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SITE HEALTH AND SAFETY PLAN

DRILLING SERVICES
FORT WINGATE DEPOT ACTIVITY
FORT WINGATE, NEW MEXICO

Prepared for:

ENVIRO-DRILL, INC.
8305 WASHINGTON PLACE
ALBUQUERQUE, NEW MEXICO 87113

Prepared by:

WESTERN TECHNOLOGIES INC.
3737 EAST BROADWAY ROAD
PHOENIX, ARIZONA 85040

November 18, 1996

Donald K. Fulton
Industrial Hygienist

Robert L. Hutzal, CIH, CSP
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FORT WINGATE DEPOT ACTIVITY SITE SAFETY AND HEALTH PLAN

1.0 INTRODUCTION

This Site Safety and Health Plan (SSHP) is submitted by Western Technologies Inc. (WT) in support of Drilling Services at the Fort Wingate Depot Activity (Site) in Fort Wingate, New Mexico, to be performed by Enviro-Drill, Inc. (EDI). The activities at the Fort Wingate Depot Activity site, will involve soil borings and the installation of monitor wells. This SSHP provides health and safety criteria for the protection of on-site personnel and the environment from the physical and chemical hazards associated with this Site.

2.0 SITE DESCRIPTION, SITE ACTIVITIES, AND HAZARD SUMMARIES

2.1 Site Description

The Fort Wingate Depot Activity Site is located in Fort Wingate, New Mexico. A general vicinity map of the Site area is presented in Appendix A. The Site is reported to contain petroleum contaminated soils from a leaking 250-gallon underground storage tank (UST), that had been removed in February, 1995, and located at Building 46, northeast of Fire Station Building 34.

2.2 Site Activities

EDI will be conducting drilling and soil boring activities at the former location of the leaking UST in order to install monitor wells in the area of contamination. EDI shall complete six borings to a depth 10 feet below the deepest significant soil contamination or to approximately 50 feet below ground surface (bgs). Three of the six borings shall be advanced into the water bearing zone of the perched aquifer at 65 to 75 feet bgs, then completed as two inch monitor systems. Soil sampling shall be conducted at five foot intervals, using a continuous hollow stem auger sampler. Borehole cuttings and all fluids generated, will be containerized and left on site. EDI anticipates that the drilling services shall take approximately 3 working days.

The potential hazards that may be encountered during the drilling activities include exposure to petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylenes (BTEX), and tetraethyl lead. Site personnel will conduct monitoring for petroleum hydrocarbons, BTEX and lead compounds during drilling activities in order to mitigate related hazards and to allow personnel to complete work activities with minimum exposure to such hazards.

2.3 Site Hazard Summary

Based on information provided by the U.S. Army Corps of Engineers, the following are health and safety hazards that may be anticipated to occur during soil boring and drilling activities:

- **Drilling Hazards:** Drilling activities associated with the soil borings and monitoring well installation at the work site shall be maintained in compliance with USACE Safety and Health Requirements Manual, EM 385-1-1, and appropriate Occupation Safety and Health Administration (OSHA) Construction Industry Standards (29 CFR §1926) and General Industry Standards (29 CFR §1910), including but not limited to 29 CFR §1910.120, Hazardous Waste Site Operations and Emergency Response. Using standard safety procedures and following regulations outlined in OSHA 29 CFR §1926, Subpart N, drilling will not be performed within 20 feet of overhead electrical hazards.

- Chemical Exposures: Review of previous data indicate the potential for exposure to petroleum vapors and possibly airborne dusts from drilling and excavation operations (specifically, benzene, toluene, ethylbenzene, total xylenes and tetraethyl lead). Accordingly, organic vapor levels should be monitored with the use of a direct reading photo ionization detector (PID).
- Particulate Exposures: Dust levels during the drilling activities do not appear to be a significant problem for this type of drilling equipment. Soil conditions should be monitored for dust levels and appropriate action taken to control exposure. The potential for dust exposure should be evaluated during the initial stages of drilling and used for the selection of the appropriate respirator type.
- Noise Exposures: Heavy equipment operating at the drilling site presents a potential noise hazard. OSHA Permitted Exposure Level (PEL) for noise is 90 decibels, A-weighted scale (dB(A)). The action level is 85 dB(A). It is recommended that personnel wear hearing protective devices, when performing drilling activities. Disposable hearing protection devices shall be made available to site personnel upon request. If measured noise levels exceed 85 dB(A), hearing protective devices shall be worn by all site personnel within the affected work zone.

