive/also S.R. 295;
- Turn right (east) onto Fairfield Drive and proceed east, approximately three miles, to the turn-off for Texar Drive;
- Continue straight onto Texar Drive until the intersection with E Street/C.R. 443
- Turn right, onto E Street, and proceed south, approximately one mile, to the hospital's emergency room entrance.



PROJECT: PHASE II SOIL AND/OR GROUND WATER CONTAMINATION INVESTIGATION AND MODELING FOR THE NTT
 LOCATION: CORRY STATION, PENSACOLA, FLORIDA
 DATE: OCTOBER 29, 1993

EMERGENCY ROUTE TO HOSPITAL

FIGURE 11-1

12.0 HAZARD COMMUNICATION

12.1 General

The NFWWMD Hazard Communication Program complies with the OSHA Hazard Communication Standard (HCS) found in 29 CFR 1910.1200 and 29 CFR 1926.59, which applies to any chemical present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency. Although waste materials are excluded from the OSHA requirement, decontamination chemicals for sampling apparatus or protective clothing (such as acetone or trisodium phosphate) and calibration standards (such as isobutylene gas) require Material Safety Data Sheets (MSDS).

The principle of communicating the hazards of materials used in the workplace to employees applies broadly to districtwide activities, from informational programs on the conduct of hazardous waste activities to the district's insistence upon adequate safety and health training. It is also important for personnel to have an awareness of client concern for Hazard Communication due to Federal, state, and local regulations directly affecting certain client activities.

12.2 Compliance Requirements

In order to comply with Hazard Communication Standard (29 CFR 1910.1200), the NFWWMD has determined that:

- All containers of hazardous chemicals must be appropriately labeled or tagged to identify the hazard and provide information on effects and appropriate protective measures.
- Labels, tags, or signs must be properly affixed and visible at all times while a hazard is present and removed promptly when the hazard no longer exists.

- Written information (MSDS) on hazardous chemicals in the workplace must be available to employees working with the substance.
- Appropriate MSDS will be available to any contractor or subcontractor employees working in NFWWMD offices or laboratories or at construction, excavation, or other sites under the NFWWMD's control.
- Hazard Communication Training should be provided to NFWWMD employees.

Any MSDS sheets required for this project are attached to this health and safety plan in Section 15.0.

13.0 POSTING OF NOTICE

Under provisions of Title 29, CFR Part 1903.2(a)(1), employers must post a notice, furnished by OSHA, informing employees of the protection and obligations provided for in OSHA Act of 1970. Full-sized federal forms will be used.

Where a site office is established, this notice will be posted in a conspicuous place or places where notices to employees are customarily posted. When working out of the cab of a vehicle, such notice is not required.

14.0 FORMS

The following forms will be provided to the SSC during final preparations for departure to the job site:

- Federal Safety Poster
- Daily Instrument Calibration Checksheet
- Air Monitoring Data Sheet
- Plan Acceptance Form
- Plan Feedback Form
- Notice of Injury Form (Form LC-3621-13)
- Site Safety Briefing Form.

The Plan Acceptance Form will be filled out by all employees working on the site. The Plan Feedback Form will be filled out by the SSC and any other onsite employee who wishes to fill one out. The Accident Report Form will be filled out by the Project Manager if an accident occurs. The Site Safety Briefing Form will be filled out by the SSC and signed by all persons who received the site safety briefing.

**ALL COMPLETED FORMS SHOULD BE RETURNED TO THE OFFICE
ASC FOR RETENTION IN PROJECT FILES.**

AIR MONITORING DATA SHEET

SAMPLED BY: _____
 DATE: _____
 INSTRUMENT USED: _____

PROJECT NAME: _____
 PROJECT NUMBER: _____
 CALIBRATION DATE: _____

ESTIMATED WIND DIRECTION: ___ N ___ S ___ W ___ E ___ NE ___ NW ___ SE ___ SW

ESTIMATED WIND SPEED: ___ CALM ___ MODERATE ___ STRONG

FIELD ACTIVITIES: _____

BACKGROUND LEVEL: _____ LOCATION: _____

Sample Number	Time	Duration (minutes)	Location	Reading (PPM)	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

PLAN FEEDBACK FORM
(OPTIONAL)

PROJECT NUMBER: _____
PROJECT NAME: _____
DATE: _____

Problems with plan requirements:

Unexpected situations encountered:

Recommendations for future revisions:

SITE SAFETY BRIEFINGS

JOB NAME _____ NUMBER _____
DATE _____ START TIME _____ COMPLETED _____
SITE LOCATION _____
TYPE OF WORK (GENERAL) _____

SAFETY ISSUES

Tasks _____

Protective Clothing/Equipment _____

Chemical Hazards _____

Physical Hazards _____

Control Methods _____

Special Equipment/Techniques _____

Nearest Phone _____

Hospital Name/Address _____

Special Topics (incidents, actions taken, etc.) _____

ATTENDEES

Print Name

Sign Name

Meeting Conducted By: _____

**Subcontractor
Health and Safety Plan Acceptance Form**

This is to confirm that the employees listed below are familiar with Northwest Florida Water Management District's Site-Specific Health and Safety Plan for the Phase II Soil and/or Ground Water Contamination Investigation and Modeling for the Naval Technical Training Center (NTTC) at Corry Station, Pensacola, Florida. Further, all said employees are familiar with the site-specific health and safety plan provided by the subcontractor.

Employee Names

- | | |
|-----------|-----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |
| 5. _____ | 6. _____ |
| 7. _____ | 8. _____ |
| 9. _____ | 10. _____ |
| 11. _____ | 12. _____ |
| 13. _____ | 14. _____ |

Authorized Subcontractor Representative

Printed Name

15.0 MATERIAL SAFETY DATA SHEETS

DATE 5/26/92

MATERIAL SAFETY DATA SHEET

PAGE 1

SECTION I - GENERAL INFORMATION
(REORDER PRODUCT BY THIS NO.)

CATALOG NO 48503
PRODUCT NAME BENZENE
MSDS SHEET NO R495070
BENZENE

CHEMICAL NAME BENZENE

FORMULA C6H6

FORMULA WEIGHT 78

CAS 71-43-2 RTECS CY1400000

CLASSIFIED BY IARC AS A CLASS 1 CARCINOGEN.

OSHA REGULATED CARCINOGEN, 29 CFR 1910.

SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313.

CLASSIFIED BY NTP AS A GROUP A CARCINOGEN.

SYNONYM BENZOLE

MANUFACTURER SUPELCO INC.

PHONE 814-359-3441

ADDRESS SUPELCO PARK, BELLEFONTE, PA 16823-0048

SECTION II - HAZARDOUS INGREDIENTS OF MIXTURES

CHEMICAL NAME
COMMON NAME - PERCENTAGE - CAS #
(FORMULA) - PEL(UNITS) - TLV(UNITS)
LD50 VALUE - CONDITIONS

N/A

SECTION III - PHYSICAL DATA

BOILING POINT 80.1 C MM MELTING POINT 5 C
VAPOR PRESSURE 75 MM C VAPOR DENSITY N/A
SPECIFIC GRAVITY .879 G/ML 20.0 C (WATER=1) PERCENT VOLATILE BY VOLUME 100
SOLUBILITY .18 EVAPORATION RATE N/A
APPEARANCE CLEAR COLORLESS LIQUID
ODOR GASOLINE ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 12 F CLOSED CUP FLAMMABLE LIMITS LEL 1.3 UEL 8.0

EXTINGUISHING MEDIA

CO2
FOAM
DRY CHEMICAL
WATER MAY BE INEFFECTIVE.

SPECIAL FIRE FIGHTING PROCEDURES

WEAR SELF CONTAINED BREATHING APPARATUS WHEN FIGHTING A CHEMICAL FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS

VAPORS FORM EXPLOSIVE MIXTURES WITH AIR.
MAY REACT WITH OXIDIZING MATERIALS.
CONTAINERS MAY EXPLODE UNDER FIRE CONDITIONS.

DATE 5/26/92

MATERIAL SAFETY DATA SHEET

PAGE 2

CATALOG NO 48503 (REORDER PRODUCT BY THIS NO.)
PRODUCT NAME BENZENE
DATA SHEET NO R495070
BENZENE

CONTINUED *

FLASHBACK ALONG VAPOR TRAIL MAY OCCUR.

SECTION V - HEALTH HAZARD DATA

LD50 4894 MG/KG ORAL RAT TLV 10 PPM
PEL 1 PPM

EMERGENCY AND FIRST AID PROCEDURES

EYES

FLUSH EYES WITH WATER FOR 15 MINUTES.

SKIN

PROMPTLY WASH SKIN WITH MILD SOAP AND LARGE VOLUMES OF WATER.
REMOVE CONTAMINATED CLOTHING.

