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HEALTH AND SAFETY PLAN FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR
FIELD INVESTIGATION NAS WHITING FIELD FL
1/1/1998
BROWN & ROOT ENVIRONMENTAL

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HEALTH AND SAFETY PLAN FOR RI/FS FIELD INVESTIGATION

Naval Air Station
Whiting Field
Milton, Florida



**Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order CTO-0028**

JANUARY 1998

**HEALTH AND SAFETY PLAN
FOR
RI/FS FIELD INVESTIGATION**

**NAVAL AIR STATION WHITING FIELD
MILTON, FLORIDA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT**

**Submitted to:
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Naval Facilities Engineering Command
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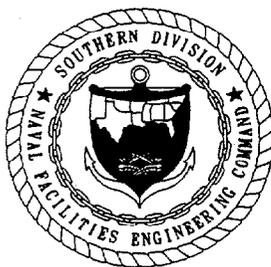
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FOREWORD

To meet its mission objectives, the U.S. Navy performs a variety of operations, some requiring the use, handling, storage, or disposal of hazardous materials. Through accidental spills and leaks and conventional methods of past disposal, hazardous materials may have entered the environment. With growing knowledge of the long-term effects of hazardous materials on the environment, the U. S. Department of Defense initiated various programs to investigate and remediate conditions related to suspected past releases of hazardous materials at its facilities.

One of these programs is the Installation Restoration (IR) program. This program complies with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), the Resource Conservation and Recovery Act, and the Hazardous and Solid Waste Amendments of 1984. These acts establish the means to assess and clean up hazardous waste sites for both private-sector and federal facilities. The CERCLA and SARA acts form the basis for what is commonly known as the Superfund program.

Originally, the Navy's part of this program was called the Naval Assessment and Control of Installation Pollutants (NACIP) program. Early reports reflect the NACIP process and terminology. The Navy eventually adopted the program structure and terminology of the standard IR program.

The IR program consists of Preliminary Assessment (PA) and Site Inspections (SIs), Remedial Investigation (RI) and Feasibility Study (FS), and Remedial Design (RD) and Remedial Action (RA) at sites where chemicals were allegedly spilled or disposed of. The PA and SI identify the presence of pollutants. The nature and extent of contamination as well as the selected remedial solutions are determined during the RI/FS. The RD and RA are performed to complete implementation of the solution.

The health and safety procedures to be followed during investigation activities at NAS Whiting Field are discussed in this report.

The Southern Division, Naval Facilities Engineering Command manages and the U.S. Environmental Protection Agency and the Florida Department of Environmental Protection (formerly the Florida Department of Environmental Regulation) oversee the Navy environmental program at Naval Air Station (NAS) Whiting Field. All aspects of the program are conducted in compliance with state and federal regulations, as ensured by the participation of these regulatory agencies.

Questions regarding the CERCLA program at NAS Whiting Field should be addressed to Ms. Linda Martin, Code 1878, at (803) 820-5574.

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been developed to provide health and safety practices and procedures for Brown & Root Environmental (B&R Environmental) and subcontractor personnel to follow while engaged in investigatory activities at the Naval Air Station Whiting Field in Milton, Florida. This HASP must be used in conjunction with the B&R Environmental Health and Safety Guidance Manual. Both of these documents must be present at the site during the performance of all site activities. The Guidance Manual provides detailed information pertaining to the HASP as well as applicable B&R Environmental Standard Operating Procedures (SOPs). This HASP and the contents of the Guidance Manual were developed to comply with the requirements stipulated in 29 CFR 1910.120 (OSHA's Hazardous Waste Operations and Emergency Response Standard).

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work at the site. The HASP will be modified if new information becomes available. All changes to the HASP will be made with the approval of the B&R Environmental Site Safety Officer (SSO) and the B&R Environmental Health and Safety Manager (HSM). Requests for modifications to the HASP will be directed to the SSO who will determine whether to make the changes. The SSO will notify the Task Order Manager (TOM), who will notify all affected personnel of changes.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for B&R Environmental and subcontractor employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for all onsite health and safety. These persons will be the primary point of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

- The B&R Environmental TOM is responsible for the overall direction of health and safety for this project.
- The Project Health and Safety Officer (PHSO) is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:

- Providing information regarding site contaminants and physical hazards associated with the site
 - Establishing air monitoring and decontamination procedures
 - Assigning personal protective equipment
 - Determining emergency response procedures and emergency contacts
 - Stipulating training requirements and reviewing appropriate training and medical surveillance certificates
 - Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
- The B&R Environmental Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed SSO. The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
 - The SSO supports site activities by advising the FOL on all aspects of health and safety on-site. These duties may include:
 - Coordinates all health and safety activities with the FOL
 - Selects, applies, inspects, and maintains personal protective equipment
 - Establishes work zones and control points
 - Implements air monitoring program for onsite activities
 - Verifies training and medical clearance of onsite personnel status in relation to site activities
 - Implements Hazard Communication and Respiratory Protection Programs
 - Coordinates emergency services.
 - Provides site specific training for all on-site personnel
 - investigates all accidents and injuries (Appendix A Illness/Injury Forms and Instructions)
 - Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the B&R Environmental CLEAN HSM.
 - In some cases one person may be designated responsibilities for more than one position. For example, at NAS Whiting Field, the FOL will also be responsible for SSO duties.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Naval Air Station, Whiting Field **Client Contact:** Linda Martin
Milton, Florida **Phone Number:** (803) 820-5574

Project Team:

B&R Environmental Personnel:

Phillip Ottinger

Bryn Howze

Bryn Howze

Matthew M. Soltis, CIH, CSP

Ginny Helms

Discipline/Tasks Assigned:

Task Order Manager (TOM)

Field Operations Leader (FOL)

Site Safety Officer (SSO)

CLEAN Health and Safety Manager

Project Health and Safety Officer (PHSO)

Other Potential B&R Environmental Project Personnel:

John Hofer

Field Geologist

Melinda Hamsher

Field Geologist

Non-B&R Environmental Personnel

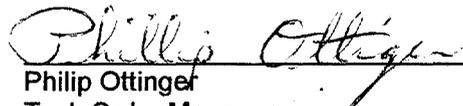
Gulf Atlantic

Affiliation/Discipline/Tasks Assigned

Drilling subcontractor

Prepared by: Ginny Helms

Reviewed and Approved by:


Phillip Ottinger
Philip Ottinger
Task Order Manager


Matthew M. Soltis
Matthew M. Soltis CIH, CSP
CLEAN Health and Safety Manager

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section has been developed as part of a preplanning effort to direct and guide field personnel in the event of an emergency. All site activities will be coordinated with Base Fire Protection and Emergency Services prior to commencement. In the event of an emergency, which cannot be mitigated using onsite resources, personnel will evacuate to a safe place of refuge and the appropriate emergency response agencies will be notified. It has been determined that the majority of potential emergency situations would be better supported by outside emergency responders. Based on this determination, B&R Environmental and subcontractor personnel will not provide emergency response support beyond the capabilities of onsite response. Workers who are ill or who have suffered a non-serious injury may be transported by site personnel to nearby medical facilities, provided that such transport does not aggravate or further endanger the welfare of the injured/ill person. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. NAS security will be notified anytime outside response agencies are contacted. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(I)(1)(ii).

B&R Environmental will, through necessary services, provide the following response measures:

- Incipient stage fire fighting support and prevention
- Incipient spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Initial medical support for injuries or illnesses requiring basic first-aid
- Site control and security measures as necessary

2.2 PRE-EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, emergencies resulting from chemical, physical, biological and fire hazards are the types of emergencies which could be encountered during site activities.

To minimize and eliminate the potential for these emergency situations, pre-emergency planning activities will include the following (which are the responsibility of the SSO and/or the FOL):

- Coordinating with local Emergency Response personnel to ensure that B&R Environmental emergency action activities are compatible with existing emergency response procedures.
- Establishing and maintaining information at the project staging area (support zone) for easy access in the event of an emergency. This information will include the following:
 - Chemical Inventory (used on-site), with Material Safety Data Sheets.
 - On-site personnel medical records (Medical Data Sheets).
 - A log book identifying personnel on site each day.
 - Hospital route maps with directions (these should also be placed in each site vehicle)

The B&R Environmental FOL will be responsible for the following tasks:

- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and to provide early recognition and prevention where possible.
- Periodically performing practice drills to ensure site workers are familiar with incidental response measures.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Emergency situations which may be encountered during site activities will generally be recognized by visual observation. Visual observation is primarily relevant for physical hazards that may be associated with the proposed scope of work. Visual observation will also play a role in detecting some chemical hazardous. To adequately recognize chemical exposures, site personnel must have a clear knowledge of signs and symptoms of exposure associated with site contaminants. This information is provided in Table 6-1. Tasks to be performed at the site, potential hazards associated with those tasks and the recommended control methods are discussed in detail in Section 5.0 and 6.0. Additionally, early recognition of hazards will be supported by daily site surveys to eliminate any situation predisposed to an emergency. The FOL and the SSO will be responsible for performing surveys and documenting findings

in the Site Health and Safety logbook, however, all site personnel will be responsible for reporting hazardous situations. Where potential hazards exist, B&R Environmental will initiate control measures to prevent adverse effects to human health and the environment.

The above actions will provide early recognition for potential emergency situations, and allow B&R Environmental to instigate necessary control measures. However, if the FOL and the SSO determine that control measures are not sufficient to eliminate the hazard, B&R Environmental will withdraw from the site and notify the appropriate response agencies listed in Table 2-1.

2.3.2 Prevention

B&R Environmental and subcontractor personnel will minimize the potential for emergencies by following the Health and Safety Guidance Manual and ensuring compliance with the HASP and applicable OSHA regulations. Daily site surveys will also assist in prevention of illness/injuries when hazards are recognized early and control measures initiated.

2.4 EVACUATION ROUTES, PROCEDURES, AND PLACES OF REFUGE

An evacuation will be initiated whenever recommended hazard controls are insufficient to protect the health, safety or welfare of site workers. Specific examples of conditions that may initiate an evacuation include, but are not limited to the following: severe weather conditions; fire or explosion; monitoring instrumentation readings which indicate levels of contamination are greater than instituted action levels; evidence of personnel overexposure to potential site contaminants.

In the event that an emergency requiring evacuation occurs, all personnel will immediately stop activities and report to the designated safe place of refuge unless doing so would pose additional risks. When evacuation to the primary place of refuge is not possible, personnel will proceed to a designated alternate location and remain until further notification from the B&R Environmental FOL. Safe places of refuge will be identified prior to the commencement of site activities by the SSO and will be conveyed to personnel as part of the pre-activities training session. This information will be reiterated during daily safety meetings. Whenever possible, the safe place of refuge will also serve as the telephone communications point for that area. During an evacuation, personnel will remain at the refuge location until directed otherwise by the B&R Environmental FOL or the on-site Incident Commander of the Emergency Response Team. The FOL or the SSO will perform a head count at this location to account for and to confirm the location of all site personnel. Emergency response personnel will be immediately notified of any unaccounted personnel. The SSO will document the names of all personnel on site (on a daily basis) in the site Health

TABLE 2-1

**EMERGENCY REFERENCE
NAS WHITING FIELD
MILTON, FLORIDA**

CONTACT	PHONE NUMBER
EMERGENCY (Milton Police, Fire, and Ambulance Services)	911
Santa Rosa Medical Center (Primary Hospital)	(904) 623-9741
West Florida Regional Medical Center (Alternate Hospital)	(904) 478-4460
Navy Onsite Representative at NAS Whiting Field Jim Holland	(904) 623-7181 ext. 149
NAS Safety Office	TBD
Chemtrec National Response Center	(800) 424-9300 (800) 424-8802
B&R Environmental Office on Base FOL Bryn Howze	TBD
B&R Environmental, Oak Ridge Office	(423) 483-9900
B&R Environmental, Pittsburgh Office	(412) 921-7090
Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health and Safety Officer Ginny Helms	(770) 413-0965
Task Order Manager Phillip Ottinger	(423) 483-9900
Utilities Jim Holland	(904) 623-7181 ext. 149

and Safety logbook. This information will be utilized to perform the head count in the event of an emergency.

Evacuation procedures will be discussed during the pre-activities training session prior to the initiation of project tasks. Evacuation routes from the site and safe places of refuge are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) may dictate evacuation routes. As a result, assembly points will be selected and communicated to the workers relative to the site location where work is being performed. Evacuation should always take place in an upwind direction from the site.

2.5 DECONTAMINATION PROCEDURES / EMERGENCY MEDICAL TREATMENT

During an evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. In all other cases, decontamination procedures listed in Table 5-1 will be followed.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

B&R Environmental personnel will be working in close proximity to each other at NAS Whiting Field. As a result, hand signals, voice commands, and line of site communication will be sufficient to alert site personnel of an emergency. When project tasks are performed simultaneously on different sites, vehicle horns will be used to communicate emergency situations.

If an emergency warranting evacuation occurs, the following procedures are to be initiated:

- Initiate the evacuation via hand signals, voice commands, line of site communication, or vehicle horns. The following signals shall be utilized when communication via vehicle horn is necessary:

HELP	three short blasts	(. . .)
EVACUATION	three long blasts	(- - -)

- Report to the designated refuge point.
- Describe to the FOL (FOL will serve as the Incident Coordinator) pertinent incident details. Once all personnel are evacuated, appropriate response procedures will be enacted to control the situation.

In the event that site personnel cannot mitigate the hazardous situation, the FOL and SSO will enact emergency notification procedures to secure additional assistance in the following manner:

- Dial 911 or call other emergency contacts (Table 2-1) and report the incident. Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of the incident. Stay on the phone and follow the instructions given by the operator. The operator will then notify and dispatch the proper emergency response agencies.

2.7 PPE AND EMERGENCY EQUIPMENT

A first-aid kit, eye wash units (or bottles of disposable eyewash solution) and fire extinguishers (strategically placed) will be maintained on-site and shall be immediately available for use in the event of an emergency. This equipment will be located in the field office as well as in each site vehicle. At least one first aid kit supplied with equipment to protect against bloodborne pathogens should be available onsite.

2.8 EMERGENCY CONTACTS

Prior to initiating field activities, all personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to all site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

2.9 EMERGENCY ROUTE TO HOSPITAL

Directions to Santa Rosa Medical Center (Primary)

Travel 1 mile west of the base on Highway 87A, turn left. Drive 5.5 miles south on Highway 89 to Berry Hill Road, turn right. Travel 1.7 miles and the hospital is on the right.

Prior to site mobilization for field activities, a legible map indicating the travel route from the site to the Medical Center will be obtained and inserted as Figure 2-1 of this HASP.