The permissible levels of exposure of site personnel to toxic hazards are quantitatively expressed as the permissible exposure limit (PEL). These limits are mandated by the Occupational Safety and Health Administration (OSHA). Other levels discussed in the SSHP are the immediately dangerous to life and health (IDLH) and the Threshold Limit Value (TLV). Definitions of these terms are:

- PEL: Permitted Exposure Level - An exposure limit published and enforced by OSHA as a legal standard. PEL may be either a time-weighted average (TWA) exposure limit based on an 8-hour period, a 15 minute short term exposure level (STEL), or a not to be exceeded ceiling level (C).
- TLV: Threshold Limit Value - An airborne concentration of substances devised by the American Conference of Governmental Industrial Hygienists (ACGIH). It represents conditions under which it is believed that nearly all workers may be exposed on a daily basis, 40 hours per week, during a working lifetime, with no adverse effects. There are three types of TLVs: 1) Time Weighted Average (TLV-TWA); 2) Short Term Exposure Limit (TLV-STEL); and 3) Ceiling Level (TLV-C).
- TWA: Time-Weighted Average - The concentration of a chemical or agent in the air as an average determined over a specific period. The average is determined by sampling for the contaminant throughout the period.
- IDLH: Immediately Dangerous to Life and Health - An atmospheric concentration of toxic, corrosive or asphyxiant substance that poses an immediate threat to life, or would cause irreversible or delayed adverse health effects, or would interfere with an individual's ability to escape from a dangerous atmosphere. This value is established by the National Institute for Occupational Safety and Health (NIOSH) and OSHA.

Personnel at this Site must be aware of the potential chemical and safety hazards. This shall be accomplished through training of all personnel prior to working on Site. In addition, daily site safety meetings shall be conducted to ensure that proper work practices are followed and safety and health issues are addressed.

The level of personal protective equipment will be based on the presence of chemical hazards. Personnel at the Fort Wingate Depot Activity Site should not require special protective equipment unless chemical hazards are encountered. Special personnel protective equipment shall be readily available in the event the equipment is necessary. Site personnel must be trained such that they will be aware of the potential for

chemical hazard exposures. Protective equipment as described in Section 6.0 of this plan shall be available in the event that chemical hazards are encountered during the drilling operations.

2.4 Accident Prevention

The Site Safety Officer shall be responsible for implementation of this accident prevention plan. All on site personnel shall be accountable for reading, understanding, and following the guidelines contained herein.

- An initial indoctrination of site personnel including site specific safety training shall be done during a training session.
- The Site Safety Officer shall be responsible for maintaining a clean job site, free from hazards and providing safe access to and from the Fort Wingate Depot Activity work site. Physical barriers delineating the work site shall be used for traffic control and to limit access to any restricted work areas. Emergency phone numbers for the fire department, ambulance service and the nearest emergency medical facility must be available at the site and communicated to all personnel. A diagram showing the fastest route to the hospital shall be available. A portable telephone shall be available at the Site.
- A daily safety meeting shall be conducted to discuss pertinent site safety topics or changes in site conditions at the beginning of each work shift.

Should an accident occur, after providing first aid medical attention to the victim, the occupational injury or illness must be reported and recorded. If a loss work day occurs, the accident will be investigated and reported to the designated authority. If a fatality occurs, five or more persons are admitted to a hospital, or property damage in excess of \$10,000.00 (Class C-Accident) occurs, the accident will be reported immediately to OSHA. Records of all accidents and first aid treatments must be maintained.

Recordable accidents must be reported on the appropriate OSHA form. Recordable accidents are those accidents and occupational illnesses as described below.