INHALATION

IMMEDIATELY MOVE TO FRESH AIR.
GIVE OXYGEN IF BREATHING IS LABORED
IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION
CONTACT A PHYSICIAN

INGESTION

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON
NEVER TRY TO MAKE AN UNCONSCIOUS PERSON VOMIT
DO NOT INDUCE VOMITING.
GIVE LARGE AMOUNTS OF WATER
GIVE LARGE AMOUNTS OF MILK

EFFECTS OF OVEREXPOSURE

MAY IRRITATE EYES AND/OR SKIN
IRRITATES RESPIRATORY TRACT
MAY BE FATAL IF INHALED
HARMFUL IF INHALED
HARMFUL IF SWALLOWED
CONTAINS MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER.
DERMATITIS
BREATHING DIFFICULTY
PULMONARY EDEMA
HEADACHE
BLURRED VISION
DIZZINESS
GASTROINTESTINAL DISTURBANCES
DEPRESSES CENTRAL NERVOUS SYSTEM
REPORTED HUMAN CARCINOGEN.
CARCINOGENICITY - INDEFINITE IN ANIMALS.
LEUKEMIA

DATE 5/26/92

MATERIAL SAFETY DATA SHEET

PAGE 3

CATALOG NO 48503

(REORDER PRODUCT BY THIS NO.)

PRODUCT NAME BENZENE

MSDS SHEET NO R495070

BENZENE

SECTION V - HEALTH HAZARD DATA

* CONTINUED *

REVERSIBLE CORNEAL EFFECTS MAY OCCUR.

SECTION VI - REACTIVITY DATA

STABILITY STABLE.

CONDITIONS TO AVOID

N/A

INCOMPATIBILITY

STRONG ACIDS

OXIDIZING AGENTS

FLUORINE, CHLORINE AND BROMINE.

HAZARDOUS DECOMPOSITION PRODUCTS

N/A

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO AVOID

N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

TAKE UP WITH ABSORBENT MATERIAL.

VENTILATE AREA.

ELIMINATE ALL IGNITION SOURCES.

WASTE DISPOSAL METHOD

COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL REGULATIONS

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFIC TYPE)

WEAR FACE MASK WITH ORGANIC VAPOR CANISTER.

DATE 5/26/92

MATERIAL SAFETY DATA SHEET

PAGE 4

CATALOG NO 48503

(REORDER PRODUCT BY THIS NO.)

PRODUCT NAME BENZENE

DATA SHEET NO R495070

BENZENE

SECTION VIII - SPECIAL PROTECTION INFORMATION

* CONTINUED *

PROTECTIVE GLOVES

WEAR PLASTIC GLOVES.

EYE PROTECTION

WEAR PROTECTIVE GLASSES.

VENTILATION

USE ONLY IN EXHAUST HOOD.

SPECIAL

N/A

OTHER PROTECTIVE EQUIPMENT

N/A

SECTION IX - SPECIAL PRECAUTIONS

STORAGE AND HANDLING

STORE IN SEALED CONTAINER IN COOL, DRY LOCATION.

KEEP AWAY FROM HEAT.

KEEP AWAY FROM OXIDIZERS.

KEEP AWAY FROM IGNITION SOURCES.

OTHER PRECAUTIONS

REPORTED CANCER HAZARD.

AVOID EYE OR SKIN CONTACT.

AVOID BREATHING VAPORS.

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, SUPELCO, INC. MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

LAST REVISED 2/13/92

MATERIAL SAFETY DATA SHEET

INVOICE#: CS97617

05/76/92

FDH: 26-A7145-88/T11613

LAST REVISED: December 1, 1998

SECTION I PRODUCT SPECIFICATIONS

Hexachloro-epoxy-octahydro-endo-exo-dimethanonaphthalene

OTHER NAME: Dieldrin

Lot No. PB-76

Lot No. 60-57-1

Supplied by CHEM SERVICE, Inc. PO BOX 3100, WEST CHESTER, PA, 19381 (215)692-3026

EMERGENCY PHONE #: 215-692-3026

SECTION II TOXICITY DATA

ORAL RAT OR MOUSE LD50	RTECS#	OSHA PEL (TWA)	ACGIH TLV (TWA)
46mg/kg	101750000	.25 mg/m3	.25mg/m3

This compound is considered to be highly toxic.
This statement is based upon OSHA's assesment of the LD50

CARCINOGENICITY: OSHA: (NO) IARC: (NO) NTP: (NO) ACGIH: (NO) NIOSH: (YES) OTHER: (NO)

SECTION III PHYSICAL DATA

MELTING POINT	BOILING POINT	DENSITY	VAPOR PRESSURE	VAPOR DENSITY	EVAPORATION RATE (Butyl acetate)
175-177 C	dec C	1.75	3.1E-6mm@2 C	NOT AVAILABLE	NOT AVAILABLE
ODOR	COLOR	PHASE		SOLUBILITY IN WATER	
Fungent, acrid	Colorless to light t	Crystalline solid		Insoluble (immiscible)	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: DATA NOT AVAILABLE

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical powder or spray.
No explosion limits are available for this compound.

SECTION V HEALTH HAZARD DATA

Contact lenses should not be worn in the laboratory.
All chemicals should be considered hazardous - Avoid direct physical contact!
May be fatal if absorbed through the skin! May be fatal if inhaled! May be fatal if swallowed!
Exposure can cause liver damage. Exposure can cause kidney damage.
Can cause nervous system injury. Can cause eye irritation. Can cause skin irritation.
Dust and/or vapors can cause irritation to respiratory tract.
Can be irritating to mucous membranes.

SECTION VI FIRST AID

An antidote is a substance intended to counteract the effect of a poison. It should be administered by a physician or a trained emergency personnel. Medical advice can be obtained from a POISON CONTROL CENTER.

In case of contact: Flush eyes continuously with water for 15-20 minutes. Flush skin with water for 15-20 minutes. If no burns have occurred-use soap and water to cleanse skin.
 If inhaled remove patient to fresh air. Administer oxygen if patient is having difficulty breathing. If patient has stopped breathing administer artificial respirations.
 If patient is in cardiac arrest administer CPR.
 Continue life supporting measures until medical assistance has arrived.
 Remove and wash contaminated clothing.
 If patient is exhibiting signs of shock - Keep warm and quiet.
 Contact Poison Control Center immediately if necessary. Induce vomiting if swallowed.
 Do not administer liquids or induce vomiting to an unconscious or convulsing person.
 If patient is vomiting-watch closely to make sure airway does not become obstructed by vomit.
 Get medical attention if necessary.

SECTION VII REACTIVITY DATA

Incompatible with strong oxidizing agents. Incompatible with strong acids.
 Reacts with alcohols. Incompatible with active metals (e.g. Sodium).

SECTION VIII SPILL OR LEAK PROCEDURES

Spills or leaks: Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Sweep up and place in an appropriate container. Hold for disposal.
 Wash contaminated surfaces to remove any residues.
 Disposal: Burn in a chemical incinerator equipped with an afterburner and scrubber.

SECTION IX PRECAUTIONS TO BE TAKEN IN HANDLING

This chemical should be handled only in a hood. Eye shields should be worn. Use appropriate OSHA/MSHA approved safety equipment. Avoid contact with skin, eyes and clothing. Keep tightly closed in a cool dry place. Store only with compatible chemicals.

SECTION X SPECIAL PRECAUTIONS AND COMMENTS

The above information is believed to be correct on the date it is published and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded MSDS must be made available to the employee within three months. Responsibility for updates lies with the employer and not with CHEM SERVICE, Inc. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.

ALL RIGHTS RESERVED
 CUSTOMER P.O. NO. T15576

TWX 510-670-3600

DATE 5/10/93

MATERIAL SAFETY DATA SHEET

PAGE 1

SECTION I - GENERAL INFORMATION

(REORDER PRODUCT BY THIS NO.)

CATALOG NO 40083
 PRODUCT NAME TETRACHLOROETHYLENE 5000UG/ML, 1ML
 DATA SHEET NO 1400830

TETRACHLOROETHYLENE

FORMULA MIXTURE FORMULA WEIGHT
 CAS NRTECS
 SYNONYM ANALYTICAL STANDARD IN METHANOL
 MANUFACTURER SUPELCO INC. PHONE 814-359-3441
 ADDRESS SUPELCO PARK, BELLEFONTE, PA 16823-0048

SECTION II - HAZARDOUS INGREDIENTS OF MIXTURES

CHEMICAL NAME

COMMON NAME - PERCENTAGE - CAS #
 (FORMULA) - PEL(UNITS) - TLV(UNITS)
 LD50 VALUE - CONDITIONS

ETHENE, TETRACHLORO- TETRACHLOROETHYLENE C2Cl4		0.5		127-18-4
8100	MG/KG	25	PPM 50	PPM
	ORAL RAT	SEE FOOTNOTE(3,6)		
METHANOL METHANOL CH3OH		99-100		67-56-1
5628	MG/KG	260	MG/M3 262	MG/M3
	ORAL RAT	SEE FOOTNOTE(6)		

FOOTNOTES

- 3 CLASSIFIED BY IARC AS A CLASS 2B CARCINOGEN.
- 6 SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313.