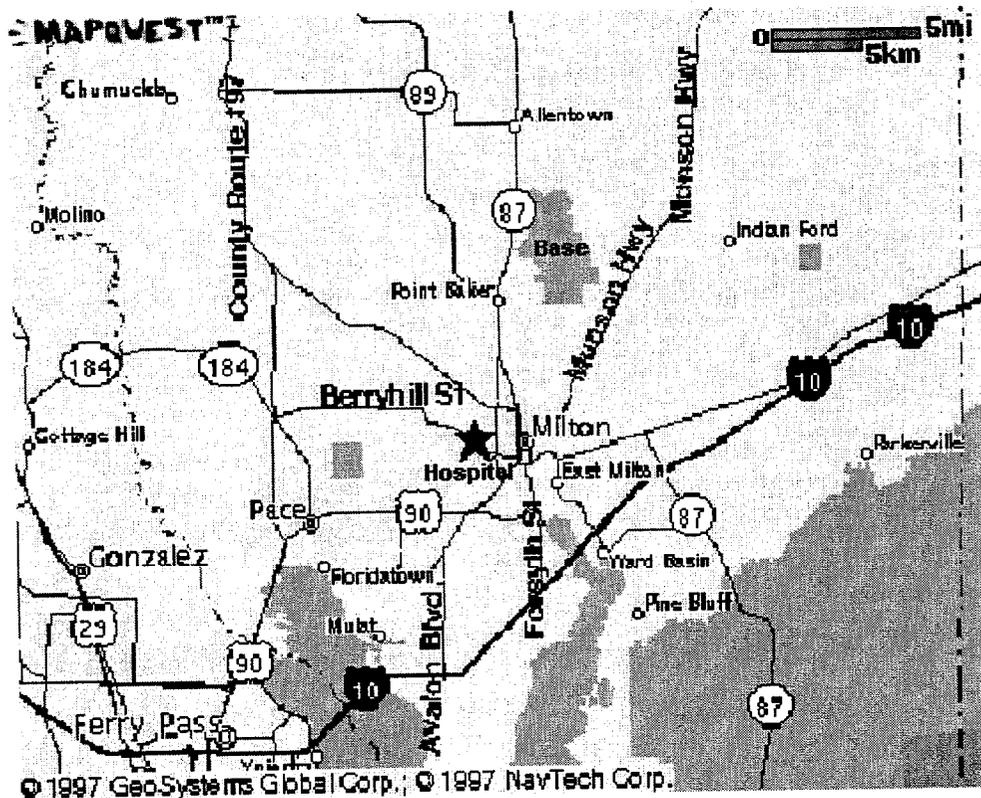
Directions to West Florida Regional Medical Center (Alternate)

The alternate source of medical assistance is West Regional Medical Center. Directions to this hospital are:

Travel 1 mile west from the base on Highway 87A, turn left. Drive 6 miles south on Highway 89 to Highway 90. Turn right and travel 13 miles to Davis Parkway (veer to the left). Travel 2.2 miles and the hospital is on the right side of the parkway. Exit Base onto Red Bank Road heading northwest. Take Snake River Road to Goose Creek Road. Turn left onto Goose Creek Road. Turn right on University Boulevard and follow to Medical Center. Take directions to Columbia Trident Medical Center. Exit onto I-26 south from University Boulevard. Take I-26 south approximately 4 miles to the Speisbegger Road exit and follow signs to the hospital.

This information will be posted with maps in the field office and copies should be placed in a conspicuous location within each site vehicle for quick retrieval.

FIGURE 2-1
HOSPITAL ROUTE MAP
NAS WHITING FIELD
MILTON, FLORIDA



3.0 SITE BACKGROUND

3.1 SITE INFORMATION

NAS Whiting Field is located in Santa Rosa County, approximately 20 miles northeast of Pensacola, at Milton. The Air Station, which is divided into two areas, provides support and facilities for flight and academic training. The North Field is used for fixed wing training, while the South Field is used for helicopter flight instruction.

3.2 SITE HISTORY AND CURRENT OPERATIONS

The air station was commissioned in 1943 as a training facility and has since generated waste streams associated with the operation and maintenance of aircraft, pilot scenario training exercises, and facility maintenance activities. Prior to the establishment of hazardous waste management and recycling plans, most of these materials were disposed of onsite. Wastes were either placed in onsite disposal pits or in waste oil bowlers, which were often used for firefighting training.

The industrial operations at Whiting Field include the North Field, South Field, and Mid Field areas. The North Field of NAS Whiting provided Primary flight training until 1949. Jet training was then introduced and several types of fixed wing aircraft were used until 1983. Maintenance and repair of these aircraft included stripping, painting, washing, and engine upkeep. These activities generated stripping compounds, cleaning solvents, paint wastes, alkaline cleaners, detergents, oil, and hydraulic fluids. In the 1970's, NAS Whiting Field began to perform general aircraft maintenance duties for Air Wing Five, a unit stationed at Whiting. The types of waste generated include waste oil, mineral spirits, methyl ethyl ketone (MEK), isopropyl alcohol, mixed paint thinners, and aircraft cleaning solution.

Line maintenance on transient aircraft and the daily upkeep and maintenance of several assigned aircraft has been performed at the Mid Field Hanger since the 1940's. Operation and maintenance activities performed and the wastes generated at the Mid Field are similar to those generated at the North Field.

The South Field of NAS Whiting, provided aircraft flight training until the early 1970's. In 1972, fixed wing aircraft training was moved from the South Field to the North Field and helicopter training was initiated. Operation and maintenance activities performed on the helicopters were similar to those performed on fixed wing aircraft at the North Field. Wastes generated at the South Field were similar to those generated at the North Field.

In 1985, an initial site assessment was performed by Envirodyne Engineering which indicated that thousands of gallons of waste including paints, paint thinners, solvents, waste oils, gasoline, hydraulic fluids, aviation gasoline (AVGAS), tank bottom sludges, polychlorinated biphenyl (PCB) containing transformer fluids, and paint stripping wastewater were potentially dumped into onsite disposal areas. Additional wastes were reportedly released as a result of accidents or equipment failure. The assessment identified 16 disposal and/or spill areas located on the facility property. In November of 1985, Geraghty & Miller was tasked by the Navy to prepare a Work Plan for a Verification Study addressing all of the sites. The Florida Department of Environmental Regulation reviewed the plan in December 1985 and discussions between involved parties led to the inclusion of two additional sites. These sites (17 & 18) contained waste oils and fuels burned in firefighting training exercises.

The results of the Verification Study indicated that groundwater contamination was present at some of the sites. A recommendation was made for additional study to determine the nature and extent of contamination at sites where groundwater contamination was identified. Phase IIA and Phase IIB RI/FS Field Investigations were performed in the early to mid-1990's.

3.3 INVESTIGATION AREAS

To define the limits of soil and groundwater contamination, investigation activities will potentially be required at several sites at NAS Whiting Field. Investigation activities will be performed at the sites listed in the following sections.

3.3.1 Phase IIC RI/FS Investigation

During this investigation, B&R Environmental will conduct surface and subsurface soil sampling at Sites 3, 4, 30, 32, and 33 and groundwater sampling at Sites 3, 4, and 32.

At Site 30 (South Field Maintenance Hanger), Site 32 (North Field Maintenance Hanger), and Site 33 (Mid Field Maintenance Hanger) the investigation will include sampling activities in the areas of potential abandoned underground waste oil tanks and areas of solvent contamination.

Sites 3 and 4 located adjacent to the North Field of NAS will also be investigated. These sites are the Underground Waste Solvent Storage Area (tank) and the North AVGAS Tank Sludge Disposal area respectively. Contamination at Site 3 includes waste solvents and paint thinners, while petroleum hydrocarbons and tank bottom sludge containing tetraethyl lead is present at Site 4.

3.3.2 Additional Investigations

As additional investigation activities are planned for other sites at NAS Whiting Field they will be described in this and succeeding sections.

4.0 SCOPE OF WORK

This section describes the project tasks that will be performed at NAS Whiting Field during field investigations activities. Additionally, each task has been evaluated and the associated hazards and recommended control measures are listed in Table 5-1 of this HASP. The planned activities involved in this effort are presented in detail in the Work Plan developed for the project. If new tasks are to be performed at the site, Table 5-1 and this section will be modified accordingly.

Tasks to be conducted during field investigation activities may include, but are not necessarily limited to, the following:

- Soil borings and monitoring well installation (geoprobe, hollow-stem augers, and mud rotary methods)
- Surface and subsurface soil sampling
- Monitoring well development and purging
- Groundwater sampling
- Mobilization/demobilization activities
- Decontamination of sampling and heavy equipment
- IDW management
- Surveying

4.1 PHASE IIC RI/FS INVESTIGATION

Field investigations to be performed by B&R Environmental during the Phase IIC RI/FS Investigation are designed to characterize the soil at Sites 3, 4, 30, 32 and 33 and the groundwater at Sites 3, 4, and 32.

The field investigation includes the installation of monitoring wells at approximately 16 locations at Sites 3, 4, and 32 to collect groundwater samples. The number of monitoring wells at each site is identified in Section 3.0 of the Work Plan. The monitoring wells will be installed using hollow-stem augers and mud-rotary drilling methods. Numerous soil borings will also be installed at Sites 3, 4, 30, 32, and 33. The soil borings to be installed are also described in Section 3.0 of the Work Plan. The specific tasks to be performed at each site during the Phase IIC investigation are shown in Table 4-1.

**TABLE 4-1
SITE ACTIVITY SUMMARY**

Activity	Site 3	Site 4	Site 30	Site 32	Site 33
Mobilization/Demobilization	X	X	X	X	X
Soil Boring Installation	X	X	X	X	X
Monitoring Well Installation	X	X		X	
Monitoring Well Purging and Development	X	X		X	
Groundwater Sampling	X	X		X	
Surface and Subsurface Soil Sampling	X	X	X	X	X
Decontamination of Sampling and Heavy Equipment	X	X	X	X	X
IDW Management	X	X	X	X	X
Surveying	X	X	X	X	X

4.2 ADDITIONAL INVESTIGATIONS

As additional investigation activities are planned for other sites at NAS Whiting Field they will be described in this and succeeding sections.

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION

Table 5-1 of this section serves as one of the primary portions of the site specific HASP. This table is intended to assist project personnel in the recognition of hazards and recommended procedures necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on appropriate air monitoring techniques and site-specific conditions. The evaluation of each task provides detailed information including anticipated hazards, recommended control measures, hazard monitoring recommendations, required Personal Protective Equipment (PPE), and decontamination measures. This table must be updated if the scope of work, contaminants of concern, or pertinent conditions change.

Table 5-1 nor the HASP are meant to be stand alone documents and must be accompanied by the Brown & Root Environmental Health and Safety Guidance Manual. This manual is designed to further explain supporting elements for any site specific operations as required by 29 CFR 1910.120. The Guidance Manual should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of B&R Environmental's SOPs are also provided in the Guidance Manual.

5.1 PHASE IIC RI/FS INVESTIGATION

Data available from previous investigative activities have been analyzed to identify substances that are the principal contaminants of concern at each of the site areas that will be included in the scope of work. These contaminants include substances that represent a potential for exposure to site personnel performing the work. Table 5-2 presents the contaminants of concern and air monitoring action levels for each of the site areas where work will be performed.

5.2 ADDITIONAL INVESTIGATIONS

As additional investigation activities are planned for other sites at NAS Whiting Field site specific contaminants of concern and air monitoring action levels will be described in this and succeeding sections.