- Class A Accident: An accident in which the resulting total cost of property damage and personnel injuries is \$500,000 or greater; or an injury or occupational illness resulting in a fatality or permanent total disability.
- Class B Accident: An accident in which the resulting total cost of property damage and personnel injuries is \$100,000 or more, but less than \$500,000; or an injury or occupational illness resulting in permanent partial disability or hospitalization of five or more personnel.
- Class C Accident: An accident in which the resulting total cost of property damage and personnel injuries is \$10,000 or more, but less than \$100,000; or an injury or occupational illness that results in a lost workday case with days away from work.
- Class D Accident: An accident in which the resulting total cost of property damage and personnel injuries is less than \$10,000 or an injury or occupational illness resulting in a lost workday case, with one or more days of restricted work activity, or a non-fatal case without lost workday.

3.0 ASSIGNMENT OF RESPONSIBILITIES

The assignment of responsibilities will be delegated and coordinated through the project manager. Assignments will be made to ensure that on site personnel are qualified as outlined in the SSHP.

3.1 Project Manager (PM)

The project manager is responsible to assure that the drilling activities are conducted in a manner consistent with the SSHP. The PM will coordinate with the on-site certified industrial hygienist (CIH) and project personnel to assure that the project goals are completed in a manner consistent with these guidelines and city, county, state, and federal regulations.

Project Manager, Rodney Hammer, Director, Enviro-Drill, Inc.

3.2 Certified Industrial Hygienist (CIH)

This SSHP shall comply with all federal, state, and local health and safety requirements. The on-site CIH is responsible for modifying specific aspects of this plan to adjust for site changes that affect safety. All modifications to the SSHP should be coordinated by the on-site CIH with the PM, and the on-site CIH should be available for consultation when required. The on-site CIH should prepare materials to be used in the training program and relay that information to the PM. In addition, the on-site CIH should provide site specific health and safety training, which will include respirator fit testing for all on-site personnel.

Certified Industrial Hygienist, Army Corps of Engineers Representative

3.3 Site Safety Officer

The Site Safety Officer will be designated by the PM and will be responsible for the day to day safety procedures at the Site. The Site Safety Officer will be responsible for:

- Scheduling and ensuring the daily safety meetings are held.
- Ensuring minutes and attendance records of the daily safety meeting are maintained and filed for reference.
- Reporting any and all safety and health concerns to the PM.
- Maintaining copies of the SSHP and the OSHA regulations.

The Site Safety Officer shall have certification documenting OSHA 40-hour Hazardous Waste Site training under 40 CFR §1910.120. The Site Safety Officer shall also have certification in First Aid/CPR.

Robert Helton, Site Safety Officer/Driller, Enviro-Drill, Inc.

3.4 Field Personnel

All field personnel, are responsible for understanding and complying with all requirements of the SSHP. Field personnel will be instructed during each daily safety meeting to bring all perceived unsafe or changes in site conditions to the attention of the Site Safety Officer or the PM. All site personnel shall have certification documenting OSHA 40-hour Hazardous Waste Site training and 8-hour updates, if applicable.

Donald Greer, Drillers Helper, Enviro-Drill, Inc.

4.0 PERSONNEL TRAINING

All site personnel engaged in activities around the Site shall meet the following training requirements:

- General site safety responsibilities, medical surveillance program, review of the SSHP,
- Potential chemical and physical hazards,
- Personal protective equipment and respiratory protection,
- Personnel and equipment decontamination.
- Emergency assistance network.

5.0 MEDICAL SURVEILLANCE PROGRAM

Medical monitoring of personnel shall be required to document fitness for work and competence with the use of respiratory protection as described in OSHA 1910.134. Persons assigned to tasks requiring the use of respirators shall provide a letter from a physician stating that they have received a physical examination within the past year and are physically capable of working at hazardous sites and wearing respiratory protection equipment.

Prior to starting work, an emergency medical assistance network must be established. This involves identifying the fire department, ambulance service, and hospitals near the work site. Emergency assistance can be obtained using the 911 phone number. Additionally, a vehicle shall be available on Site during all work activities to transport personnel with minor injuries to the identified emergency medical facility, if medical assistance is required. Minor injuries not requiring medical assistance, should be treated at the site, as soon as possible with the use of a first-aid kit. Latex gloves shall be made available to all personnel attending to any injuries, to prevent exposure to blood-borne pathogens.