SECTION III - PHYSICAL DATA

BOILING POINT 65 C MM MELTING POINT -98 C
 VAPOR PRESSURE 100 MM C VAPOR DENSITY 1.10 C (AIR=1)
 SPECIFIC GRAVITY .790 G/ML C (WATER=1) PERCENT VOLATILE BY VOLUME 100
 WATER SOLUBILITY 100 EVAPORATION RATE >1 (ETHER=1)
 APPEARANCE CLEAR COLORLESS LIQUID

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 50 F FLAMMABLE LIMITS LEL 6.0 UEL 36.5

EXTINGUISHING MEDIA

CO2
 DRY CHEMICAL
 ALCOHOL FOAM.

SPECIAL FIRE FIGHTING PROCEDURES

WEAR SELF CONTAINED BREATHING APPARATUS WHEN FIGHTING A CHEMICAL FIRE.

UNUSUAL FIRE AND EXPLOSION HAZARDS

THE FOLLOWING TOXIC VAPORS ARE FORMED WHEN THIS MATERIAL IS HEATED TO DECOMPOSITION.

DATE 5/10/93

MATERIAL SAFETY DATA SHEET

PAGE 2

CATALOG NO 40083

(REORDER PRODUCT BY THIS NO.)

PRODUCT NAME TETRACHLOROETHYLENE 5000UG/ML, 1ML

DATA SHEET NO 1400830

TETRACHLOROETHYLENE

* CONTINUED *

HYDROGEN CHLORIDE

SECTION V - HEALTH HAZARD DATA

LD50	5628	MG/KG	ORAL RAT	TLV	262	MG/M3
PEL	260	MG/M3				

EMERGENCY AND FIRST AID PROCEDURES

EYES

FLUSH EYES WITH WATER FOR 15 MINUTES.

CONTACT A PHYSICIAN.

SKIN

FLUSH SKIN WITH LARGE VOLUMES OF WATER.

INHALATION

IMMEDIATELY MOVE TO FRESH AIR.

IF BREATHING STOPS, GIVE ARTIFICIAL RESPIRATION

CONTACT A PHYSICIAN

INGESTION

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON

NEVER TRY TO MAKE AN UNCONSCIOUS PERSON VOMIT

GIVE 2 TABLESPOONS OF BAKING SODA IN A GLASS OF WATER

PRESS FINGERS TO BACK OF TONGUE TO INDUCE VOMITING.

IMMEDIATELY CONTACT A PHYSICIAN.

EFFECTS OF OVEREXPOSURE

HARMFUL IF INHALED

MAY BE FATAL IF SWALLOWED

CONTAINS MATERIAL(S) KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER.

HEADACHE

NAUSEA

GASTROINTESTINAL DISTURBANCES

BLINDNESS

SECTION VI - REACTIVITY DATA

STABILITY STABLE.

CONDITIONS TO AVOID

N/A

INCOMPATIBILITY

OXIDIZING AGENTS

DATE 5/10/93

MATERIAL SAFETY DATA SHEET

PAGE 3

CATALOG NO 40083 (REORDER PRODUCT BY THIS NO.)
PRODUCT NAME TETRACHLOROETHYLENE 5000UG/ML, 1ML
DATA SHEET NO 1400830
TETRACHLOROETHYLENE

SECTION VI - REACTIVITY DATA

* CONTINUED *

CHROMIC ANHYDRIDE, LEAD PERCHLORATE, PERCHLORIC ACIDS

HAZARDOUS DECOMPOSITION PRODUCTS

HYDROGEN CHLORIDE

HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

CONDITIONS TO AVOID

N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

TAKE UP WITH ABSORBENT MATERIAL.
VENTILATE AREA.
ELIMINATE ALL IGNITION SOURCES.

WASTE DISPOSAL METHOD

COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL REGULATIONS

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFIC TYPE)

WEAR FACE MASK WITH ORGANIC VAPOR CANISTER.

PROTECTIVE GLOVES

WEAR RUBBER GLOVES.

EYE PROTECTION

WEAR PROTECTIVE GLASSES.

VENTILATION

USE ONLY IN WELL VENTILATED AREA.

SPECIAL

N/A

DATE 5/10/93

MATERIAL SAFETY DATA SHEET

PAGE 4

CATALOG NO 40083

(REORDER PRODUCT BY THIS NO.)

PRODUCT NAME TETRACHLOROETHYLENE 5000UC/ML. 1ML.

DATA SHEET NO 1400830

TETRACHLOROETHYLENE

SECTION VIII - SPECIAL PROTECTION INFORMATION

* CONTINUED *

OTHER PROTECTIVE EQUIPMENT

N/A

SECTION IX - SPECIAL PRECAUTIONS

STORAGE AND HANDLING

REFRIGERATE IN SEALED CONTAINER.
KEEP AWAY FROM OXIDIZERS.
KEEP AWAY FROM IGNITION SOURCES.

OTHER PRECAUTIONS

AVOID EYE OR SKIN CONTACT.
AVOID BREATHING VAPORS.

WHILE THE INFORMATION AND RECOMMENDATIONS SET FORTH HEREIN ARE BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, SUPELCO, INC. MAKES NO WARRANTY WITH RESPECT HERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

LAST REVISED 11/24/92

Material Safety Data Sheet

U.S. Department of Labor

Required under OSHA Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

Occupational Safety and Health Administration

OHS to
Expiration Dt

PREPARED 1/10/86

Section I

Manufacturer's Name

ALCONOX, INC.

Emergency Teleph

(212) 473-130

Address (Number, Street, City, State, and ZIP Code)

215 PARK AVENUE SOUTH

Chemical Name
and Synonyms

N.A.

NEW YORK, N.Y. 10003

Trade Name
and Synonyms

LIQUI-NOX

Chemical
Family

ANIONIC DETERGENT

Formula

N.A.

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents

% TLV (Units) Alloys and Metallic Coatings

Paints, Preservatives, and Solvents	% TLV (Units)	Alloys and Metallic Coatings	%
Pigments	NONE	Base Metal	NONE
Catalyst	NONE	Alloys	NONE
Vehicle	NONE	Metallic Coatings	NONE
Solvents	ETHYLENE GLYCOL MONO-BUTYL ETHER 4	Filler Metal Plus Coating or Core Flux	25 NONE
Additives	NONE	Others	NONE
Others	NONE		

Hazardous Mixtures of Other Liquids, Solids or Gases

NONE			

Section III - Physical Data

Boiling Point (°F)	210	Specific Gravity (H ₂ O=1)	1.0
Vapor Pressure (mm Hg.)	NO DATA	Percent Volatile by Volume (%)	3
Vapor Density (Air=1)	NO DATA	Evaporation Rate	SLOWER THAN ETHER

Solubility in Water

COMPLETE

Appearance and Odor

YELLOW LIQUID - PRACTICALLY ODORLESS

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)

NONE (CLOSED CUP)

Flammable Limits

NA

Lat

NA

Ust

Extinguishing Media

WATER, CO₂, DRY CHEMICAL, FOAM, SAND/EARTH

Special Fire Fighting Procedures

FOR FIRES INVOLVING THIS MATERIAL, DO NOT ENTER WITHOUT PROTECTIVE EQUIPMENT AND SELF CONTAINED BREATHING APPARATUS

Overall Fire and Explosion Hazards

NONE

Section V - Health Hazard Data

Threshold Limit Value **NO DATA AVAILABLE**

Effects of Overexposure **CONTACT WITH EYES AND MUCOUS MEMBRANES MAY BE IRRITATING**

Emergency First Aid Procedures **EYES-FLUSH WITH PLENTY OF WATER FOR 15 MINUTES. SKIN-FLUSH WITH PLENTY OF WATER. INGESTION - INDUCE VOMITING AND CONSULT A PHYSICIAN.**

Section VI - Reactivity Data

Stability	Unstable	Conditions to Avoid	NONE
	Stable X		

Incompatibility (Materials to Avoid) **STRONG OXIDIZING AGENTS**

Hazardous Decomposition Products **CO, CO₂, SO₂, MAY BE RELEASED ON BURNING**

Hazardous Polymerization	May Occur	Conditions to Avoid	NONE
	Will Not Occur X		

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled **MATERIAL FOAMS PROFUSELY. RECOVER AS MUCH AS POSSIBLE WITH ABSORBENT MATERIAL AND RINSE REMAINDER TO SEWER. MATERIAL IS COMPLETELY BIODEGRADABLE.**

Waste Disposal Method **SMALL QUANTITIES MAY BE DISPOSED OF IN SEWER. LARGE QUANTITIES SHOULD BE SOAKED UP WITH ABSORBENT MATERIAL AND DISPOSED OF ACCORDING TO LOCAL REQUIREMENTS FOR NON-HAZARDOUS DETERGENT.**

Section VIII - Special Protection Information

Respiratory Protection (Specify Type) **NOT NECESSARY**

Ventilation	Local Exhaust	NORMAL	Special	N.A.
	Mechanical (General)	N.A.	Other	N.A.