TABLE 5-1

TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM
NAS WHITING FIELD, MILTON, FLORIDA
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Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
<p>Soil borings and/or monitoring wells installation. (mud rotary, hollow-stem augers, and geoprobe methods)</p>	<p><i>Chemical Hazards</i></p> <p>1) Chemical hazards vary by site areas (see Table 5-2 for site specific contaminants of concern). In general, inhalation hazard potentials may exist with regard to gas/vapor substances. Particulate inhalation hazard potentials are not significant. General contaminants of concern associated with the sites include solvents used in aircraft and auto maintenance, fuels, fuel oils, chlorinated solvents and various pesticides and metals. Detailed information on the properties of the contaminants of concern is included in Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><i>Physical hazards</i></p> <p>3) Pinch/compression points</p> <p>4) Noise</p> <p>5) Energized systems</p> <p>6) Lifting</p> <p>7) Biological Hazards</p>	<p>1) Observe real-time monitoring instrumentation Action Levels specified in Table 5-2. Use dust suppression methods such as area wetting as a precaution to minimize airborne particulate concerns, and use identified PPE to minimize potentials for worker exposures. Also, observe work practices/restrictions and decontamination procedures specified in this Health and Safety Plan.</p> <p>2) Decontaminate all equipment and supplies between boreholes and prior to leaving the site.</p> <p>3) All equipment to be used will be</p> <ul style="list-style-type: none"> - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600, 601, 602), and manufacturers design and documented as such using the Equipment Record Sheet (See Section 10.0 of the B&R Environmental health and Safety Guidance Manual). - Operated by Certified operators, and knowledgeable ground crew. - Used within establish safe zones and routes of approach - Only manufacturer approved equipment may be used in conjunction with equipment repair procedures (i.e. pins, etc.). <p>In addition, to equipment considerations the following safe operating procedures will be incorporated:</p> <ul style="list-style-type: none"> - All personnel not directly supporting the subsurface investigation will remain at least 15 feet from the point of operation. - Hydraulic masts or other projecting devices shall be at least 20 feet from overhead power lines unless they are shielded and a minimum of 3 feet from underground utilities unless the exact location of the underground utility is known. - Work areas will be kept clear of clutter. - Secure all loose articles, PPE and clothing to avoid possible entanglement. - All equipment shall be equipped with movement warning systems. - All personnel working in high equipment traffic areas are required to wear reflective vests for high visibility. - The driller and helper can simultaneously handle moving augers or flights only when there is a stand by person to activate the emergency stop device. - The driller must never leave the controls while tools are rotating unless all personnel are clear of rotating equipment. - A long handled shovel or equivalent shall be used to clear away drill cuttings from the hole and rotating equipment. Hands or feet shall not be used for this purpose. - A remote sampling device must be used to sample drill cuttings near rotating tools. The equipment operator shall shutdown machinery if the sampler is near the auger or probe. - Climbing the drill mast while equipment is rotating is prohibited. - Use ANSI approved fall protection (i.e., belts, lanyards and a fall protection slide rail) or portable ladders which meet OSHA requirements when climbing drill masts. - All personnel will be instructed in the location and operations of the emergency shut off device(s). This device will be tested initially (and then periodically) to insure its operational status. - Areas will be inspected prior to the movement of the drill rig and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSC. - The drilling and support vehicles will be moved no closer than 3 feet to banks, ditches, and other excavations unless the sidewalls are supported. <p>4) Hearing protection will be used if noise levels are excessive (see Hazard Monitoring column).</p> <p>5) All utility clearances shall be obtained prior to subsurface activities. Prior to any subsurface investigations, the locations of all underground utilities will be identified and marked. Obtain written permit clearance prior to all subsurface investigations.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>7) Avoid nesting areas, employ repellents (DO NOT use repellents during sampling activities). Report potential hazards to the SSO.</p>	<p>NOTE: Specific air monitoring instrument Action Levels are presented for each site area in Table 5-2. These will be observed for all site work.</p> <p>Use of either a Photoionization Detector w/ 10.2 eV strength probe or a Flameionization Detector will be required during all intrusive activities on site. Instrument use will be as follows:</p> <p>1) Source monitoring (at the borehole or geoprobe point of entry) will be conducted at regular intervals determined by the SSO.</p> <p>2) If positive sustained (above background) results are noted at the source monitoring location, monitor the breathing zone areas of employees. Any sustained reading above the Action Levels specified in Table 5-2 in the worker breathing zone areas will require evacuation of all personnel to a safe area (i.e., a location where readings are at background levels). Work can continue only when instrument readings in the breathing zone areas are below specified Action Levels or at elevated levels of PPE.</p> <p>At some sites, elevated instrument Action Levels may be used if it can be determined that certain substances are absent. For example, at some sites higher Action Levels can be used if it can be shown that benzene or naphthalene is not present. This can be accomplished using colorimetric grab sampling. Contact Health and Safety for additional direction.</p> <p>3) Where the utility clearance cannot be obtained in a reasonable period, or not located, drilling shall proceed with extreme caution using a magnetometer for periodic downhole surveys every 2 feet to a depth of at least 6 feet.</p> <p>4) As a general rule of thumb, if workers standing within 2 feet of each other must raise their voice in order to communicate, noise levels are excessive and hearing protection will be required. The SSO may perform noise dosimetry to determine actual noise exposures.</p>	<p>All subsurface operations are to be initiated in level D protection. Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"> - Standard field dress (Long pants Long Sleeve Shirts - Steel toe/shank safety shoes <p>These following items will be incorporated during subsurface operations:</p> <ul style="list-style-type: none"> - Surgeon's style inner gloves - Nitrile outer gloves - Hard hat, safety glasses, impermeable boot covers, and earplugs or muffs. - Tyvek coveralls will be worn if there is a possibility of soiling work attire - PVC or PE coated Tyvek will be incorporated if there is a potential for saturation of work attire. (Items in italics are optional as conditions dictate) <p>If engineering controls utilized are insufficient to reduce elevated monitoring instrument readings below specified Action Levels, work will stop and personnel will retreat to an unaffected area. Elevating to Level C may be appropriate if breathing zone readings do not return to less than specified Action Levels.</p> <p>PPE may be upgraded to Level C at each of the sites, protection upgrade may be done based on monitoring instrument results. Level C will consist of:</p> <ul style="list-style-type: none"> - Air Purifying Respirator (APR) with appropriate GMC-H cartridges for elevated concentrations not exceeding Action Levels specified in Table 5-2, for the following conditions: <ul style="list-style-type: none"> - positive benzene confirmation greater than background (Not to exceed 10 ppm). - observation of airborne dusts that cannot be controlled through area wetting methods <p>Chemical protective clothing for Level C will consist of impermeable boot covers, nitrile outer gloves, surgeon's-style inner gloves, and Tyvek coveralls. If free phase product or splash potentials exist, PVC or PE coveralls will be used in place of Tyvek.</p> <p>Level B protection</p> <p>Self-Contained Breathing Apparatus (SCBA), or airline respiratory protection will be required if:</p> <ul style="list-style-type: none"> - Instrument Action Levels are consistently above 25 ppm in worker breathing zone areas - positive benzene confirmation over 10 ppm. <p>Chemical protective clothing will consist of impermeable boot covers, surgeon's style inner gloves, nitrile outer gloves, Tyvek coveralls. If free phase product is encountered or splash potential exist, PVC or PE splash suit will be used in place of Tyvek.</p> <p>Ascension to Level B protection requires the immediate notification of the Project Manager, and Health and Safety Manager.</p> <p>As contaminant concentrations and conditions may change radically the following equipment will be maintained during all onsite activities</p> <ul style="list-style-type: none"> • Fire Extinguishers (Strategically placed) • Basket stretcher, blankets, and first-aid kit 	<p>Personnel Decontamination - Will consist of a soap/water wash and rinse for outer protective equipment (e.g. boots, gloves, PVC splash suits, etc.).</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer boots and outer gloves - Hard hat removal - Soap/water wash and rinse of the outer splash suit, as applicable - Wash hands and face, leave contamination reduction zone <p>For Levels C & B:</p> <p>Equipment drop</p> <ul style="list-style-type: none"> - Soap/water wash and rinse of outer boots and outer gloves - Hard hat removal - Soap/water wash and rinse of the outer splash suit, as applicable - SCBA air tank or APR cartridge change out would take place at this point. - Wash hands and face, leave contamination reduction zone - Outer suit, boot covers, outer glove removal - Respiratory (face mask) protection removal - Wash hands and face, leave contamination reduction zone <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as geoprobe, will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will be restricted access to exclusion zones, or also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site. The FOL or the SSO will be responsible for evaluating equipment arriving onsite and that which is to leave the site. No equipment will be authorized access or exit without this authorization.</p> <p>Evaluation will consist of</p> <ul style="list-style-type: none"> - Visual inspection - Scanning equipment with monitoring instruments

TABLE 5-1

TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM
 NAS WHITING FIELD, MILTON, FLORIDA
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Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
<p>Multi-media sampling including soils (surface, subsurface); groundwater, and General Field Data Collection</p>	<p><i>Chemical Hazards</i></p> <p>1) Chemical hazards vary by site areas (see Table 5-2 for site specific contaminants of concern). In general, inhalation hazard potentials may exist with regard to gas/vapor substances. Particulate inhalation hazard potentials are not significant. General contaminants of concern associated with the sites include solvents used in aircraft and auto maintenance, fuels, fuel oils, chlorinated solvents and various pesticides and metals. Detailed information on the properties of the contaminants of concern is included in Table 6-1.</p> <p>2) Transfer of contamination into clean areas</p> <p><i>Physical hazards</i></p> <p>3) Noise 4) Lifting (muscle strains and pulls) 5) Pinches and compressions 6) Slip, trips, and falls 7) Biological hazards (Insect/animal bites and stings)</p>	<p>1) Employ real-time monitoring instrumentation and observe site Action Levels specified in Table 5-2, and identified PPE to control exposures to potentially contaminated media (e.g. air, water, soils).</p> <p>2) Decontaminate all equipment and supplies between sampling locations and prior to leaving the site.</p> <p>3) When sampling at the drill rig employ hearing protection as indicated for that task. The use of hearing protection to protect against excessive noise outside of 25 feet from the point of operations should be incorporated under the following condition:</p> <p>Hearing protection during sampling outside of the boring sample will be determine on a case by case scenario. As a general rule of thumb, if you have to raise your voice to talk to someone who is within 2 feet of your location, noise levels may be excessive and hearing protection should be used.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>5) Use pinch bars or other equipment to keep hands out of machine point of operation areas.</p> <p>6) Preview work locations for unstable/uneven terrain. Barricade all excavations and other associated drop off points at least 3 feet from the edge.</p> <p>7) Avoid nesting areas, employ repellents. Report potential hazards to the SSO.</p>	<p>Monitoring instrumentation will be used as specified in Table 5-2.</p> <p>Subsurface soils monitoring direction and Action Levels will proceed in the following manner.</p> <p>Photoionization Detector w/ 10.2 eV UV lamp source or flameionization detector (FID)</p> <p>- Source monitoring will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source location (boreholes, well heads, MacroCore Samplers) which may impact operations crew will require the following actions:</p> <p>If positive sustained (above background) results are noted at the source monitoring location, monitor the breathing zone areas of employees. Any sustained reading above the Action Levels specified in Table 5-2 in the worker breathing zone areas will require evacuation of all personnel to a safe area (i.e., a location where readings are at background levels). Work can continue only when instrument readings in the breathing zone areas are below specified Action Levels or at elevated levels of PPE.</p>	<p>Level D protection will be utilized for the initiation of all sampling activities.</p> <p>Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"> - Standard field dress (Long pants Long Sleeve Shirts - Steel toe/shank safety shoes <p>These following items will be incorporated during sampling operations:</p> <ul style="list-style-type: none"> - Inner nitrile surgeons gloves, layered if necessary - <i>Hard hat, safety glasses, impermeable boot covers, and earplugs or muffs.</i> - Tyvek coveralls - <i>PVC or PE coated Tyvek will be incorporated if there is a potential for saturation of work attire. (Items in italics are optional as conditions dictate or as directed by the FOL or SSO)</i> <p>If engineering controls utilized are insufficient to reduce elevated monitoring instrument readings below specified Action Levels, work will stop and personnel will retreat to an unaffected area. Elevating to Level C may be appropriate if breathing zone readings do not return to less than specified Action Levels.</p> <p>PPE may be upgraded to Level C at each of the sites, protection upgrade may be done based on monitoring instrument results. Level C will consist of the following:</p> <ul style="list-style-type: none"> - Air Purifying Respirator (APR) with appropriate GMC-H cartridges for elevated concentrations not exceeding Action Levels specified in Table 5-2, for the following conditions: - positive benzene confirmation greater than background (Not to exceed 10 ppm). - observation of airborne dusts that cannot be controlled through area wetting methods <p>Chemical protective clothing for Level C will consist of impermeable boot covers, nitrile outer gloves, surgeon's-style inner gloves, and Tyvek coveralls. If free phase product or splash potentials exist, PVC or PE coveralls will be used in place of Tyvek.</p> <p>Level B protection Self-Contained Breathing Apparatus (SCBA), or airline respiratory protection will be required if:</p> <ul style="list-style-type: none"> - Instrument Action Levels are consistently above 25 ppm in worker breathing zone areas - positive benzene confirmation over 10 ppm. <p>Chemical protective clothing will consist of impermeable boot covers, surgeon's style inner gloves, nitrile outer gloves, Tyvek coveralls. If free phase product is encountered or splash potential exist, PVC or PE splash suit will be used in place of Tyvek.</p> <p>Ascension to Level B protection requires the immediate notification of the Project Manager, and Health and Safety Manager.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for outer protective equipment (e.g. boots, gloves, PVC splash suits, etc.). This function will take place at a satellite location. Disposable PPE will be bagged between sampling events. This procedure will consist of</p> <ul style="list-style-type: none"> - Sample acquisition - Clean (Deionized water spray) the outside of the sample containers/label/bag <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer boots and outer gloves - Hard hat removal - Soap/water wash and rinse of the outer splash suit, as applicable - Wash hands and face, leave contamination reduction zone <p>For Levels C & B:</p> <p>Equipment drop</p> <ul style="list-style-type: none"> - Soap/water wash and rinse of outer boots and outer gloves - Hard hat removal - Soap/water wash and rinse of the outer splash suit, as applicable - SCBA air tank or APR cartridge change out would take place at this point. - Wash hands and face, leave contamination reduction zone - Outer suit, boot covers, outer glove removal - Respiratory (face mask) protection removal - Wash hands and face, leave contamination reduction zone <ul style="list-style-type: none"> - Pack and ice sample transport container

TABLE 5-1

TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM
 NAS WHITING FIELD, MILTON, FLORIDA
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Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
Mobilization/ Demobilization	<p><i>Physical Hazards</i></p> <ol style="list-style-type: none"> 1) Lifting (muscle strains and pulls) 2) Pinches and compressions 3) Slip, trips, and falls 4) Moving machinery 5) Biological hazards (Insect/animal bites and stings) 6) Vehicular and foot traffic 	<ol style="list-style-type: none"> 1) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. 2) Use pinch bars or other equipment if caught in the machine point of operation. 3) Preview work locations for unstable/uneven terrain. Barricade all excavations from access closer than two feet from the edge. 4) All equipment will be <ul style="list-style-type: none"> - Inspected in accordance with OSHA, and manufacturers design. - Operated by Certified operators, and knowledgeable ground crew. 5) Avoid nesting areas, use repellents (Do NOT use repellents during sampling activities). Report potential hazards to the SSO. 6) Traffic and equipment considerations are to include the following; <ul style="list-style-type: none"> - Establish safe zones of approach (i.e. Boom + 3 feet). - Secure all loose articles to avoid possible entanglement. - All equipment shall be equipped with movement warning systems - Employ safety belts and follow the traffic rules. <p>Traffic patterns will be dictated supporting onsite activities. However, regulated patterns in and about the work zones and support thereof will be established to safely control moving equipment, vehicles, and pedestrians around the area of operation.</p>	Not required	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Safety glasses - <i>Hard hat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i> <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></p>	Not required
Decontamination of Sampling and Heavy Equipment	<p><i>Chemical Hazards</i></p> <ol style="list-style-type: none"> 1) Minor exposure potentials for air/particulate/water borne contaminant See Table 5-2 2) Decontamination fluids - Liquinox (detergent), acetone or methanol, and hexane <p><i>Physical Hazards</i></p> <ol style="list-style-type: none"> 3) Lifting (muscle strains and pulls) 4) Pinches and compressions 5) Noise 	<ol style="list-style-type: none"> 1) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. 2) Obtain manufacturer's MSDS for any decontamination solvents used onsite. Users of solvents must review the MSDS and have ready access to it on site. Maintain a Chemical Inventory and a file of MSDS for all hazardous chemicals brought to the site. Users must observe MSDS requirements with regard to chemical use, storage, spill response, PPE, and other aspects. 3) Use multiple persons where necessary for lifting and handling sampling equipment for decontamination purposes. 4) Place or stack equipment securely during decontamination and air drying to prevent unstable items from falling. 5) Steam/pressure washer operators will wear hearing protection, other personnel will be restricted from the immediate area (i.e., no closer than 20 feet) to minimize their potentials for exposure to noise, overspray, and flying projectiles. 	<ol style="list-style-type: none"> 1) Use visual observation, and real-time monitoring instrumentation to ensure that all equipment has been properly cleaned. Observe instrument Action Levels specified in Table 5-2. 	<p><i>For Heavy Equipment:</i> This applies to high pressure soap/water, steam cleaning wash and rinse procedures.</p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Chemical resistant boot covers - Nitrile outer gloves - PVC Rainsuits or PE or PVC coated Tyvek - Safety glasses underneath a splash shield <p><i>For sampling equipment including trowels, MacroCore Samplers, bailers, etc. the following PPE is required</i></p> <p>Level D Minimum requirements -</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Nitrile outer gloves, cotton liners - Safety glasses underneath a splash shield - Ear plugs or ear muffs <p>In the event of overspray of chemical decontamination fluids employ PVC Rainsuits or PE or PVC coated Tyvek as necessary.</p>	<p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Remove splash shield and safety glasses - Remove ear muffs (if worn) - Soap/water wash and rinse of outer gloves and boot covers - Remove and dispose of gloves - Remove and dispose of coveralls - Remove boot covers - Wash hands and face - Remove ear plugs (if worn) - Leave contamination reduction zone

TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM
NAS WHITING FIELD, MILTON, FLORIDA
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Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
Monitoring well development and purging .	<p><i>Chemical Hazards</i></p> <p>1) Chemical hazards vary by site areas (see Table 5-2 for site specific contaminants of concern). In general, inhalation hazard potentials may exist with regard to gas/vapor substances. Particulate inhalation hazard potentials are not significant. General contaminants of concern associated with the sites include solvents used in aircraft and auto maintenance, fuels, fuel oils, chlorinated solvents and various pesticides and metals. Detailed information on the properties of the contaminants of concern is included in Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><i>Physical hazards</i></p> <p>3) Pinch/compression points</p> <p>4) Noise</p> <p>5) Energized systems</p>	<p>1) Observe real-time monitoring instrumentation Action Levels specified in Table 5-2. Use dust suppression methods such as area wetting as a precaution to minimize airborne particulate concerns, and use identified PPE to minimize potentials for worker exposures. Also, observe work practices/restrictions and decontamination procedures specified in this Health and Safety Plan.</p> <p>2) Decontaminate all equipment and supplies between well locations and prior to leaving the site.</p> <p>3) All equipment to be used will be</p> <ul style="list-style-type: none"> - Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600, 601, 602), and manufacturers design. - Operated by Certified operators, and knowledgeable ground crew. - Used within establish safe zones and routes of approach - Only manufacturer approved equipment may be used in conjunction with equipment repair procedures (i.e. pins, etc.). <p>In addition, to equipment considerations the following safe operating procedures will be incorporated:</p> <ul style="list-style-type: none"> - All personnel not directly supporting the subsurface investigation will remain at least 15 feet from the point of operation. - If the drill rig is still in place during this task, ensure that the hydraulic masts or other projecting devices are at least 20 feet from overhead power lines and a minimum of 3 feet from underground utilities. - Work areas will be kept clear of clutter. - Secure all loose articles to avoid possible entanglement. - All equipment shall be equipped with movement warning systems. - All personnel working in high equipment traffic areas are required to wear reflective vests for high visibility. - All personnel will be instructed in the location and operations of the emergency shut off device(s). This device will be tested initially (and then periodically) to insure its operational status. - Areas will be inspected prior to the movement of the support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO. <p>4) Hearing protection may be required, at the discretion of the SSO. As a general rule of thumb, if personnel standing within 2 feet of each other must raise their voices to communicate, noise levels are probably excessive and hearing protection must be worn.</p> <p>5) All utility clearances shall be obtained prior to subsurface activities. Prior to any subsurface investigations, the locations of all underground utilities will be identified and marked. Obtain written permit clearance prior to all subsurface investigations.</p>	<p>Photoionization Detector w/ 10.2 eV UV lamp source, or a Flameionization Detector, will be used as follows:</p> <p>1) Source (borehole and geoprobe sampler) monitoring will be conducted at regular intervals determined by the SSO. Positive sustained (above background) results which may impact operations crew will require the following actions.</p> <p>2) Monitor the breathing zone of all employees. Any sustained reading above instrument Action Levels specified in Table 5-2 in worker breathing zone areas will require evacuation to a safe area. Work may resume only when levels are below the site Action Levels, or at an elevated level of protection.</p> <p>3) The SSO may perform noise dosimetry to determine worker exposures to noise.</p>	<p>All subsurface operations are to be initiated in level D protection.</p> <p>Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"> - Standard field dress (Long pants Long Sleeve Shirts - Steel toe/shank safety shoes <p>These following items will be incorporated during subsurface operations:</p> <ul style="list-style-type: none"> - Surgeon's-style inner gloves - Nitrile outer gloves - Hard hat, safety glasses, impermeable boot covers, and earplugs or muffs. - <i>Tyvek coveralls will be worn if there is a possibility of soiling work attire</i> - <i>PVC or PE coated Tyvek will be incorporated if there is a potential for saturation of work attire.</i> (Items in italics are optional as conditions dictate) <p>If engineering controls utilized are insufficient to reduce elevated background readings then PPE will be upgraded accordingly.</p> <p>Level C protection upgrade will be done based on monitoring instrument results. Level C will consist of the following:</p> <ul style="list-style-type: none"> - Air Purifying Respirator (APR) with appropriate GMC-H cartridges for elevated concentrations not exceeding Action Levels specified in Table 5-2. <p>Level C will not be used in atmospheres where monitoring instrument readings are greater than Action Levels specified in Table 5-2.</p> <p>Chemical protective clothing for Level C will consist of the same articles specified above for Level D for subsurface operations.</p> <p>The potential need to use Level B protection is not anticipated for this task. However, if instrument Action Levels indicate that Level C is inadequate, work may be authorized to proceed using Level B. PPE requirements for Level B will include the use of a Self-Contained Breathing Apparatus (SCBA), or airline respiratory protection, in conjunction with the same items of physical and dermal PPE as that specified above for Level C - subsurface operations.</p> <p>Ascension to Level B protection requires immediate notification of the PM, and Health and Safety Manager (Pgh Office)</p>	<p>Personnel Decontamination - Will consist of a soap/water wash and rinse for outer protective equipment (e.g. boots, gloves, PVC splash suits, etc.).</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"> - Equipment drop - Hard hat and safety glasses removal - Soap/water wash and rinse of outer boots and outer gloves - Soap/water wash and rinse of the outer splash suit, as applicable - Remove outer gloves, dispose - If respiratory protection is worn, it will be removed at this point - Remove coveralls (if worn), dispose - Remove boot covers - Remove inner gloves, dispose - Wash hands and face, leave contamination reduction zone <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment such as geoprobe, will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will be restricted access to exclusion zones, or also have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving onsite and that which is to leave the site. No equipment will be authorized access or exit without this authorization.</p> <p>This evaluation will consist of:</p> <ul style="list-style-type: none"> - Visual inspection - Scanning equipment with monitoring instruments

TABLE 5-1

TASKS/HAZARDS/CONTROL MEASURES COMPENDIUM
 NAS WHITING FIELD, MILTON, FLORIDA
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Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment	Decontamination Procedures
IDW management and moving IDW drums to storage areas	<p><i>Chemical Hazards</i></p> <p>1) Chemical hazards vary by site areas (see Table 5-2 for site specific contaminants of concern). Potential exposures to these substances are less of a concern in this task as compared to the activities performed that generated the IDW. However, When handling open containers of IDW inhalation hazard potentials may exist with regard to gas/vapor substances. Particulate inhalation hazard potentials are not significant. General contaminants of concern associated with the sites include solvents used in aircraft and auto maintenance, fuels, fuel oils, chlorinated solvents and various pesticides and metals. Detailed information on the properties of the contaminants of concern is included in Table 6-1.</p> <p>2) Transfer of contamination into clean areas</p> <p><i>Physical hazards</i></p> <p>3) Noise 4) Lifting (muscle strains and pulls) 5) Pinches and compressions 6) Slip, trips, and falls 7) Biological hazards (Insect/animal bites and stings)</p>	<p>1) Observe real-time monitoring instrumentation Action Levels specified in Table 5-2. and use identified PPE to minimize potentials for worker exposures. Also, observe work practices/restrictions and decontamination procedures specified in this Health and Safety Plan.</p> <p>2) IDW storage areas where containers of liquid IDW may be placed should be constructed with an impermeable barrier and bermed sides, and be large enough to contain the entire contents of the largest container that may be placed there (i.e., the contents of one 55-gallon drum). Equipment used in this task must be decontaminated between locations and prior to leaving the site.</p> <p>3) When using heavy equipment to move IDW drums employ hearing protection. Hearing protection should be used to protect against excessive noise if workers standing within 2 feet of each other need to raise their voices in order to communicate.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>5) Use pinch bars or other equipment to remove hands from the point of operation.</p> <p>6) Preview work locations for unstable/uneven terrain. Barricade all excavations and other associated drop off points at least 3 feet from the edge.</p> <p>7) Avoid nesting areas. employ repellents. Report potential hazards to the SSO.</p>	<p>Excessive chemical contaminant concentrations impacting field crews during this task is not anticipated. The following information is based on a contingency action only.</p> <p>Monitoring instrumentation will be employed as specified by the SSO and/or FOL. A Photoionization Detector w/ 10.2 eV UV lamp source or flameionization detector (FID) will be utilized as needed.</p> <p>- Source monitoring will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source location (drums, storage areas, etc.) which may impact operations crew will require the following actions:</p> <p>1) Monitor the breathing zone of personnel. Any sustained reading above site Action Levels (as specified in Table 5-2) in the breathing zone requires that site activities will cease until acceptable levels are regained through allowing the area to ventilate or by using engineering controls.</p> <p>2) Based on environmental sampling, contaminant concentrations are not anticipated to reach the quantity to require Level C protection.</p>	<p>Level D protection will be utilized for the initiation of all IDW activities.</p> <p>Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"> - Standard field dress (Long pants Long Sleeve Shirts - Steel toe safety shoes <p>These following items will be incorporated during IDW operations:</p> <ul style="list-style-type: none"> - Inner nitrile surgeons gloves, layered if necessary - <i>Hard hat, safety glasses, impermeable boot covers, and earplugs or muffs.</i> - <i>Tyvek coveralls will be worn if there is a possibility of soiling work attire</i> - <i>PVC or PE coated Tyvek and boot covers will be incorporated if there is a potential for saturation of work attire.</i> <p><i>(Items in italics are optional as conditions dictate or as directed by the FOL or SSO)</i></p> <p>Excessive chemical contaminant concentrations impacting field crews during this task is not anticipated. The following information is based on a contingency action only.</p> <p>Level C protection upgrade will be done based on monitoring instrument results. Level C protection will consist of the following:</p> <ul style="list-style-type: none"> - Air-Purifying Respirator (APR) with GMC-H cartridges. <p>Chemical protective clothing will consist of impermeable boot covers, nitrile gloves with a cotton liner, Tyvek coveralls (unless free phase product is encountered). Free phase product or splash potential PVC or PE splash suit.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for outer protective equipment (e.g. boots, gloves, PVC splash suits, etc.). This function will take place at a satellite location. Disposable PPE will be bagged and placed in appropriate containers for disposal. Containers of IDW must be appropriately labeled, identifying their contents.</p> <p>The decontamination procedures for this task will consist of:</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer boots - Remove (and dispose of non-reusable) PPE - Wash hands and face, leave contamination reduction zone <p>For Levels C:</p> <ul style="list-style-type: none"> - Equipment drop - Soap/water wash and rinse of outer boots - Respirator removal or APR cartridge change out. - Outer suit, boot covers, outer glove removal - Respiratory (face mask) protection removal - Glove removal and disposal - Wash hands and face, leave contamination reduction zone
Surveying	<p><i>Physical Hazards</i></p> <p>1) Slip, trips, and falls 2) Biological hazards (Insect/animal bites and stings) 3) Vehicular and foot traffic 4) Ambient temperature extremes</p>	<p>1) Preview work locations for unstable/uneven terrain. Barricade all excavations from access closer than two feet from the edge.</p> <p>2) All equipment will be</p> <ul style="list-style-type: none"> - Inspected in accordance with OSHA, and manufacturers design. - Operated by Certified operators, and knowledgeable ground crew. <p>3) Avoid nesting areas, use repellents (Do NOT use repellents during sampling activities). Report potential hazards to the SSO.</p> <p>4) Wear appropriate clothing for weather conditions. Institute work/rest regimens in accordance with ACGIH guidelines. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is provided in Section 4 of the Brown & Root Environmental Health and Safety Guidance Manual.</p>	Not required	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"> - Standard field attire (Long sleeve shirt; long pants) - Safety shoes (Steel toe/shank) - Safety glasses - <i>Hard hat (when overhead hazards exists, or identified as a operation requirement)</i> - <i>Reflective vest for high traffic areas</i> - <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i> <p><i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i></p>	Decontamination not required for this task.

**TABLE 5-2
CONTAMINANTS OF CONCERN AND
MONITORING INSTRUMENT ACTION LEVELS
NAS WHITING FIELD, MILTON, FLORIDA**

Site	Contaminants of Concern	PID Probe Strength and Breathing Zone Action Levels	FID Action Levels
3	Acetone, benzene, ethylbenzene, toluene, trichloroethene, xylenes	10.2 eV probe 1 ppm 20 ppm if presence of benzene ruled out	0.8 ppm 15 ppm if presence of benzene ruled out
4	Benzene, ethylbenzene, toluene, xylenes	10.2 eV probe 1 ppm 25 ppm if presence of benzene ruled out	0.8 ppm 25 ppm if presence of benzene ruled out
30	Acetone, naphthalene, trichloroethene	10.2 eV probe 10 ppm	15 ppm if presence of naphthalene ruled out
32	Acetone, benzene, 1,2-dichloroethene, ethylbenzene, naphthalene, tetrachloroethylene, toluene, trichloroethene, xylenes	10.2 eV probe 1 ppm 10 ppm if presence of benzene ruled out	0.0 ppm 10 ppm if presence of benzene AND naphthalene ruled out
33	Ethylbenzene, trichloroethene	10.2 eV probe 20 ppm	15 ppm

Table 5-2 Notes:

- Action Levels specified are for sustained readings (one minute or longer) in the Breathing Zone above established background levels.
- Background levels are to be measured and documented at least at the beginning of each day, and more often if necessary (i.e., initiating work at a different site area or if ambient weather conditions change)
- 10.6 eV probe strength is an acceptable alternative to a 10.2 eV probe
- Based on analytical results from previous sampling efforts, particulate contaminants do not represent a remarkable concern. Examples of substances that have been detected at these sites include pesticides (i.e., chlordane, DDE, DDT), PNAs/PAHs (i.e., benzo[a] pyrene, and metals (such as lead and arsenic). As an added precaution, dust suppression controls shall be utilized to minimize concerns for inhalation of particulate contaminants.
- Benzene presence at Site 30 disregarded because it has been detected only in groundwater and current scope of work does not present potentials for encountering groundwater at this site. This will need to be reconsidered if scope of work is modified.
- To rule out benzene, SSO shall use Benzene 0.5/c Draeger tubes. This Draeger tube sampling will be required when sustained (one minute duration or longer) breathing zone readings are measured to be over 1 ppm above established background levels. This sampling can be performed without stopping work and in Level D, if the following four conditions are satisfied:
 - PID readings are not higher than 10 ppm in the breathing zone areas
 - This type of event does not occur more than twice on any single day
 - A single sampling event does not take longer than 20 minutes
 - The tube color change (from white to brownish-yellow) indicating benzene is NOT noted during the sampling
 If any of these four conditions are not satisfied, the SSO must contact the Health Sciences Dept. for additional guidance (412-921-8912).
- Colorimetric (Draeger) tubes for detection/measurement of naphthalene are not available. To rule out the presence of this substance, the H&S Dept. must be notified and perform air sampling. For this reason, the use of a PID is preferable over an FID at sites where naphthalene is a chemical of concern (Sites 30 and 32).

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical and physical hazards present at NAS Whiting Field and the activities conducted as part of this scope of work. Table 6-1 provides information related to chemical constituents that have been identified by analysis or are suspected to be present at the site based on historical data. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data are discussed in the table.