Protective Gloves **REQUIRED** Eye Protection **REQUIRED**

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storage **NONE REQUIRED - VISCOSITY OF MATERIAL INCREASES AT VERY LOW TEMPERATURES.**

Other Precautions **NO SPECIAL REQUIREMENTS OTHER THAN THE GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES EMPLOYED WITH ANY INDUSTRIAL CHEMICAL.**

DATE: 04/10/90
INDEX: 30900990023ACCT: 080628-01
CAT NO: A+6+4

PO NBR: 15378-003

*2-PROPANOL**
*2-PROPANOL**
2-PROPANOL

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

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SUBSTANCE IDENTIFICATION

CAS-NUMBER 67-63-0

SUBSTANCE: **2-PROPANOL**

TRADE NAMES/SYNONYMS:
ISOPROPANOL; LUTOSOL; PETROHOL; DIMETHYLCARBINOL; IPA; AVANTIN; PROPAN-2-OL;
ALCOSOLVE 2; AVANTINE; ISOPROPYL ALCOHOL; ALCOJEL; ISOHOL; N-PROPAN-2-OL;
SEC-PROPYL ALCOHOL; PRO; STCC 4909205; UN 1219; A-415; A-416; A-417;
A-426; A-419; A-432; A-451; A-519; A-520; ACC12090

CHEMICAL FAMILY:
HYDROXYL, ALIPHATIC

MOLECULAR FORMULA: C3-H8-O

MOLECULAR WEIGHT: 60.11

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: 2-PROPANOL PERCENT: 100

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

ISOPROPYL ALCOHOL (ISOPROPANOL; 2-PROPANOL):
400 PPM (980 MG/M3) OSHA TWA; 500 PPM (1225 MG/M3) OSHA STEL
400 PPM (980 MG/M3) ACGIH TWA; 500 PPM (1225 MG/M3) ACGIH STEL
400 PPM NIOSH RECOMMENDED 10 HOUR TWA;
800 PPM NIOSH RECOMMENDED 15 MINUTE CEILING

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

PHYSICAL DATA

DESCRIPTION: TRANSPARENT, COLORLESS, MOBILE LIQUID WITH A CHARACTERISTIC MILD ALCOHOLIC ODOR AND A SLIGHTLY BITTER TASTE. BOILING POINT: 180 F (82 C)

MELTING POINT: -129 F (-89 C) SPECIFIC GRAVITY: 0.785 VOLATILITY: 100%

VAPOR PRESSURE: 40 MMHG @ 23.8 C EVAPORATION RATE: (BUTYL ACETATE=1) 2.88

SOLUBILITY IN WATER: SOLUBLE ODOR THRESHOLD: 50 PPM VAPOR DENSITY: 2.1

SOLVENT SOLUBILITY: SOLUBLE IN ETHANOL, ETHER, CHLOROFORM, ACETONE,
BENZENE; INSOLUBLE IN SALT SOLUTIONS.

VISCOSITY: 2.1 CP @ 25 C

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
DANGEROUS FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK.

VAPOR-AIR MIXTURES ARE EXPLOSIVE ABOVE FLASH POINT.

FLASH POINT: 53 F (12 C) (CC) UPPER EXPLOSIVE LIMIT: 12.7% @ 93 C

LOWER EXPLOSIVE LIMIT: 2.0% AUTOIGNITION TEMP.: 750 F (399 C)

DRAFT

DATE: 04/10/90
INDEX: 30900990023

ACCT: 080628-01
CAT NO: A4644

PO NBR: 15378-003

OILS. IT IS NOT CLEAR WHICH SUBSTANCES ARE RESPONSIBLE.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
ISOPROPYL ALCOHOL (ISOPROPRANOL; 2-PROPANOL):
NARCOTIC.

ACUTE EXPOSURE- CONTACT WITH THE SKIN MAY CAUSE SLIGHT IRRITATION. CONTACT DERMATITIS HAS BEEN REPORTED IN A FEW SENSITIVE INDIVIDUALS. SUBSTANCE MAY BE DERMALLY ABSORBED RESULTING IN SYSTEMIC TOXICITY AS DETAILED IN ACUTE INGESTION. TOXIC EFFECTS MAY BECOME MORE MARKED IF ABSORPTION AND INHALATION OCCUR CONCURRENTLY.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE DERMATITIS DUE TO THE DEFATTING ACTION ON THE SKIN. REPEATED AND PROLONGED EXPOSURE TO THE SKIN OF RABBITS CAUSED SLIGHT ERYTHEMA, DRYING, AND SUPERFICIAL DESQUAMATION.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
ISOPROPYL ALCOHOL (ISOPROPRANOL; 2-PROPANOL):
IRRITANT.

ACUTE EXPOSURE- 400-800 PPM MAY CAUSE IRRITATION. IN RABBIT EYES, A DROP CAUSED MILD TRANSITORY INJURY AND A 50% AQUEOUS SOLUTION AFTER 3 MINUTES CAUSED MODERATE IRRITATION. CONTACT WITH A 70% SOLUTION CAUSED CONJUNCTIVITIS, IRITIS, AND CORNEAL OPACITY.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE TO VAPORS MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
ISOPROPYL ALCOHOL (ISOPROPRANOL; 2-PROPANOL):
NARCOTIC.

ACUTE EXPOSURE- INGESTION MAY CAUSE ABDOMINAL PAIN, HEMATEMESIS, NAUSEA, VOMITING, AND HEMORRHAGE. CENTRAL NERVOUS SYSTEM DEPRESSION MAY OCCUR WITH HEADACHE, DIZZINESS, FLUSHING, INCOORDINATION, STUPOR, CONFUSION, HYPOTENSION, AREFLEXIA, AND REFRACTORY NARCOSIS. OLIGURIA FOLLOWED BY DIURESIS AND COMA MAY ALSO OCCUR. OTHER SYMPTOMS MAY INCLUDE HYPOGLYCEMIA, TENDERNESS AND EDEMA OF MUSCLES, AND ARRHYTHMIAS. VOMITING WITH ASPIRATION MAY CAUSE ASPIRATION PNEUMONIA. DEPRESSED RESPIRATION AND DEATH DUE TO RESPIRATORY PARALYSIS MAY OCCUR IN A FEW HOURS AFTER EXPOSURE. SEVERE AND PROLONGED SHOCK MAY LEAD TO SERIOUS OR FATAL RENAL DAMAGE AFTER SEVERAL DAYS. PATHOLOGIC FINDINGS HAVE INCLUDED EXTENSIVE HEMORRHAGIC TRACHEOBRONCHITIS, BRONCHOPNEUMONIA AND HEMORRHAGIC PULMONARY EDEMA.

CHRONIC EXPOSURE- NO ADVERSE EFFECTS RESULTED IN HUMANS FOLLOWING DAILY INGESTION OF 2.6 AND 6.4 MG/KG FOR 6 WEEKS. RATS THAT INGESTED 0.5 TO 10.0% ISOPROPYL ALCOHOL IN DRINKING WATER FOR 27 WEEKS SHOWED DECREASED BODY WEIGHT. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID- IN RESPIRATORY DEPRESSION, GIVE OXYGEN BY ARTIFICIAL RESPIRATION. GIVE ACTIVATED CHARCOAL. GASTRIC LAVAGE WITH PROTECTED AIRWAY IS USEFUL EVEN IF DELAYED. DO NOT ATTEMPT EMESIS IF RESPIRATION IS DEPRESSED. MAINTAIN BLOOD PRESSURE. TREATMENT SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL. (DREIBACH, HANDBOOK OF POISONING, 11TH ED.) GET MEDICAL ATTENTION.

ANTIDOTE:
NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

REACTIVITY

REACTIVITY:
MAY SLOWLY PEROXIDISE ON EXPOSURE TO AIR AND UNDER NORMAL STORAGE CONDITIONS. AN EXPLOSION HAZARD MAY EXIST IF THE SUBSTANCE IS DISTILLED OR ALLOWED TO EVAPORATE TO DRYNESS.

INCOMPATIBILITIES:
ISOPROPYL ALCOHOL (ISOPROPRANOL; 2-PROPANOL):
ALUMINUM: DISSOLUTION IS EXOTHERMIC.
BARIUM PERCHLORATE: FORMATION OF EXPLOSIVE COMPOUND.
2-BUTANONE (METHYL ETHYL KETONE): ACCELERATES THE PEROXIDATION OF THE ALCOHOL.
CHROMIUM TRIOXIDE (GRANULAR): IGNITION.
COATINGS: MAY BE ATTACKED.
DIOXYGENYL TETRAFLUOROBORATE: IGNITION AT AMBIENT TEMPERATURES.
HYDROGEN + PALLADIUM (PARTICLES): IGNITION ON EXPOSURE TO AIR.
HYDROGEN PEROXIDE: FORMATION OF EXPLOSIVE COMPOUND.
KETONES: MARKEDLY INCREASES THE POSSIBILITY OF PEROXIDATION.

DRAFT

DATE: 04/10/90
INDEX: 30900990023

ACCT: 080628-01
CAT NO: A4644

PAGE: 4
PO NBR: 15378-003

NITROFORM (TRINITROMETHANE): DISSOLVES LIBERATING HEAT AND POSSIBLY EXPLODING.
OIL: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
OXYGEN (GAS): AUTOXIDATION, ON EXPOSURE TO LIGHT, RESULTS IN FORMATION OF KETONES AND POTENTIALLY EXPLOSIVE HYDROGEN PEROXIDE.
PHOSGENE: IN THE PRESENCE OF IRON SALTS, MAY EXPLODE.
PLASTICS: MAY BE ATTACKED.
POTASSIUM TERT-BUTOXIDE: IGNITION.
RUBBER: MAY BE ATTACKED.
SODIUM DICHROMATE + SULFURIC ACID: EXOTHERMIC REACTION WITH POSSIBLE INCANDESCENCE.
SEE ALSO ALCOHOLS.

DECOMPOSITION:
THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON.

POLYMERIZATION:
HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

****STORAGE****

PRESERVE IN TIGHT CONTAINERS, REMOTE FROM HEAT. (U. S. PHARMACOPEIA, NATIONAL FORMULARY, 1985).

STORE IN ACCORDANCE WITH 29 CFR 1910.106.

BONDING AND GROUNDING: SUBSTANCES WITH LOW ELECTROCONDUCTIVITY, WHICH MAY BE IGNITED BY ELECTROSTATIC SPARKS, SHOULD BE STORED IN CONTAINERS WHICH MEET THE BONDING AND GROUNDING GUIDELINES SPECIFIED IN NFPA 77-1983, RECOMMENDED PRACTICE ON STATIC ELECTRICITY.

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

****DISPOSAL****

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER D001.

100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. VAPORS MAY BE EXPLOSIVE AND POISONOUS; DO NOT ALLOW UNNECESSARY PERSONNEL. DO NOT OVERHEAT CONTAINERS; CONTAINERS MAY VIOLENTLY RUPTURE AND TRAVEL A CONSIDERABLE DISTANCE IN HEAT OF FIRE.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS. VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

RESPIRATOR:
THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U. S. DEPARTMENT OF LABOR, 29CFR1910 SUBPART Z.
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

OPROPYL ALCOHOL:

1000 PPM- ANY POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR

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INDEX: 30900990023

ACCT: 080628-01
CAT NO: A4644

PO NBR: 15378-003

CARTRIDGE(S).
ANY CHEMICAL CARTRIDGE RESPIRATOR WITH A FULL FACEPIECE AND ORGANIC VAPOR CARTRIDGE(S).

10,000 PPM- ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.

12,000 PPM- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER. ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE. ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.

ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER. ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:

EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC, INC.
CREATION DATE: 02/26/85 REVISION DATE: 10/13/89

-ADDITIONAL INFORMATION-

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APPENDIX A

PROPOSED MONITOR WELLS AND LOCATIONS

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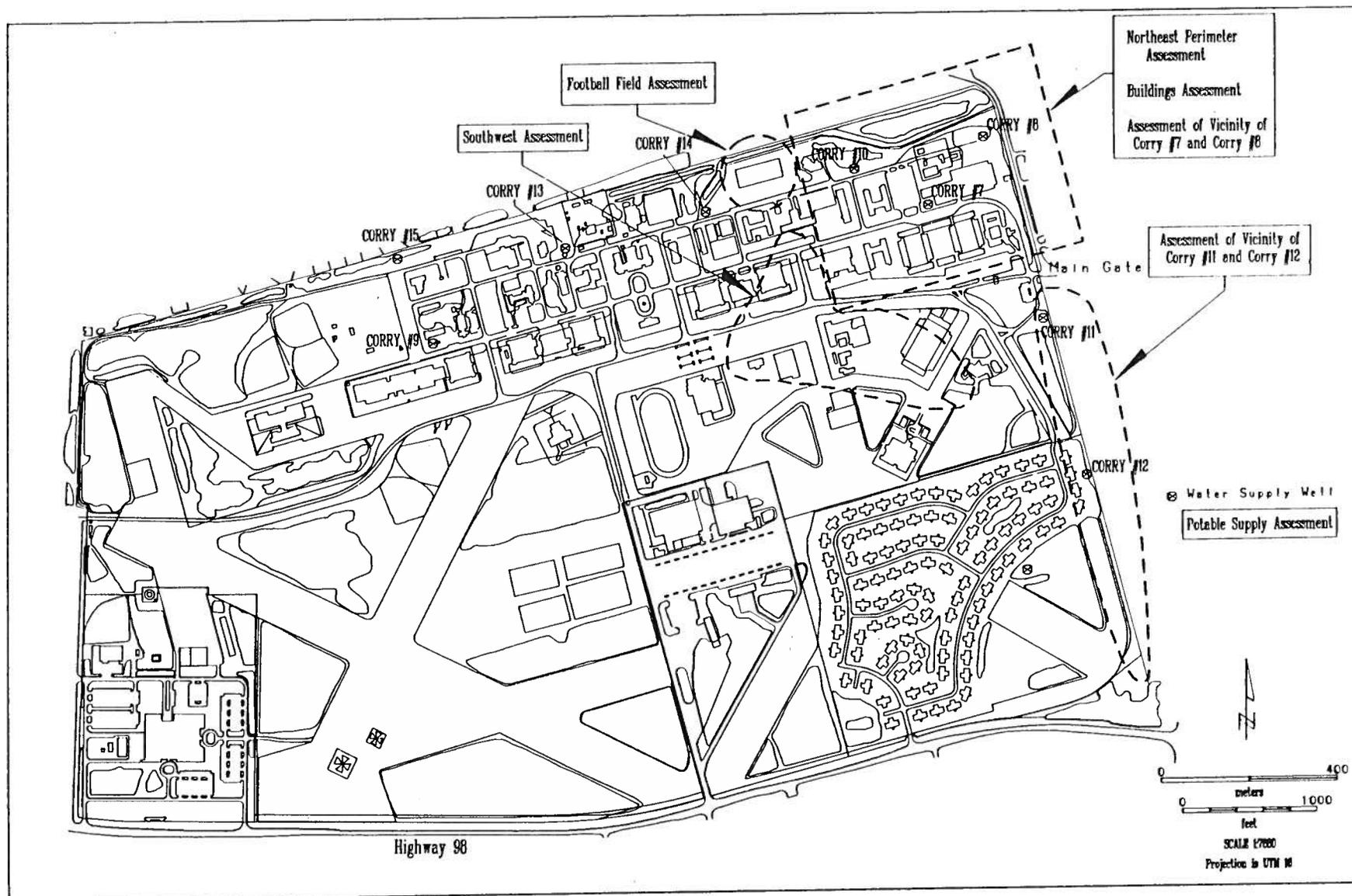


Figure 9-3. Targeted Areas for the Site-Specific Assessments.