6.1 CHEMICAL HAZARDS

The potential health hazards at NAS Whiting Field include inhalation, ingestion, and dermal contact of various contaminants which may be present in shallow and deep soils as well as sediments and groundwater. As the focus of the proposed field investigations is to conduct additional sampling of various media at the associated sites, concentrations of the chemical hazards present are not fully determined. Based on prior activities at the sites however, there are several contaminants that are known to be present in elevated levels and other constituents which may be encountered. The following have been identified as the primary classes of hazards to be investigated:

- Metals
- Volatile Organic Compounds (VOCs)
- Semivolatile Organic Compounds (SVOC's)
- Polynuclear Aromatic Hydrocarbons (PAH's)
- Total Petroleum Hydrocarbons (TPH's)
- Pesticides
- Polychlorinated biphenyls (PCB's)

Unexploded Ordnance (UXO) are not suspected to be present based on the history of NAS Whiting Field.

Specific chemicals of concern for each of the site areas where work will be performed are shown in Table 5-2.

Table 6-1 provides information on the individual substances likely to be present at the sites of concern. Included is information on the toxicological, chemical, and physical properties of these substances. It is anticipated that the greatest potential for exposure to site contaminants is during intrusive activities (drilling, sampling, etc.). Metals and PCBs are anticipated to be bound to particulates. Exposure to these compounds is most likely to occur through ingestion of contaminated soil or water, or hand-to-mouth contact during soil disturbance activities. For this reason, PPE and basic hygiene practices (washing face

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Benzene	71-43-2	PID: I.P. 9.24 eV, 100% response with PID and 10.2 eV lamp. FID: 150% relative response ratio with FID.	Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol in accordance with OSHA 07 or NIOSH Method #1500.	OSHA: 1 ppm ACGIH: 10 ppm NIOSH: 0.1 ppm IDLH: 500 ppm	Inadequate - Odor threshold 34-199 ppm. The use of air-purifying respirators with organic vapor cartridge up to 10 ppm is acceptable despite the inadequate warning properties, providing cartridges are changed at the beginning of each shift. Recommended gloves: Butyl/neoprene blend - >8.00 hrs; Silver shield as a liner - >8.00 hrs; Viton - >8.00 hrs	Boiling Pt: 176°F; 80°C Melting Pt: 42°F; 5.5°C Solubility: 0.07% Flash Pt: 12°F; -11°C LEL/LFL: 1.3% UEL/UFL: 7.9% Vapor Density: 2.77 Vapor Pressure: 75 mmHg Specific Gravity: 0.88 Incompatibilities: Strong oxidizers, fluorides, perchlorates, and acids Appearance and Odor: Colorless to a light yellow liquid with an aromatic odor	Overexposure may result in irritation to the eyes, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea. Long duration exposures may result in respiratory collapse. Regulated as an OSHA carcinogen. May cause damage to the blood forming organs and may cause a form of cancer called leukemia.
Tetrachloroethene	79-34-5	PID: I.P. 11.1 eV, relative response ratio unknown. FID: 100% response with FID.	Air sample using charcoal tube; carbon disulfide desorption, GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #07, or NIOSH Method #1003.	OSHA: 5 ppm (skin) ACGIH; NIOSH: 1 ppm (skin) IDLH: 100 ppm	Odor threshold for this substance is 7.3 ppm. This level in comparison to the TLV is considered poor. Air purifying elements (organic vapor/acid gas) are recommended for escape purposes only. Combination units (APR/airline respirator) are recommended for working in concentrations in excess of the TLV. Recommended glove: Butyl rubber 4.6 hrs; solvent dipped, unsupported. PV alcohol >8.00 hrs; Teflon >15.20 hrs; Viton >8.00 hrs	Boiling Pt: 296°F; 147°C Melting Pt: -33 to -47°F; -36 to -43.8 °C Solubility: 0.3% Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: 9 mmHg @ 86°F; 30°C Specific Gravity: 1.59 @ 77°F; 25° C Incompatibilities: Strong oxidizers, alkalis, fuming sulfuric acid, and chemically active metals. When heated to decomposition temperatures will emit toxic fumes of chlorine. Appearance and Odor: Colorless to pale yellow liquid with a pungent chloroform like odor.	Overexposure may result in CNS effects including depression, sleepiness, hallucinations, distorted perceptions, tremors(fingers), and stupor (narcosis). Systemically, symptoms may result in nausea, vomiting, abdominal pains, and cramps. May also irritate the eyes, skin, and mucous membranes. Chronic exposures may result in dermatitis, enlarged tender liver, jaundice, hepatitis, kidney, and lung damage.

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TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Ethylbenzene	100-41-4	PID: 1.P 8.76, High response with PID and 10.2 eV lamp. FID: 100% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #07 or NIOSH Method #1501 Aromatic Hydrocarbon.	ACGIH; NIOSH: 100 ppm; 125 ppm STEL OSHA: 100 ppm IDLH: 800 ppm	Adequate - Can use air-purifying respirator with organic vapor cartridge up to 800 ppm. Recommended gloves: Neoprene or nitrile w/ silver shield when potential for saturation; Teflon >3.00 hrs	Boiling Pt: 277°F; 136°C Melting Pt: -139°F; -95°C Solubility: 0.01% Flash Pt: 55°F; 13°C LEL/LFL: 1.0% UEL/UFL: 6.7% Vapor Density: 3.66 Vapor Pressure: 10 mmHg @ 79°F; 26°C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with an aromatic odor. Odor Threshold of 0.092-0.60.	Regulated primarily because of its potential to irritate the eyes and respiratory system. In addition, effects of overexposure may include headaches, narcotic effects, CNS changes (i.e., coordination impairment, impaired reflexes, tremoring) difficulty in breathing, possible chemical pneumonia, and potentially respiratory failure or coma.
Diesel Fuel No.2-D	Mixture	Components of this substance will be detected readily however no documentation exists as to the relative response ratio of either PID or FID.	Air sample using charcoal tube as a collection media; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with NIOSH Method #1550.	OSHA; NIOSH; ACGIH: 5 mg/m ³ as mineral oil mist. In addition NIOSH and ACGIH establish 10 mg/m ³ as a STEL.	Kerosene odor Recommended Air Purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <170-400°F; 77-204°C Melting Pt: Not available Solubility: Negligible Flash Pt: 125°F; 52°C LEL/LFL: 0.6% UEL/UFL: 7.5% Vapor Density: >5 Vapor Pressure: <1 mmHg @ 70°F; 21°C Specific Gravity: 0.86 Incompatibilities: strong oxidizers, halogens, and hypochlorites Appearance and odor: Colorless to amber with a kerosene odor	Prolonged or repeated exposures to this product may cause skin and eye irritation. Due to the defatting capabilities this exposure may lead to a dermatitis condition. High vapor concentrations are irritating to the eyes and respiratory tract. Exposure to high airborne concentrations may result in narcotic effects including dizziness, headaches, and anesthetic to unconsciousness. High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
JP-4	N/A	Components of this substance will be detected readily however no documentation exists as to the relative response ratio of either the PID or FID.	Air sample using charcoal tube and carbon disulfide desorption; Sampling and analytical protocol shall proceed in accordance with NIOSH Method #1501.	USAF 8 hr - 200 ppm	Kerosene odor threshold ~ 800 ppm Rating - Poor to Adequate Recommended Air Purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <290-470°F; 143-243°C Melting Pt: Not available Solubility: Negligible Flash Pt: -10 to -50°F; -23 to -45°C LEL/LFL: <1% UEL/UFL: 8% Vapor Density: >1 Vapor Pressure: 75 mmHg; 70°F; 21°C Specific Gravity: 0.78 Incompatibilities: strong oxidizers Appearance and odor: Colorless to amber with a kerosene odor	Based on the constituents of jet fuels, it can be surmised that JP-4 is irritating to the eyes, skin, and respiratory tract. Direct contact may result in mild irritation with a possible drying and defatting of the skin. Ingestion may result in gastrointestinal irritation, nausea, and vomiting and may be harmful or even fatal. Inhalation of vapors or mists of JP-4 may result in headache, nausea, confusion, narcotic effect, and drowsiness. Chronic inhalation of jet fuel vapors may produce symptoms such as fatigue, anxiety, mood changes, liver and kidney damage, and memory difficulties in exposed workers.
Toluene	108-88-3	PID: I.P 8.82 eV, High response with PID and 10.2 eV lamp. FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption. Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1500.	OSHA: 200 ppm 300 ppm (Ceiling) ACGIH: 50 ppm (skin) NIOSH: 100 ppm 150 ppm STEL IDLH: 500 ppm	Adequate - Odor threshold 1.6 ppm is considered good. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm. Recommended gloves: Teflon >15.00 hrs; Viton >16.00 hrs; silver shield >6,00 hrs; supported nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection); PV alcohol >25.00 hrs	Boiling Pt: 232°F; 111°C Melting Pt: -139°F; -95°C Solubility: 0.05% (61°F; 16°C) Flash Pt: 40°F; 4°C LEL/LFL: 1.2% UEL/UFL: 7.1% Vapor Density: 3.14 Vapor Pressure: 20 mmHg @ 65°F; 18°C Specific Gravity: 0.87 Incompatibilities: Strong oxidizers Appearance and odor: Colorless liquid with a sweet pungent aromatic odor.	Overexposure to this substance may result in mild to moderate irritation at all points of contact, and CNS changes including euphoria, confusion, nervousness, and possibly paresthesia characterized by an abnormal burning sensation, pricking, or numbness. At 200-500 ppm exposure has resulted in headaches, nausea, eye irritation, loss of appetite, bad taste, impair coordination, fatigue, and weariness. Chronically, toluene overexposure may result in dermatitis, liver, and kidney damage.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Trichloroethene	79-01-6	PID: I.P. 9.45 eV, High response with PID and 10.2 eV lamp. FID: 70% Response with FID.	Air sample using charcoal tube; carbon disulfide desorption; Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1022 or #1003.	OSHA: 100 ppm; 200 ppm (Ceiling) ACGIH: 50 ppm; 100 ppm STEL NIOSH: As low as possible IDLH: 1000 ppm	Inadequate - Odor threshold 82 ppm. APRs with organic vapor/acid gas cartridges may be used for escape purposes. Exceedances over the exposure limits require the use of positive pressure-demand supplied air respirator. Recommended gloves: PV Alcohol unsupported >16.00 hrs; Silver shield >6.00 hrs; Teflon >24.00 hrs; or Viton >24.00 hrs; Nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection)	Boiling Pt: 188°F; 86.7°C Melting Pt: -99°F; -73°C Solubility: 0.1% @ 77°F; 25°C Flash Pt: 90°F; 32°C LEL/LFL: 8% @ 77°F; 25°C UEL/UFL: 10.5 @ 77°F; 25°C Vapor Density: 4.53 Vapor Pressure: 100 mmHg @ 90°F; 32°C Specific Gravity: 1.46 Incompatibilities: Strong caustics and alkalis, chemically active metals (barium, lithium, sodium, magnesium, titanium, and beryllium) Appearance and Odor: Colorless liquid with a chloroform type odor. Combustible liquid, however, burns with difficulty.	Central nervous system effects including euphoria, analgesia, anesthesia, paresthesia, headaches, tremors, vertigo, and somnolence. Damage to the liver, kidneys, heart, lungs, and skin have also been reported. Contact may result in irritation to the eyes, skin, and mucous membranes. Ingestion may result in GI disturbances including nausea, and vomiting. NIOSH lists this substance a potential human carcinogen.
Xylene All isomers o-, m-, p-	1330-20-7	PID: I.P. 8.56 eV, High response with PID and 10.2 eV lamp. FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA 07, or NIOSH Method 1500.	ACGIH, & NIOSH: 100 ppm, 150 ppm STEL OSHA: 100 ppm IDLH: 900 ppm	Adequate - Odor thresholds for the following isomers: 0.6 m-; 5.4 p-; 20 o- ppm. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations. Recommended gloves: PV Alcohol >12.67 hrs; Viton >8.00 hrs; CPE >1.00 hr; Butyl 0.87 hrs; Nitrile is acceptable for limited operations and contact (>0.20 hrs)	Boiling Pt: 269-281°F; 132-138°C Melting Pt: -130/-54m/56p°F; -25o/-48m/13p °C Solubility: 0.02 % Flash Pt: 81-90°F; 27-32°C LEL/LFL: 0.9% UEL/UFL: 7.0% Vapor Density: 3.66 Vapor Pressure: 7-9 mmHg @ 70°F; 21°C Specific Gravity: 0.86-0.88 Incompatibilities: Strong oxidizers and strong acids Appearance and odor: Colorless liquid with an aromatic odor.	Effects may of overexposure include irritation at all points of contact, CNS changes (i.e. dizziness, excitement, drowsiness, incoherent, staggering gait), difficulty in breathing, pulmonary edema, and possibly respiratory failure. Chronic effects may include dermatitis and cornea vacuolization.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Arsenic	7440-38-2	Particulate form - This substance is unable to be detected by PID/FID.	Air sample using a particulate filter; acid desorption; AAS detection. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #7900.	OSHA: Organic compounds 0.5 mg/m ³ Inorganic compounds 0.01 mg/m ³ NIOSH: (Ceiling) 0.002 mg/m ³ ACGIH: 0.2 mg/m ³ IDLH: 5 mg/m ³ as arsenic	No identifiable warning properties to indicate presence and thereby detection. Recommended APR Cartridge: Suitable for dust and fume. Organic vapor acid gases with HEPA filter. This substance may be presented as a pesticide, therefore a cartridge suitable for pesticides (MSA-GMP). Recommended Gloves: This is in the particulate form. Therefore any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances).	Boiling Pt: sublimation @ 1134°F; 612°C Melting Pt: 1497°F; 814°C @ 36 atm Solubility: Insoluble in water; soluble in nitric acid Flash Pt: Nonflammable, however, airborne in the form of a dust this substance will support combustion LEL/LFL: Nonflammable UEL/UFL: Nonflammable Vapor Density: Not available Vapor Pressure: 1 mmHg @ 372°C (sublimes) Specific Gravity: 5.73 Incompatibilities: Oxidizers, halogens, zinc, lithium, azides, and acetylides Appearance and odor: Gray to black, brittle, crystalline, amorphous, odorless.	Overexposure to this substance through inhalation or ingestion may result in ulceration of the nasal septum, GI disturbances resulting in violent purging and vomiting, hoarse voice, sore throat, excessive salivation, peripheral neuropathy (numbness and burning sensations beginning at the extremities followed by motor weakness), respiratory irritation leading to possible pulmonary edema. Skin or eye contact may result in irritation, conjunctiva, dermatitis, and hyperpigmentation (darkening of the areas exposed) of the skin. This substance has been judged to be a Human carcinogen by NTP, and IARC.
Lead	7439-92-1	Particulate form - Unable to be detected by either PID or FID.	Air sample using a mixed cellulose ester filter; or HNO ₃ or H ₂ O ₂ desorption; or Atomic absorption detection. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #7082 or #7300.	OSHA: 0.05 mg/m ³ ACGIH: 0.15 mg/m ³ NIOSH: 0.10 mg/m ³ IDLH: 100 mg/m ³ as lead	The use of a air purifying, full-face respirator with high efficiency particulate air filter for up to 2.5 mg/m ³ . Recommended gloves: This is in the particulate form. Therefore any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances).	Boiling Pt: 3164°F; 1740°C Melting Pt: 621°F; 327°C Solubility: Insoluble Flash Pt: Not applicable (Airborne dust may burn or explode when exposed to heat, flame, or incompatible chemicals) LEL/LFL: Not applicable UEL/UFL: Not applicable Vapor Density: Not available Vapor Pressure: 0 mmHg Specific Gravity: 11.34 Incompatibilities: Strong oxidizers, peroxides, sodium acetylide, zirconium, and acids Appearance and Odor: Metal: A heavy ductile, soft gray solid.	Overexposure to this substance via ingestion or inhalation may result in metallic taste in the mouth, dry throat, thirst, Gastrointestinal disorders (burning stomach pain, nausea, vomiting, possible diarrhea sometimes bloody or black, accompanied by severe bouts of colic), CNS effects (muscular weakness, pain, cramps, headaches, insomnia, depression, partial paralysis possibly coma and death. Extended exposure may result in damage to the kidneys, gingival lead line, brain, and anemia.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Chlordane	57-74-9	Substance is not volatile (VP=.00001 mmHg) I.P. is unknown, therefore detection by PID is unknown. Substance is non-combustible, therefore a FID is not expected to have a response to chlordane.	Air sample using Chromosorb-102 sorbent tube with mixed cellulose-ester filter or a xad-2 sorbent tube with filter. Toluene desorption and analysis by gas chromatography-electron capture detector. Sampling and analytical protocol will proceed in accordance with NIOSH Method #5510 or OSHA Method #67.	OSHA; NIOSH; ACGIH: 0.5 mg/m ³	Adequate - can use an air purifying respirator with an organic vapor & high efficiency air filter cartridges. Recommended gloves: PTFE Teflon for pure product. Nitrile acceptable for incidental contact.	Boiling Pt: 347°F; 175°C Melting Pt: Not available Solubility: Insoluble Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: 0.00001 mmHg Specific Gravity: 1.56 @ 60°F; 15.5 °C Incompatibilities: Strong oxidizers and alkaline reagents Appearance and Odor: Amber-colored, viscous liquid with a pungent, chlorine like odor.	Earliest signs of overexposure manifest as hypersensitivity of the central nervous system characterized by hyperactive reflexes, muscle twitching, tremors, incoordination, ataxia, and clonic convulsions. Cycles of excitement and depression may be repeated over and over. Chronic health hazard information similar to those for DDT.
DDT and the major metabolites; DDD and DDE.	50-29-3 72-54-8 72-55-9	Substance is not volatile, I.P. is unknown, detection by PID is unknown. Substance non-combustible, therefore a FID is anticipated to have reduced response to DDT.	Air sample using a binder free, glass fiber filter; isooctane desorption; gas chromatography-electron capture detector. Sampling and analytical protocol will proceed in accordance with NIOSH Method #3(S274).	OSHA; ACGIH: 1 mg/m ³ NIOSH: 0.5 mg/m ³	Adequate - Can use air purifying respirator with high efficiency particulate air filter (HEPA). Recommended glove: Nitrile acceptable for incidental contact.	Boiling Pt: 230°F; 110°C Melting Pt: 226°F; 108°C Solubility: Insoluble Flash Pt: 162-171°F; 72-77°C LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: Low Specific Gravity: 0.99 Incompatibilities: Strong oxidizers and alkalis Appearance and Odor: Colorless crystals or off-white powder with a slight aromatic odor	Large doses are followed by vomiting due to gastric irritation, diarrhea may follow. Numbness and paresthesias of the lips tongue and face associated with malaise, headache, sorethroat, fatigue and weakness. Coarse tremors (usually first of the neck, head, and eyelids). This may be accompanied by confusion, apprehension, and depression. Convulsions may result and death may occur from respiratory failure. DDT is absorbed and retained in the fat of humans. Chronic exposure may result in damage to the liver, kidneys and Peripheral Nervous System. DDT is recognized as possessing carcinogenic properties by IARC and NTP.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Aroclor-1260 (Polychlorinated Biphenyl, PCB) It should be noted that this substance is representative of the more common isomers Aroclor - 1242, 1254, which may be encountered.	11096-82-5 53469-21-9 (42%) 11097-69-1 (54%)	Substance is not volatile (VP=0.00006 mmHg), I.P. is unknown however is anticipated to be elevated, therefore, PID is not anticipated to detect this substance. Substance is non combustible and as a result will not be detected by FID.	Air sample using a particulate filter, Florisil sorbent tube with glass fiber filter; hexane desorption; gas chromatography-electron capture detector. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #5503 (PCBs).	OSHA; ACGIH: 0.5 mg/m ³ (skin) NIOSH: 0.001 mg/m ³ IDLH: 5 mg/m ³	Inadequate - However due to the low volatility it is assumed unless agitated this substance does not present a volatile vapor or gas respiratory threat. For dusty conditions where this material may cling to particulates, use a HEPA filter. APRs are approved for escape only when concentrations exceed the exposure limits. Concentrations greater than the exposure limits require PAPR or supplied air respirators. Recommended glove: Butyl rubber >24 hrs; Neoprene rubber >24.00 hrs; Silver shield or Viton (for pure product).	Boiling Pt: distillation range 689-734°F; 365-390°C Melting Pt: -2 to 50°F; -19 to 10°C Solubility: Insoluble Flash Pt: Not applicable LEL/LFL: Not applicable UEL/UFL: Not applicable Nonflammable liquid, however, exposure to fire results in black soot containing PCBs, dibenzofurans, & chlorinated dibenzo-p-dioxins Vapor Density: Not available Vapor Pressure: 0.00006 - 0.001 mmHg Specific Gravity: 1.566 @ 60°F; 15.5°C Incompatibilities: Strong oxidizers Appearance and Odor: Colorless to pale yellow, viscous liquid or solid (Aroclor 54 below 50° F) with a mild, hydrocarbon odor	This substance is irritating to the eyes and skin. Chronic effects of overexposure may include potential to cause liver damage, chloracne, and reproductive effects. Recognized as possessing carcinogenic properties by NIOSH, and NTP.
Bis(2-ethylhexyl) phthalate	117-81-7	No information found This is a combustible liquid therefore the FID should detect it however the relative response ratio is unknown.	Particulate filter; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with NIOSH Method #5020.	NIOSH; ACGIH: 5 mg/m ³ , STEL 10 mg/m ³ OSHA: 6 mg/m ³ IDLH: 5000 mg/m ³	Irritating, tingling sensation. Recommended APR Cartridge: Organic vapor acid gases with HEPA filter. Recommended gloves: Nitrile >6.00 hrs has been the one most widely used for the other substances and is acceptable for this substance. Other options include butyl rubber >8.00 hrs or neoprene >6.00 hrs	Boiling Pt: 680°F; 386°C Melting Pt: freezes 6.8°F; -14°C Solubility: Insoluble Flash Pt: 419°F; 215°C LEL/LFL: 0.3% @ 473°F; 245°C UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: <0.01 mm Specific Gravity: 0.99 Incompatibilities: Nitrates, strong oxidizers, acids, and caustics. Appearance and odor: Colorless, oily liquid, odorless	This substance is a mild skin, eye, mucous membrane irritant, and mild gastric disturbance. In test animals liver damage and teratogenic effects have been noted.