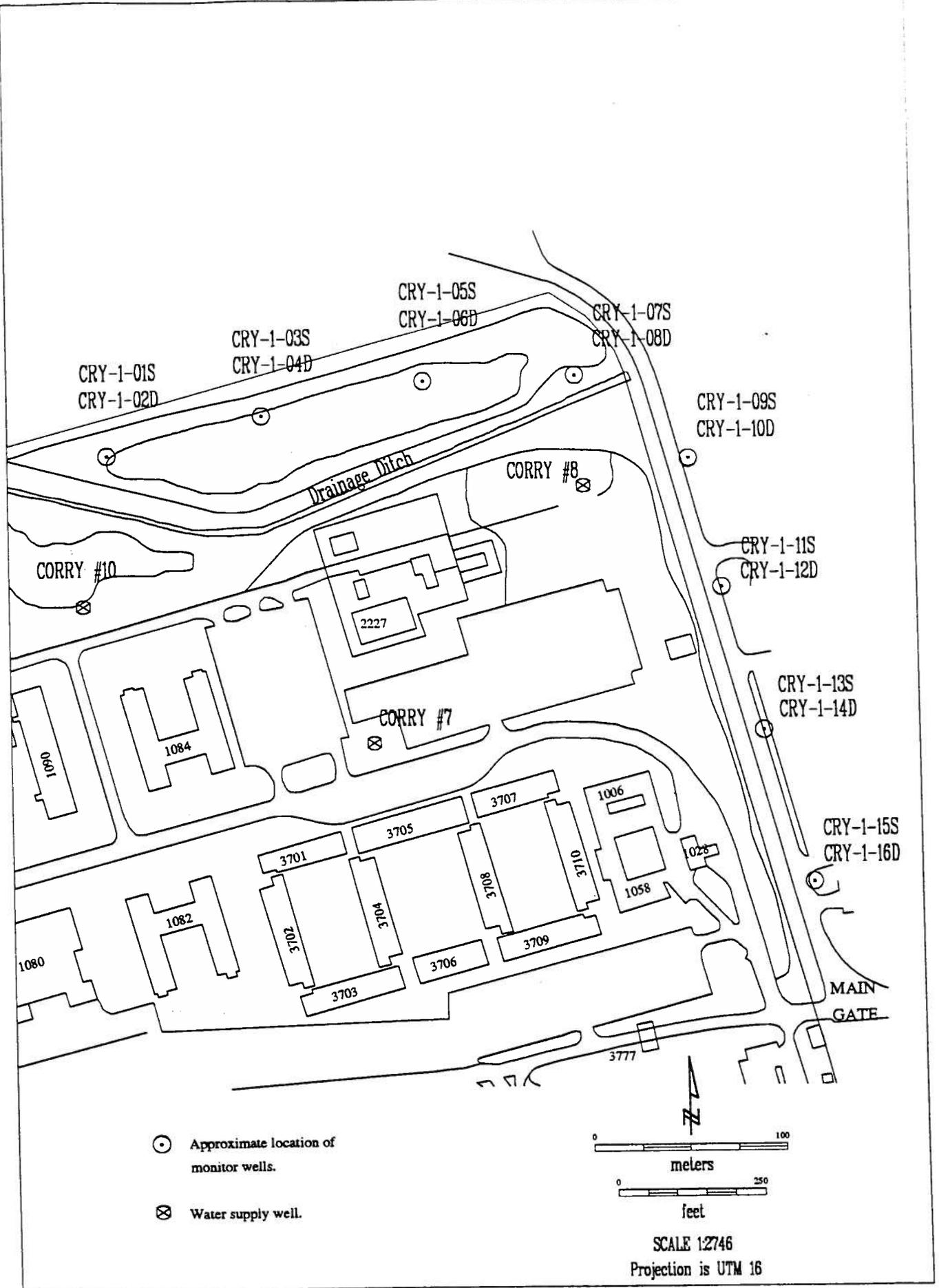


Figure 9-4. Northeast Perimeter Assessment.

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Figure 9-5. Buildings Assessment.

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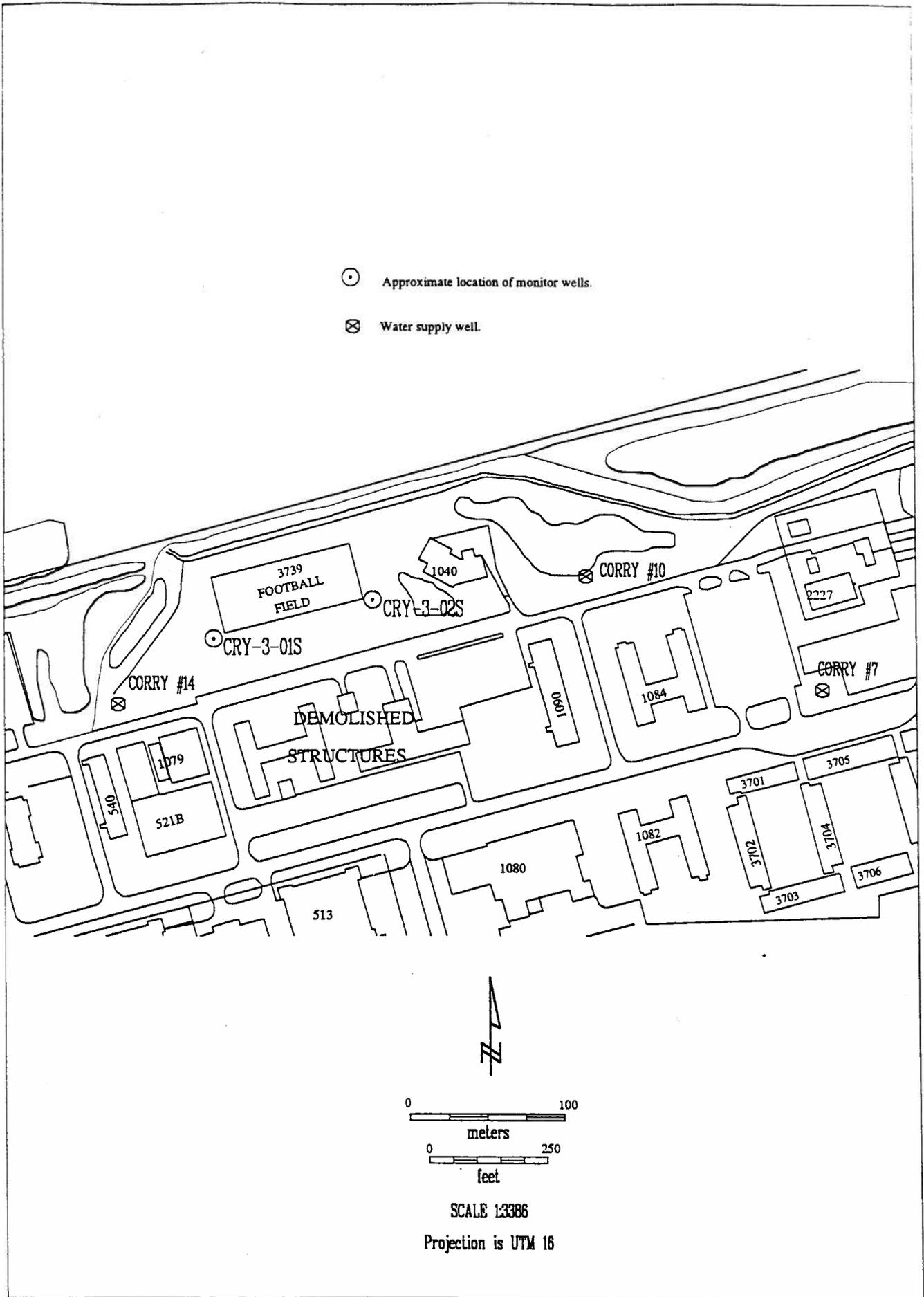


Figure 9-6. Football Field Assessment.

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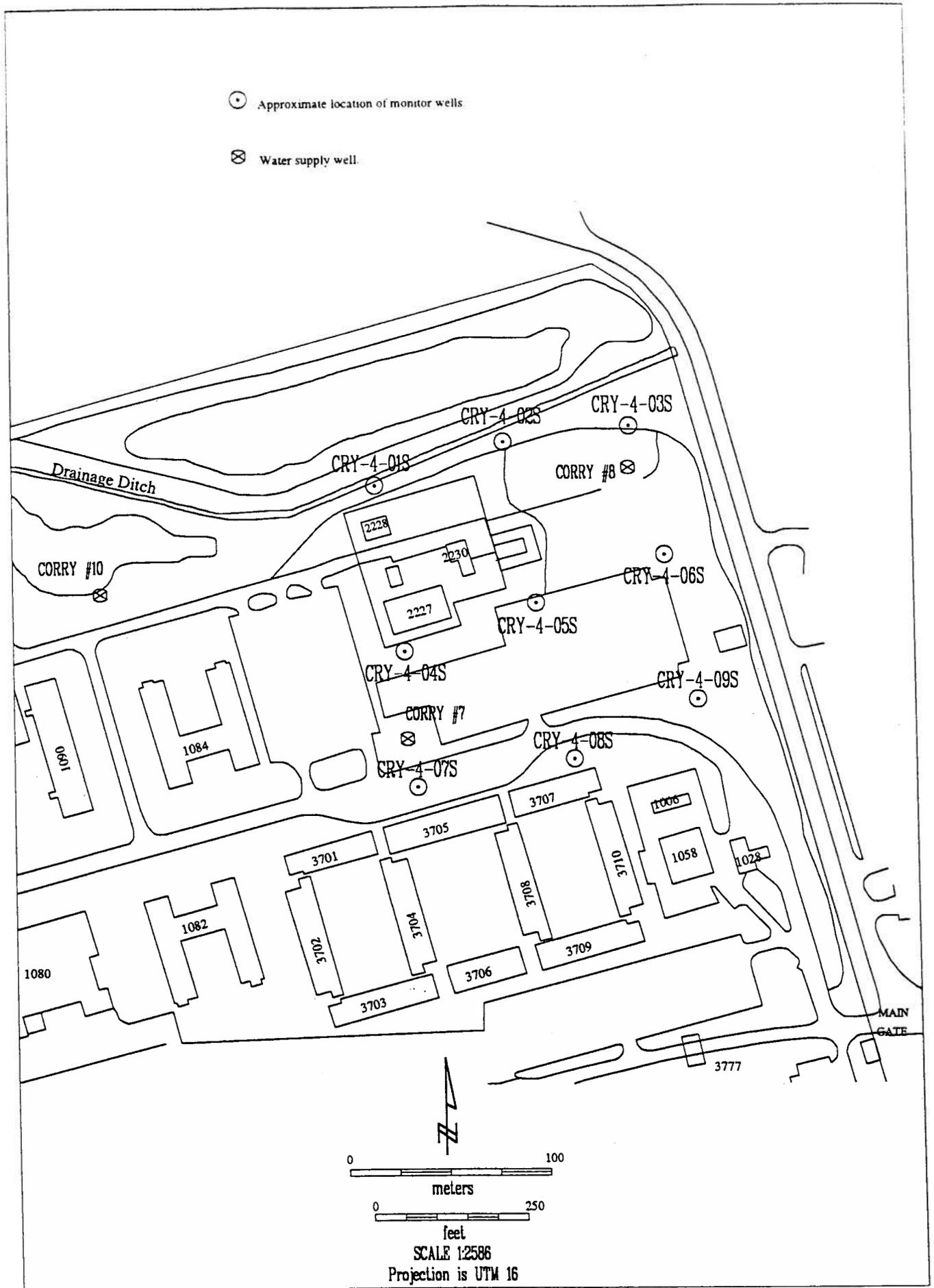