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**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Waste Oils All information is based on mineral oil	N.E. 8012-95-1 for mineral oil	Varies between fractions however waste oils tend to be less volatile. The FID tends to handle the longer chained aliphatic hydrocarbons more efficiently than its PID counterpart and would be selected as the instrument of choice.	Sampling and analytical protocol shall be in accordance with NIOSH Method #5026 is the recommended method for mineral oil mist.	ACGIH; NIOSH: 5 mg/m ³ (Oil mists); 10 mg/m ³ STEL OSHA: 5 mg/m ³ (Oil mists)	Non-volatile substance, therefore no respiratory protection is required. In an aerosol form dust and mist respirator would be considered acceptable for up to 500 mg/m ³ . Recommended gloves: Any glove suitable to prevent skin contact (Nitrile has been the one most widely used for the other substances, and will be acceptable).	Boiling Pt: 680°F; 360°C Melting Pt: Not available Solubility: Insoluble Flash Pt: 275-500°F; 135-260°C depends on the distillation fraction LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: <0.5 mmHg Specific Gravity: 0.90 Incompatibilities: None reported Appearance and odor: Colorless, oily, with an odor of burned lubricating oil.	Minor irritation to the eyes, skin, and respiratory system.
Acetone	67-64-1	PID: I.P. 9.69 eV, high response with PID and 10.2 eV lamp. FID: 60 % relative response ratio with FID.	Air sample using a charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA Method #69, 07 or NIOSH Method #1300.	OSHA: 1000 ppm ACGIH: 750 ppm, 1000 ppm STEL NIOSH: 250 ppm IDLH: 2500 ppm	Adequate - Can use air purifying respirator with organic vapor cartridge up to 2500 ppm. Recommended glove: Natural rubber	Boiling Pt: 133°F; 56°C Melting Pt: -139°F; -95°C Solubility: Miscible Flash Pt: 0°F; -18°C LEL/LFL: 2.5% UEL/UFL: 13% Vapor Density: Not available Vapor Pressure: 180 mmHg Specific Gravity: 0.79 Incompatibilities: Oxidizers, acids Appearance and odor: Colorless liquid with a fragrant mint-like odor.	Exposure to this chemical may result in irritation to the eyes, nose, throat. Overexposure may cause headache, dizziness. Contact with the skin may cause dermatitis. Target organs are listed as the respiratory system (lungs) and skin.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Methyl ethyl ketone (2-Butanone)	78-93-3	PID: I.P. 9.54 eV, high response with PID and 10.2 eV lamp. FID: 80% relative response ratio with FID.	Air sample using Ambersorb tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA Method #16, 84 or NIOSH Method #2500.	OSHA; 200 ppm NIOSH; 200 ppm STEL 300 ppm ACGIH: 200 ppm NIOSH; ACGIH: have established STEL of 300 ppm IDLH: 3000 PPM	Adequate - Can use air purifying respirator with organic vapor cartridges up to 2000 ppm. Recommended glove: Poly vinyl alcohol or natural rubber	Boiling Pt: 175°F; 79°C Melting Pt: -124°F; -86.4°C Solubility: 28% Flash Pt: 16°F; 9°C LEL/LFL: 1.4% UEL/UFL: 11.4% Vapor Density: 2.41 Vapor Pressure: 71 mmHg Specific Gravity: 0.81 Incompatibilities: Strong oxidizers, amines, ammonia, inorganic acids, caustics, copper, isocyanates, pyridines Appearance and odor: Colorless liquid with a moderately sharp, fragrant mint- or acetone like odor	Exposure may result in irritation to the eyes and nose. Overexposure may cause headache, dizziness, and vomiting. Target organs are the Central Nervous System and lungs.
Naphthalene	91-20-3	PID: I.P. 8.12 eV, relative response ratio unknown. No information was found as to the relative response for FID, however it is certain it is detectable at a high response.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #35 or NIOSH Method #1501.	OSHA; 10 ppm NIOSH; 10 ppm STEL 15 ppm ACGIH: 10 ppm NIOSH; ACGIH: have established a STEL of 15 ppm. IDLH: 250 ppm	Odor Threshold 0.038 ppm, Adequate - Use an air purifying respirator with organic vapors and dust/mists cartridges for concentrations up to 250 ppm. Recommended glove: Nitrile >6.00 hrs; Neoprene >6.00 hrs	Boiling Pt: 424°F; 218°C Melting Pt: 176°F; 80°C Solubility: 0.003% Flash Pt: 174°F; 79°C LEL/LFL: 0.9% UEL/UFL: 5.9% Vapor Density: Not available Vapor Pressure: 1 mmHg Specific Gravity: 1.15 Incompatibilities: Strong oxidizers, chromic anhydride Appearance and odor: Colorless to brown solid with and odor of mothballs	Overexposure to this substance may result in irritation to the eyes, headache, confusion, excitement, nausea, vomiting, abdominal pain, irritation of the bladder, profuse sweating, jaundice, blood in the urine, renal (kidney shutdown), and dermatitis. Prolonged or chronic exposure may further cause optical neuritis, and corneal damage. Target organs are listed as eyes, blood, liver, kidneys, skin, red blood cells, and central nervous system.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Heptachlor	76-44-8	PID: PID will not detect this substance. FID: FID will not detect this substance.	Sample using a Chrom-102 sorbent tube with toluene desorption. Analyze using Gas chromatography - electron capture detector in accordance with OSHA Method #S287.	OSHA: 0.5 mg/m ³ NIOSH: 0.5 mg/m ³ ACGIH: 0.05 mg/m ³ (skin)	An air purifying respirator equipped with a combination filter for organic vapors, pesticides, and High Efficiency Particulate Air (HEPA) filter is acceptable. Recommended glove: Nitrile or neoprene gloves are adequate for protection against contact with the skin.	Boiling Pt: 293°F; 145°C Melting Pt: 203°F; 95°C Solubility: 0.0006% Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Vapor Density: Not available Vapor Pressure: 0.0003 mmHg Specific Gravity: 1.66 Incompatibilities: Iron and rust Appearance and Odor: White to light tan crystals with a camphor-like odor.	Exposure to this substance may cause tremors, convulsions, and liver damage. Target organs include the Central Nervous System (CNS) and liver. Cases of liver cancer were noted in laboratory animals exposed to heptachlor.
1,1 Dichloroethene See also vinylidene chloride	75-34-4	PID: I.P. 10.00 eV, relative response ratio is 80%. FID: Relative response ratio for detection with the FID is 40%.	Air sample using a charcoal filter tube; carbon disulfide desorption; GC/FID detection in accordance with NIOSH Method #1015.	ACGIH: 5 ppm, STEL 20 ppm NIOSH as low as possible OSHA does not establish exposure limits.	Odor threshold - 190 ppm. An air purifying respirator equipped with an organic vapors filter is acceptable for escape purposes only. For exposures greater than the recommended exposure limits should employ supplied air respirators. Recommended glove: Butyl, nitrile, or neoprene.	Boiling Pt: 89°F; 32°C Melting Pt: -188°F; -122°C Solubility: Slight (0.04%) Flash Pt: -2°F; -19°C LEL/LFL: 6.5% UEL/UFL: 15.5% Vapor Density: 3.25 Vapor Pressure: 500 mmHg @ 68°F; 20°C Specific Gravity: 1.21 @ 20°F; 4°C Incompatibilities: Aluminum, air, copper, and heat. Polymerization may occur if exposed to oxidizers. Appearance and Odor: Colorless liquid with a slight sweet chloroform odor.	Overexposure to this substance may result in irritation to the eyes, nose, throat, and respiratory system. Dermal contact with concentrated solutions may cause slight irritation, redness and inflammation. Systemically, headaches, dizziness, nausea, and difficulty in breathing. Chronic effects may include kidney and liver dysfunction, and pneumonitis. This material has expressed cancer causing potential in laboratory animals including liver and kidney tumors.

TABLE 6-1

**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
NAS WHITING FIELD, MILTON, FLORIDA
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Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Dieldrin	60-57-1	No information found concerning ionization potential.	No specific information found.	NIOSH/OSHA - Carcinogen 0.25 mg/m ³ (skin). IDLH=50 mg/m ³		Boiling Point: Decomposes Solubility: 0.02% Flash Point: NA Vapor Pressure: Low Specific Gravity: 1.75 Non-combustible solid Incompatible with strong oxidizers, active metals such as sodium, strong acids, and phenols. Colorless to light tan crystals with a mild, chemical odor (insecticide).	Target organs is the central nervous system, liver, kidneys, and skin. Exposure can cause headaches, dizziness, nausea, vomiting, sweating limb jerks and convulsions.
Gasoline	8006-61-9	Relative response ratios for the components of gasoline range from 100 - 200% for PID and FID detection.	See components for measurement considerations.	ACGIH & OSHA: 300 ppm 500 ppm STEL NIOSH: Reduce to lowest feasible concentration.	Respiratory Protection: Odor threshold 0.7 ppm, adequate air purifying respirator with organic vapor cartridges up to 100 ppm. Recommended Gloves: Nitrile >6.00 hrs; PV alcohol >6.00 hrs; Viton/neoprene >8.00 hrs	Boiling Pt: 102°F; 39°C Melting Pt: Not available Solubility: Negligible Flash Pt: -50°F; -45°C LEL/LFL: 1.4% UEL/UFL: 7.6% Vapor Density: ~5 Vapor Pressure: 38-300 mmHg (varies seasonally) Specific Gravity: 0.74 @ 20/20°C Incompatibilities: Strong oxidizers, peroxides, strong acids, and perchlorates Appearance and Odor: Colorless liquid with gasoline odor.	Overexposure to this substance may result in irritation to the eyes, skin, and mucous membranes. Systemically, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, possible convulsion, and chemical pneumonia (aspiration). Prolonged or chronic exposures may result in possible liver or kidney damage. Components of this substance have been determined to be confirmed human carcinogens.

and hands before leaving site) will be extremely important. Inhalation exposure is not anticipated due to the use of wet drilling techniques and geoprobe sampling methods. Wetting procedures will be initiated if any other tasks produce visible dust.

6.2 PHYSICAL HAZARDS

The physical hazards that may be present during the performance of site activities are summarized below:

- Contact/entanglement with rotating equipment or machinery.
- Uneven or unstable terrain (slip, trip, and fall hazards).
- Contact with underground or overhead utilities (electric lines, gas lines, water lines, etc.).
- Strain/muscle pulls from heavy lifting.
- Pinch/compression points.
- Noise in excess of 85 decibels (dBA).
- Inclement weather
- Ambient temperature extremes (heat or cold stress).
- Other physical hazards associated with ongoing operations (proximity to heavy equipment and machinery, vehicular traffic, etc.).

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, many of these hazard are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Specific discussion on some of these hazards is presented below.

6.2.1 Contact/Entanglement with Rotating Machinery

Often the hazards associated with drilling operations are the most dangerous to be encountered during site activities. The SSO will thoroughly discuss safe drilling procedures as part of site-specific training and/or during daily safety meetings using safe work permits (Figure 10-1) presented in this HASP. The following rules will apply to all drilling operations:

- Site personnel will be aware of the location and operation of these devices.
- Each rig must be equipped with emergency stop devices which will be tested daily to ensure that they are operational.

- Long handled shovels or equivalent shall be used to clear cuttings from the borehole and rotating equipment.
- The driller may not leave the controls when the augers are rotating.
- Additionally, the rig shall not be moved while the mast is extended.
- Climbing the drill mast while equipment is rotating is prohibited.
- Climbing the mast without ANSI approved fall protection (i.e. belts, lanyards, and a fall protection slide rail) or OSHA approved portable ladders is prohibited.

6.2.2 Contact with Underground or Overhead Utilities

Underground utilities such as pressurized lines, water lines, telephone lines, buried utility lines, and high voltage power lines are known to be present throughout the facility. Clearance of underground and overhead utilities for each sample location will be coordinated with NAS Public Works personnel. Jim Holland is the point of contact for utilities clearance and can be reached at (904) 623-7181. Additionally, drilling operations will be conducted at a safe distance (>20 feet) from overhead power lines unless they are shielded. Whenever underground utilities are suspected within close proximity to subsurface sampling locations, the borehole will be advanced to a minimum of 5.0 feet with a hand auger prior to drilling. As built drawings may also be utilized for additional clarification. In certain cases, NAS Public Works personnel may need to deenergize electrical cables using facility lockout/tagout procedures to insure electrical hazards are eliminated.

6.2.3 Inclement Weather

Many of the project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather (electrical storms, tornadoes, etc.) conditions arise, the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

6.2.4 Ambient Temperature Extremes

Overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. Extremely cold temperatures are not expected to be encountered due to project location. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, work load and level of protective equipment will affect the degree of exposure. Site personnel will be encouraged to drink plenty of fluids to replace those lost through perspiration. Additional information such as Work-Rest Regimens and personnel monitoring may be found in section 4.0 of the Health & Safety Guidance Manual.

6.3 BIOLOGICAL HAZARDS

During warm months (spring through early fall), tick-borne Lyme Disease may pose a potential health hazard. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots), as well as performing frequent body checks will prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures, and symptoms of exposure consult Section 4.0 of the Health and Safety Guidance Manual.

Contact with poisonous plants and bites or stings from poisonous insects are other biological hazards to consider. Long sleeved shirts and long pants (tucked into boots), and avoiding potential nesting areas will minimize the hazards of exposure. All site personnel who are allergic to stinging insects such as bees wasps and hornets must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the medical data sheet and the FOL and SSO notified.

Contact with poisonous and carnivorous animals may also pose a health hazard during investigation activities. Alligators and cottonmouth snakes are known to be present in the flood plains and streams at NAS Whiting Field. Care will be taken to avoid, as much as possible, heavily vegetated areas that might harbor poisonous or carnivorous animals. Protective equipment (leggings, etc.) will be considered for use when contact with poisonous or carnivorous animals is likely.

7.0 AIR MONITORING

Monitoring devices such as Direct Reading Instruments (DRIs) will be employed at the site to detect and evaluate the presence of site contaminants and other potentially harmful agents. The specific type of monitoring and the associated instruments, frequency of use, and applicable action levels are dependent upon the specific scope of work and the contaminants of concern. As a result, specific air monitoring measures and requirements will be established in Table 5-1 of this site specific HASP. Section 1.0 of the B&R Environmental Health and Safety Guidance Manual contains detailed information regarding direct reading instrumentation, personal and area air sampling procedures, as well as general calibration procedures of various instruments.

7.1 PHOTOIONIZATION DETECTOR (PID)

A photoionization detector (PID) with a 10.2 eV (or equivalent) lamp will be used to monitor potential sources areas and to screen collected samples and breathing zones of employees during sampling and other intrusive activities. The PID has been selected because it is capable of detecting organic (and some inorganic) gases and vapors. When calibrated with isobutylene the PID has a one to one correspondence with benzene. Prior to the commencement of any field activities, the background level of the site must be determined and noted. Daily background readings must be taken away from areas of potential contamination to obtain accurate results. These readings, and any influencing conditions (i.e., weather, temperature, humidity) and location will also be documented in the Health and Safety Logbook as a matter of reference.

7.2 FLAME IONIZATION DETECTOR (FID)

A flame ionization detector (FID) may also be used to screen source areas and breathing zones of workers during sampling and other intrusive activities. The FID has been selected because it is capable of detecting long chain hydrocarbons more effectively than the PID. However, the FID is a secondary alternative to the PID, because of its inability to adequately respond to certain contaminants of concern. This is particularly an issue for Sites 30 and 32, coupled with barriers in supplementing its use (i.e., absence of available colorimetric tubes for certain substances). Additional information on this is provided in the notes following Table 5-2. In general, the PID is preferable over the FID for this project.

7.3 PARTICULATES

It is not anticipated that significant concentrations of dusts will be generated as a result of site activities. Mud rotary drilling methods will be utilized and therefore dust will be minimal. Generation of particulates is a greater concern for activities such as using hollow stem augering methods during soil boring tasks. If dusts are generated during any site operations, exposure will be minimized by the use of area wetting methods and/or other engineering or administrative controls (moving upwind of source, evacuation, etc.). Particulate monitoring therefore, is not anticipated for this project.

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section is included to specify health and safety training and medical surveillance requirements for both B&R Environmental and subcontractor personnel participating in site activities.

8.1.1 Requirements for B&R Environmental Personnel

All B&R Environmental personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at NAS Whiting Field. Additionally, B&R Environmental personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training within the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120(e)(4) will be required for site supervisory personnel.

Documentation of B&R Environmental introductory, supervisory, and refresher training as well as site-specific training will be maintained at the project. Copies of certificates or other official documentation will be used to fulfill this requirement.

B&R Environmental will conduct a pre-activities training session prior to initiating site work. Additionally, a brief meeting will be held daily to discuss operations planned for that day. At the end of the workday, a short meeting may be held to discuss the operations completed and any problems encountered. This activity will be supported through the use of a Safe Work Permit System (See Section 10.10).

8.1.2 Requirements for Subcontractors

All B&R Environmental subcontractor personnel must have completed introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120(e) and 8 hours of refresher training meeting the requirements of 29 CFR 1910.120(e)(8) prior to performing field work at the NAS. B&R Environmental subcontractors must certify that each employee has had such training by sending B&R Environmental a letter, on company letterhead, containing the information in the example letter provided in Figure 8-1 and by providing copies of certificates for all subcontractor personnel participating in site activities.

FIGURE 8-1

TRAINING LETTER

The following statements must be typed on company letterhead, signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Phillip Ottinger
Task Order Manager
B&R Environmental
800 Oak Ridge Turnpike, Suite A-600
Oak Ridge, Tennessee 37830

Subject: HAZWOPER Training for NAS Whiting Field, Milton, Florida

Dear Mr. Ottinger:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with all applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 126.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires an appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hours of refresher training as applicable and as required by 29 CFR 1910.120(e)(8) and that site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

8.2 SITE-SPECIFIC TRAINING

B&R Environmental will provide site-specific training to all site personnel who will perform work on this project. Site-specific training will also be provided to all personnel [U.S. Department of Defense (DOD), EPA, etc.] who may enter the site to perform functions that may or may not be directly related to site operations. Site-specific training will include:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Spill response procedures
- Review of the contents of relevant Material Safety Data Sheets

Site-specific documentation will be established through the use of Figure 8-2. All site personnel and visitors must sign this document upon receiving site-specific training.

8.3 MEDICAL SURVEILLANCE

8.3.1 Medical Surveillance Requirements for B&R Environmental Personnel

All B&R Environmental personnel participating in project field activities will have had a physical examination meeting the requirements of B&R Environmental's medical surveillance program and will be medically qualified to perform hazardous waste site work using respiratory protection

Documentation for medical clearances will be maintained in the B&R Environmental Pittsburgh office and made available, as necessary.

8.3.2 Medical Surveillance Requirements for Subcontractors

Subcontractors are required to obtain a certificate of their ability to perform hazardous waste site work and to wear respiratory protection. The "Subcontractor Medical Approval Form" provided in Figure 8-3 shall be used to satisfy this requirement, providing it is properly completed and signed by a licensed physician.

Subcontractors who have a company medical surveillance program meeting the requirements of paragraph (f) of OSHA 29 CFR 1910.120 can substitute "Subcontractor Medical Approval Form" with a letter, on company letterhead, containing all of the information in the example letter presented in Figure 8-4 of this HASP.

8.3.3 Requirements for All Field Personnel

Each field team member (including subcontractors) and visitors entering the exclusion zone(s) shall be required to complete and submit a copy of Medical Data Sheet presented in Tab 7 of the Health and Safety Guidance Manual. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

8.4 SUBCONTRACTOR EXCEPTIONS

Subcontractors who will not enter the exclusion zone during operation, and whose activities involve no potential for exposure to site contaminants, will not be required to meet the requirements for training/medical surveillance other than site-specific training as stipulated in Section 8.2.

FIGURE 8-3
SUBCONTRACTOR MEDICAL APPROVAL FORM

For employees of _____
Company Name

Participant Name: _____ Date of Exam: _____

Part A

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f), and was found to be medically -

- qualified to perform work at the NAS work site
 not qualified to perform work at the NAS work site

and,

2. Undergone a physical examination in accordance with OSHA 29 CFR 1910.134(b)(10) and was found to be medically -

- qualified to wear respiratory protection
 not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

- A copy of OSHA Standard 29 CFR 1910.120 and appendices.
 A description of the employee's duties as they relate to the employee's exposures.
 A list of known/suspected contaminants and their concentrations (if known).
 A description of any personal protective equipment used or to be used.
 Information from previous medical examinations of the employee that is not readily available to the examining physician.

Part B

I, _____, have examined _____
Physician's Name (print) Participant's Name (print)

and have determined the following information:

**FIGURE 8-3
SUBCONTRACTOR MEDICAL APPROVAL FORM
PAGE TWO**

1. Results of the medical examination and tests (excluding finding or diagnoses unrelated to occupational exposure):

2. Any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health:

3. Recommended limitations upon the employee's assigned work:

I have informed this participant of the results of this medical examination and any medical conditions which require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NAS work site, this participant

- may
 not

perform his/her assigned task.

Physician's Signature _____

Address _____

Phone Number _____

NOTE: Copies of test results are maintained and available at:

Address

FIGURE 8-4

MEDICAL SURVEILLANCE LETTER

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. Phillip Ottinger
Task Order Manager
B&R Environmental Corp.
800 Oak Ridge Turnpike, Suite A-600
Oak Ridge, Tennessee 37830

Subject: Medical Surveillance for NAS Whiting Field, Milton, Florida

Dear Mr. Ottinger:

As an officer of XYZ Corporation, I hereby state that the persons listed below participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR), Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response: Final Rule." I further state that the persons listed below have had physical examinations under this program within the past 12 months and that they have been cleared, by a licensed physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory protection. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at the NAS, Florida site.

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555.

Sincerely,

(Name and Title of Company Officer)

9.0 SPILL CONTAINMENT PROGRAM

9.1 SCOPE AND APPLICATION

It is anticipated that quantities of bulk potentially hazardous materials (greater than 55-gallons) will be handled during some of the site activities conducted as part of the scope of work. Significant quantities of waste water (decontamination, purge and development) and Investigative-Derived Wastes (IDW) may be generated as part of site activities. It is not anticipated, however, that spillage of these materials would constitute a significant danger to human health or the environment. Further, it is possible that as the job progresses disposable PPE and other non-reusable items may be generated. As needed, 55 -gallon drums will be used to contain waste waters, IDW, and other unwanted items generated during investigatory activities. These drums will be labeled with the site name and address, the type of contents, and the date the container was filled. Samples will be collected and analyzed to characterized the material and determine appropriate disposal measures. Once characterized they can be removed from the staging area and disposed of in accordance with Federal, State and local regulations.