Figure 9-7. Assessment in the Vicinity of Corry #7 and #8

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- Approximate location of monitor wells.
- ⊗ Water supply well.

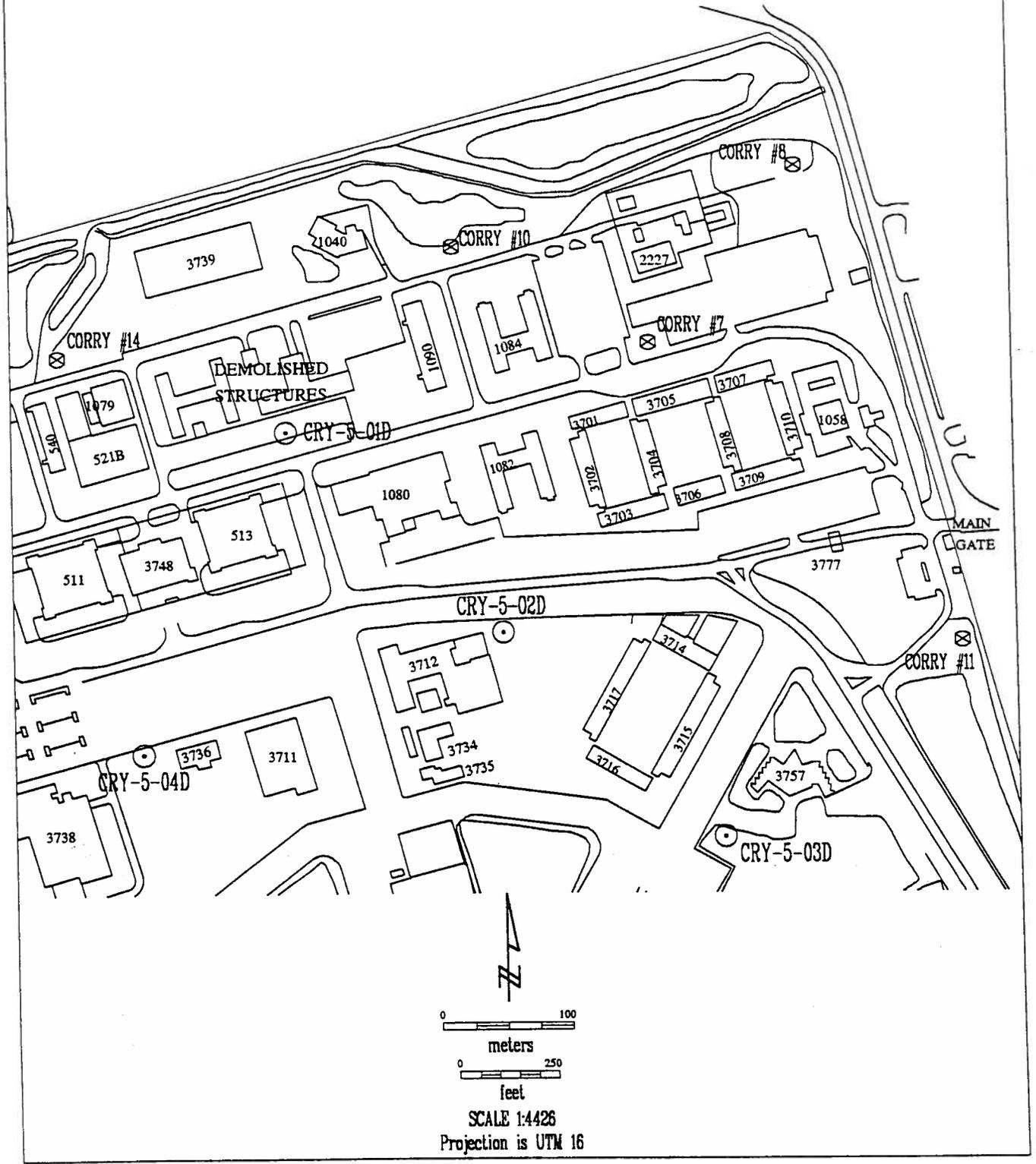


Figure 9-8. Southwest Assessment.