9.2 POTENTIAL SPILL AREAS

Potential spill areas will be monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, there are various areas vulnerable to this hazard including the areas used for central staging and decontamination activities. Additionally, areas designated for handling, loading, and unloading of potentially contaminated soils, waters, and debris present limited potential for leaks or spills. It is anticipated that all IDW generated as a result of this scope of work will be containerized, labeled, and staged to await chemical analyses. The results of these analyses will determine appropriate disposal methods.

9.2.1 Site Drums/Containers

All drums/containers used for containing soils and liquids will be sealed, labeled, and staged within a centralized area awaiting shipment or disposal.

9.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, periodic inspections by the SSO will be conducted during working hours to visually determine that containers are not leaking. If a leak is detected,

the first approach will be to transfer the container contents using a hand pump into a new container. Other provisions for the transfer of container contents will be made and appropriate emergency contacts will be notified, if necessary. In most instances, leaks will be collected and contained using absorbents such as Oil-dry, vermiculite, or sand, which will be stored at the staging area in a conspicuously marked drum. This material too, will be containerized for disposal pending analyses. All inspections will be documented in the Project Logbook.

9.4 PERSONNEL TRAINING AND SPILL PREVENTION

All personnel will be instructed on the procedures for spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and/or the SSO will serve as the Spill Response Coordinator for this operation should the need arise.

9.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the minimum equipment which will be maintained at the staging area at all times for the purpose of supporting this Spill Prevention/Containment Program.

- Sand, clean fill, vermiculite, or other noncombustible absorbent (oil-dry);
- Drums (55-gallon U.S. DOT 17-E or 17-H)
- Portable storage tanks
- Shovels, rakes, and brooms
- Hand operated drum pump with hose
- Labels

9.6 SPILL CONTROL PLAN

This section describes the procedures the B&R Environmental field crew members will employ upon the detection of a spill or leak.

- 1) Notify the SSO or FOL immediately upon the detection of a leak or spill.
- 2) Employ the personnel protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the drum or raising the leak to the highest point. Spread the absorbent material in the area of the spill covering completely.

- 3) Transfer the material to a new container, collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment or disposal options.

- 4) Solid spills will be recontainerized with 2-inches of top cover, and await test results for treatment or disposal options.

It is not anticipated that a spill will occur in which the field crews cannot handle. Should this occur notification of appropriate emergency response agencies will be carried out by the FOL or SSO.

10.0 SITE CONTROL

This section outlines the means by which B&R Environmental will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a three-zone approach will be used during work at this site. This three zone approach will utilize an exclusion zone, a contamination reduction zone, and a support zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize the potential for the spread of contaminants, and protect individuals who are not cleared to enter work areas.

10.1 EXCLUSION ZONE

The exclusion zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are present in the proposed work areas of this site. It is anticipated that this will remain so until/unless contaminants are brought to the surface by intrusive activities, such as soil boring or sampling operations. Furthermore, once intrusive activities have been completed and surface contamination has been removed, the potential for exposure is again diminished and the area can then be reclassified as part of the contamination reduction zone. Therefore, the exclusion zones for this project will be limited to those areas of the site where active work is being performed plus a designated area surrounding the point of operation (see Table 5-1 for specific operation). The exclusion zone for this activity will be fragmented to represent the areas where the soil is disturbed through drilling or sampling activities. When possible, exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform site personnel.

10.1.1 Exclusion Zone Clearance

Prior to the initiation of site activities, utility locations will be identified by utility companies contacted through the NAS Contact. Additional utility surveys may be conducted by B&R Environmental through the use of available documentation provided by NAS and/or local utility companies. The positions of identified utilities will be field located and staked, to minimize the potential for damage during intrusive activities. Sample locations can be located to avoid buried utilities. In the event that a utility is struck during a subsurface investigative activity, the emergency numbers provided in Section 2.9 and Table 2-1 will be notified.

Access to work areas will be controlled by B&R Environmental personnel. No personnel will be permitted to enter site exclusion zones without site-specific training. Site visitors will be provided site-specific training and will be escorted by B&R Environmental personnel at all times.

10.2 CONTAMINATION REDUCTION ZONE

The contamination reduction zone (CRZ) will be a buffer area between the exclusion zone and any area of the site where contamination is not suspected. The personnel and equipment decontamination will not take place in this area, but will take place at a central location established for this project. This area instead will serve as a focal point in supporting exclusion zone activities. When applicable, this area will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility personnel.

10.3 SUPPORT ZONE

The support zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. In all cases, the support zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

10.4 SITE VISITORS

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe or participate in operations by B&R Environmental
- Regulatory personnel (EPA, OSHA, etc.)
- Navy and NAS Whiting Field Personnel
- Other authorized visitors

All personnel working on this project are required to gain initial access to the site by coordinating with the B&R Environmental FOL or designee and following established site access procedures.

Once access to the site is obtained, visitors will be required to obtain permission from the FOL and SSO. Upon gaining access to the site, all site visitors wishing to observe operations in progress will be escorted

by a B&R Environmental representative (arranged for by the FOL) and shall be required to meet the minimum requirements discussed below:

- All site visitors will be routed to the FOL, who will sign them into the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), the entity which they represent, and the purpose of the visit.
- All site visitors will be required to produce the necessary information supporting clearance to the site. This shall include information attesting to applicable training (40-hours of HAZWOPER training) and medical surveillance as stipulated in Section 8.0 of this document. In addition, to enter the site operational zones during planned activities, all visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this HASP.

Once the site visitors have completed the above items, they will be permitted to enter the operational zone. All visitors are required to observe the protective equipment and site restrictions in effect at the site at the time of their visit. Any and all visitors not meeting the requirements stipulated in this plan will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause the termination of all onsite activities until the unauthorized visitor is removed from the premises. Removal of unauthorized visitors will be accomplished with support from the FOL, SSO or on-site security personnel.

10.5 SITE SECURITY

Site security will be accomplished using existing base security resources and procedures, supplemented by B&R Environmental or subcontractor personnel if necessary. B&R Environmental will retain control over active operational areas. The first line of security will take place at the station wide fences restricting the general public. The second line of security will take place at the work site referring interested parties to the FOL. The FOL will serve as a focal point for site personnel, and will serve as the final line of security and the primary enforcement contact.

10.6 SITE MAPS

Once the areas of contamination, access routes, utilities, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. These maps will show utility locations, potential points of contact with the public, roadways, and other significant characteristics that may impact site operations and safety. Site maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

10.7 BUDDY SYSTEM

Personnel engaged in onsite activities will practice the "buddy system" to ensure the safety of all personnel involved in this operation.

10.8 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

B&R Environmental and subcontractor personnel will provide MSDSs for all chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of all chemicals used on site will be developed using Tab 5 of the Health and Safety Guidance Manual. The MSDSs will then be maintained in a central location and will be available for anyone to review upon request.

10.9 COMMUNICATION

B&R Environmental personnel will be working in close proximity to each other at NAS Whiting Field. As a result, hand signals, voice commands, and line of site will provide sufficient means of communication. When project tasks are performed simultaneously on different sites, vehicle horns will be used to communicate emergency situations.

If an emergency warranting evacuation occurs, the following procedures are to be taken:

- Initiate the evacuation via hand signals, voice commands, line of site communication, or vehicle horns. The following signals shall be utilized when communication via vehicle horn is necessary:

HELP	three short blasts	(. . .)
EVACUATION	three long blasts	(- - -)

External communication will be accomplished by using provided telephones at the site. External communication will primarily be used for the purpose of resource and emergency resource communications.

10.10 SAFE WORK PERMITS

All exclusion zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task by task basis. An example of the Safe Work Permit to be used is illustrated in Figure 10-1. These work permits will be further supported by the daily meetings conducted during their generation. This effort will ensure all site specific considerations and changing conditions are incorporated into the planning effort. All permits will require the signature of the FOL and SSO.

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The work permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

**FIGURE 10-1
SAFE WORK PERMIT**

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope (To be filled in by person performing work)

I. Work limited to the following (description, area, equipment used): _____

II. Names: _____

III. Onsite Inspection conducted Yes No Initials of Inspector _____
B&RE

SECTION II: General Safety Requirements (To be filled in by permit issuer)

IV. Protective equipment required	Respiratory equipment required
Level D <input type="checkbox"/> Level B <input type="checkbox"/>	Full face APR <input type="checkbox"/> Escape Pack <input type="checkbox"/>
Level C <input type="checkbox"/> Level A <input type="checkbox"/>	Half face APR <input type="checkbox"/> SCBA <input type="checkbox"/>
Detailed on Reverse	SKA-PAC SAR <input type="checkbox"/> Bottle Trailer <input type="checkbox"/>
	Skid Rig <input type="checkbox"/> None <input type="checkbox"/>

Modifications/Exceptions: _____

V. Chemicals of Concern	Action Level(s)	Response Measures
_____	_____	_____
_____	_____	_____

VI. Additional Safety Equipment/Procedures

Hardhat <input type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs) <input type="checkbox"/> Yes <input type="checkbox"/>
Safety Glasses <input type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness <input type="checkbox"/> Yes <input type="checkbox"/> No
Chemical/splash goggles .. <input type="checkbox"/> Yes <input type="checkbox"/> No	Radio <input type="checkbox"/> Yes <input type="checkbox"/> No
Splash Shield <input type="checkbox"/> Yes <input type="checkbox"/> No	Barricades <input type="checkbox"/> Yes <input type="checkbox"/> No
Splash suits/coveralls <input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type) <input type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe/shank Workboots <input type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen <input type="checkbox"/> Yes <input type="checkbox"/> No

Modifications/Exceptions: _____

VII. Procedure review with permit acceptors	Yes	NA	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency alarms	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation routes	<input type="checkbox"/>
Contractor tools/equipment inspected	<input type="checkbox"/>	<input type="checkbox"/>	Assembly points	<input type="checkbox"/>

VIII. Equipment Preparation	Yes	NA
Equipment drained/depressured	<input type="checkbox"/>	<input type="checkbox"/>
Equipment purged/cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Isolation checklist completed	<input type="checkbox"/>	<input type="checkbox"/>
Electrical lockout required/field switch tested	<input type="checkbox"/>	<input type="checkbox"/>
Blinds/misalignments/blocks & bleeds in place	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous materials on walls/behind liners considered	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.) Yes No
If yes, fill out appropriate section(s) on safety work permit addendum

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____
Job Completed by: _____ Date: _____

11.0 CONFINED SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter confined spaces.** A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

12.0 MATERIALS AND DOCUMENTATION

The B&R Environmental FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for all chemicals brought on site, including decon solutions, fuels, lime, sample preservatives, calibration gases, etc.
- Follow-up Reports
- A full-size OSHA Job Safety and Health Poster (posted in the site trailers)
- Training/Medical Surveillance Documentation Form (Blank)
- First-Aid Supply Usage Form
- Emergency Reference Form (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted at the site for quick reference purposes. In situations where posting of these documents is not feasible (such as no office trailer), these documents should be filed in a transportable file container and immediately accessible. The file should remain in the FOL's possession.

Chemical Inventory Listing - This list represents all chemicals brought on site, including decontamination solutions, sample preservatives, fuel, calibration gases, etc.. This list should be posted in a central area.

Material Safety Data Sheets (MSDSs) - The MSDSs should also be in a central area accessible to all site personnel. These documents should match all the listings on the chemical inventory list for all substances employed on site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

The OSHA Job Safety & Health Protection Poster - This poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.

Site Clearance Posting - This list is found within the training section of the HASP (See Figure 8-1). This list identifies all site personnel, dates of training (including site-specific training), and medical surveillance and indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

Emergency Phone Numbers and Directions to the Hospital(s) - This list of emergency numbers and hospital directions will be maintained at all phone communications points and in each site vehicle.

Medical Data Sheets/Cards - Medical Data Sheets will be filled out by all onsite personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to all personnel to be carried on their person.

Hearing Conservation Standard (29 CFR 1910.95) - This standard will be posted anytime hearing protection or other noise abatement procedures are employed.

Personnel Monitoring - All results generated through personnel sampling (levels of airborne toxics, noise levels, etc.) will be posted to inform individuals of the results of that effort.

Placards and Labels - Where chemical inventories have been separated, because of quantities and incompatibilities, these areas will be conspicuously marked using Department of Transportation (DOT) placards and acceptable [Hazard Communication 29 CFR 1910.1200 (f)] labels.

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirators
AOC	Area of Concern
CFR	Code of Federal Regulations
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
DOD	Department of Defense
DOT	Department of Transportation
EPA	Environmental Protection Agency
eV	electron Volts
FID	Flame Ionization Detector
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air
LEL/O ₂	Lower Explosive Limit/Oxygen
N/A	Not Available
NIOSH	National Institute Occupational Safety and Health
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photo Ionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
PVC	Poly Vinyl Chloride
SAP	Sampling and Analysis Plan
SCBA	Self Contained Breathing Apparatus
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
SWMU	Solid Waste Management Unit
TOM	Task Order Manager
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average
UV	Ultra Violet
WP	Work Plan

APPENDIX A
INJURY/ILLNESS FORMS AND INSTRUCTIONS

INJURY, ILLNESS, AND ACCIDENT REPORTING

INSTRUCTIONS FOR COMPLETING REQUIRED FORMS

In the event of an accident/injury/illness, there are several forms that must be completed and faxed to Pittsburgh within 8 hours of the incident. First of all, please contact Ginny Helms (PHSO) at (770) 413-0965 and Matt Soltis (HSM) at (412) 921-8912. If someone is injured, but does not need to go to the hospital or a doctor, (i.e. just receives first aid at the site) fill out the following forms:

- **Supervisor's Accident Report**
- **First Aid Register**

If it is later determined that a doctor's visit is necessary, fill out the top portion of the **Occupational and Illness Report Form**. This form must accompany the employee to the doctor's office. There is a section where the doctor must list the diagnosis and indicate when the employee can return to work.

If an employee is injured and medical treatment is needed initially, fill out the following immediately:

- **Supervisor's Accident Report**
- **Occupational and Illness Report Form**
- **Workers Compensation Form for the state in which the injured is employed**

The **OSHA 200 Log** should be filled out if an incident is recordable. Remember, recordable cases include the following:

- **Any occupational fatality**
- **Any occupational illness**
- **Any injury or illness that requires medical attention beyond first aid (even if the employee visits a physician and nothing more than first aid is administered, the injury is not recordable, but should be listed on the First Aid Register)**
- **Any injury or illness that causes the employee to miss work (Lost time cases)**
- **Any injury or illness that requires restricted duty or requires that the employee be moved to a different type of work**
- **Any injury or illness that results in a loss of consciousness**

The **Monthly Accident Summary** should be filled out with all accident/ injuries that occur. Contact Ginny Helms to complete this form.