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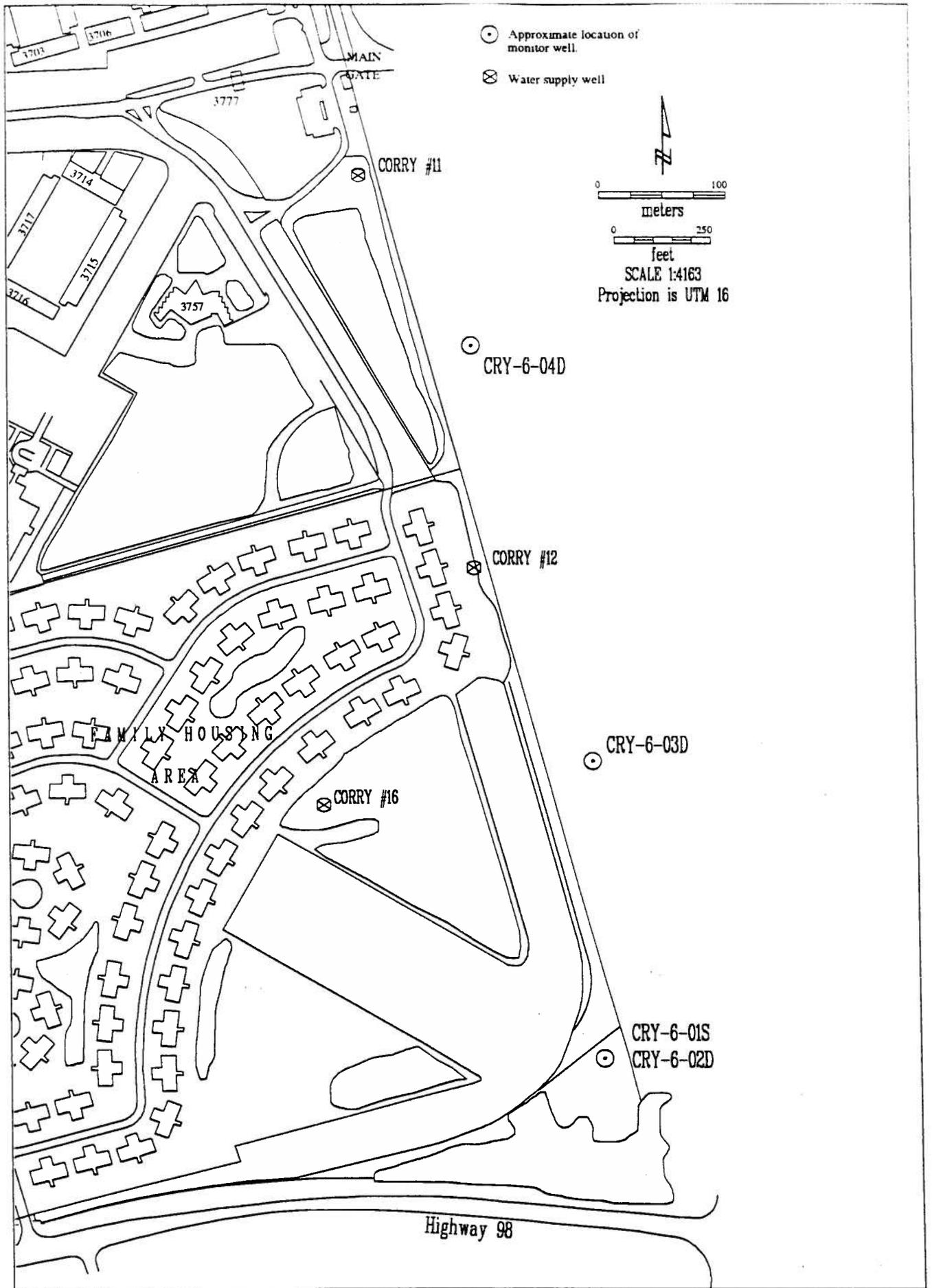
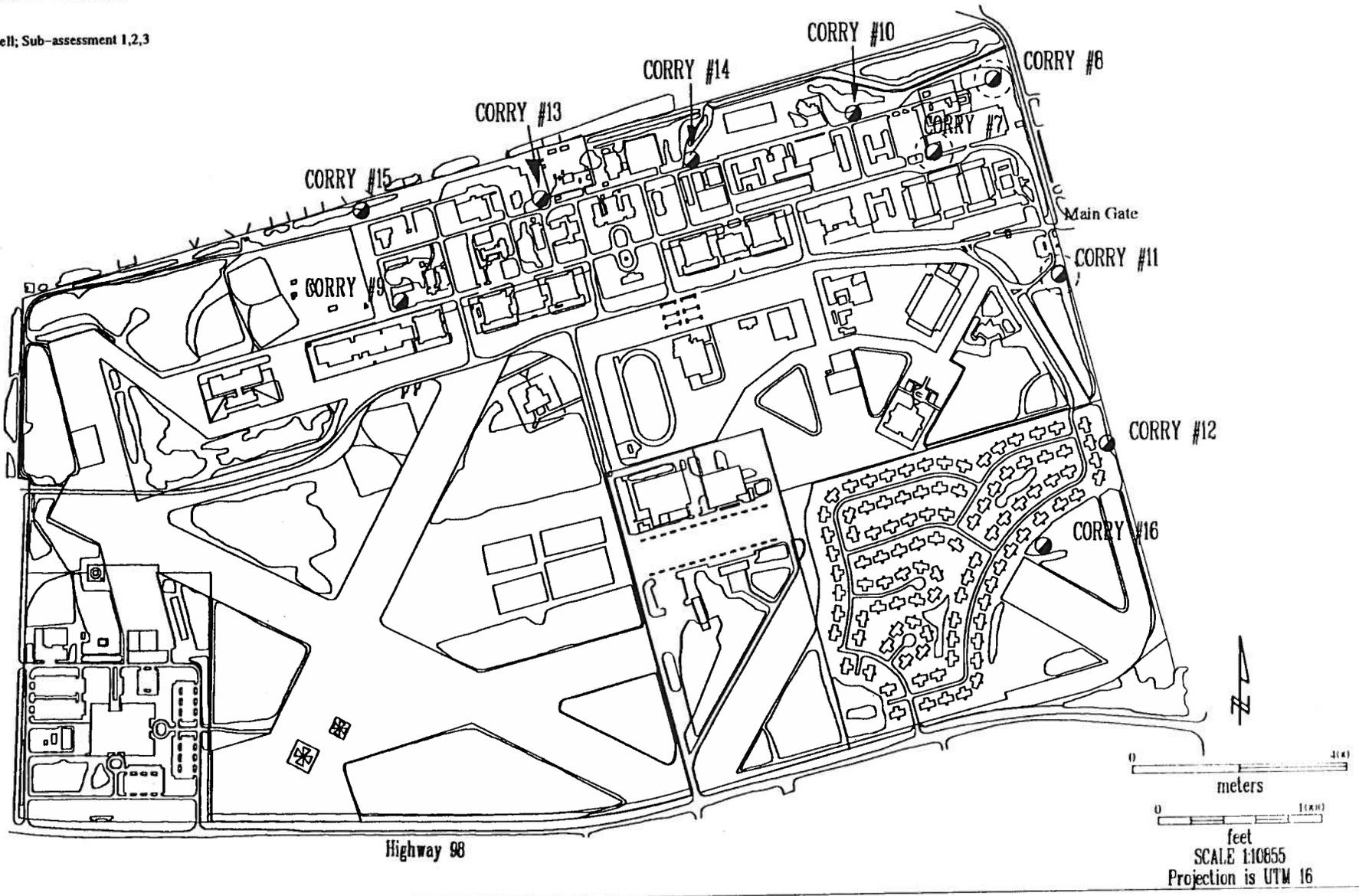


Figure 9-9. Assessment in the Vicinity of Corry #11 and #12.

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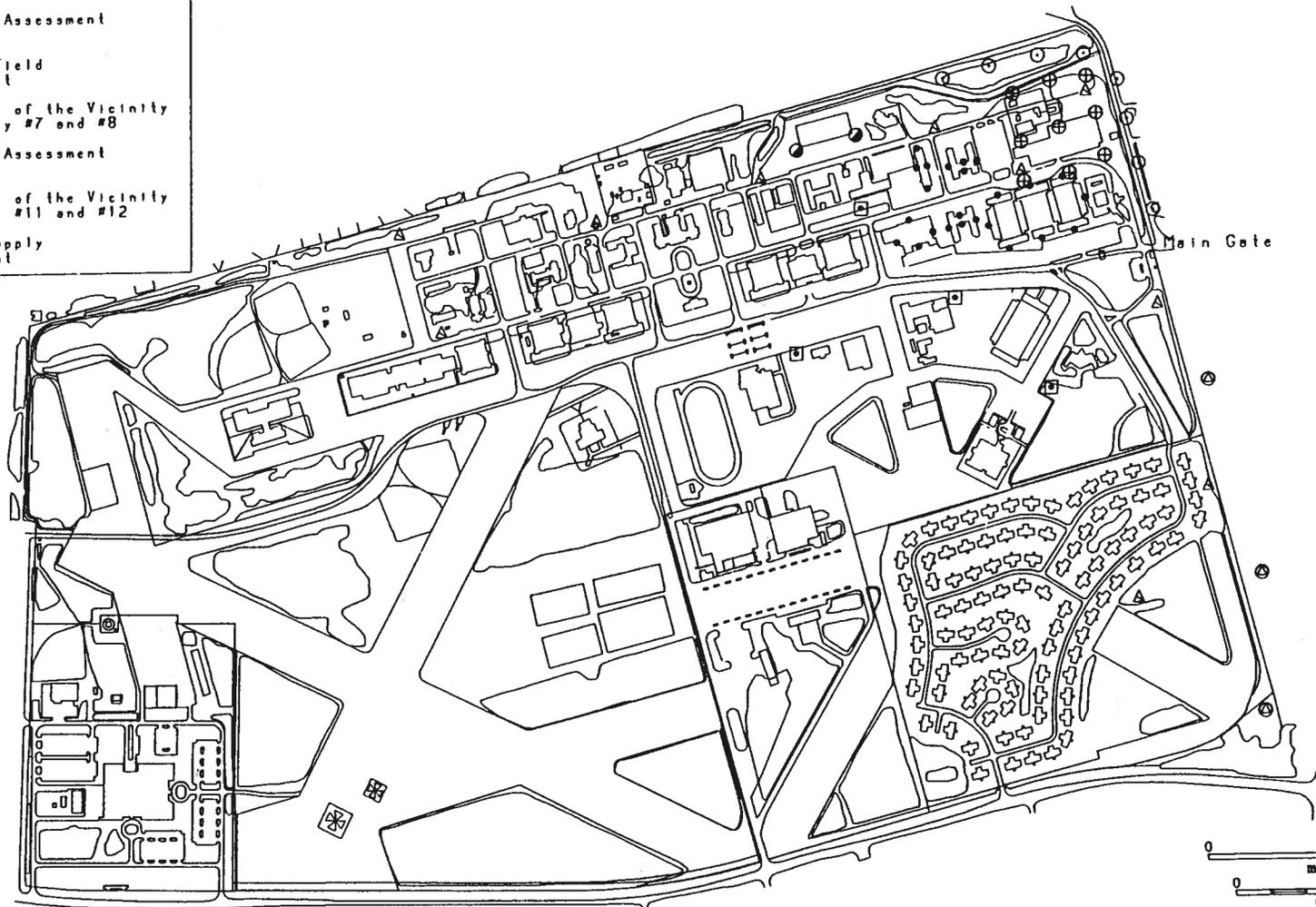
- Water supply well; Sub-assessment 1
- ⊙ Water supply well; Sub-assessment 1,2,3



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Figure 9-10. Potable Supply Assessment.

- ⊙ Northeast Perimeter Assessment
- Buildings Assessment
- ⊙ Football Field Assessment
- ⊕ Assessment of the Vicinity of Corry #7 and #8
- ⊠ Southwest Assessment
- ⊕ Assessment of the Vicinity of Corry #11 and #12
- ▲ Potable Supply Assessment



Highway 98

Main Gate

0 400
meters
0 1000
feet
SCALE 1:7089
Projection is UTM 18

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Figure 9-II. Summary of Site-Specific Assessments.