The Site Safety Officer or designated persons involved with field activities shall have knowledge of first aid and cardio-pulmonary resuscitation (CPR). A first-aid kit shall be available at the site for use by trained personnel. An adequate supply of fresh water or portable emergency eye wash shall be available at the work site.

6.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) may be required during the course of the drilling work. Selection will be based primarily on hazardous material data and work task requirements. Based upon the hazard analysis information, the initial level of protection used for all activities shall be Level D. This level of protection shall be continuously re-evaluated based on field conditions. This SSHP does not address conditions requiring the use of PPE beyond Level C. In the event Level B conditions are warranted, site activities shall be re-evaluated by the PM in consultation with the on-site CIH.

6.1 Level D Personal Protective Equipment

Level D protection should be used when:

- The atmosphere contains no known hazard.
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation or contact with hazardous levels of any chemical.

Personnel working at the Fort Wingate Depot Activity Site shall wear as a minimum:

- Dedicated work uniforms (e.g.--coveralls),
- Boots, leather or chemical resistance, steel toe,
- Hard hat and safety glasses,
- Face shield or goggles, as mandated by Project Manager,
- Gloves, chemical resistant (nitrile), may be mandated only when handling contaminated soils.

6.2 Level C Personal Protective Equipment

Level C protection should be used when:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin.
- The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants.
- All criteria for the use of air-purifying respirators are met.

When air monitoring information dictates that a particular site be upgraded to Level C protection, personnel shall wear as a minimum:

- Half-mask air purifying respirator, (MSHA-NIOSH) approved, fitted with an organic vapor/HEPA cartridge combination filter,
- Hooded chemical resistant clothing (e.g.,--disposable chemical suits),
- Boots, leather, or chemical resistance, steel toe,

- Hard hat and safety glasses,
- Face shield or goggles,
- Gloves, chemical resistance (nitrile), as mandated by the on-site CIH during the handling of contaminated soils.

6.3 Respirator Selection and Fit Test

Prior to the start of the site activities, the Site Safety Officer will ensure all personnel are fit tested for negative pressure respirators. All respiratory equipment usage shall be in compliance with the requirements of the OSHA respiratory standard (29 CFR 1910.134). Fit test records will be maintained for each site worker. These records will document the size, brand, and model number of air purifying respirator assigned. The record will also indicate that a successful face seal fit was achieved. A copy of the fit test form is presented in Appendix B.

7.0 HAZARD ASSESSMENT

A hazard assessment shall be conducted to decide what control measures are necessary during the drilling work. The assessment shall cover the characterization of chemical, physical, and other safety hazards at the Site. A hazard assessment is an on-going process and will be conducted during the entire project.

7.1 Area Survey

The Site Safety Officer shall conduct a survey, prior to the initiation of drilling activities in order to determine appropriate control measures. Results of the survey will be made available to the Project Manager. Health hazards may include organic vapors and dusts. Safety hazards may include underground power lines, overhead power lines, and ground traffic and equipment. In addition, daily site reviews will be conducted to assess current conditions. If during these daily site reviews, a condition results where health and/or safety hazards are evident, then site activities shall be halted until the condition has been abated.

7.2 Air Monitoring

The main objective of atmospheric monitoring is to assess the potential hazards to site personnel, due to inhalation. Personnel shall conduct area monitoring using a photoionization detector (PID). The area monitoring will determine the need to upgrade personnel protective equipment. On site personnel shall conduct air monitoring in the event site conditions indicate the potential for a release of organic vapors. Personnel will conduct monitoring of organic vapors with a direct readout PID. The frequency of monitoring will be based upon site observations and operating conditions.

- Direct read monitoring: If necessary, site personnel shall use a PID for field determination of appropriate levels of personal protection. PID's shall be equipped with a 10.2 eV (or greater) probe to assure that organic vapors of concern are detectable. The PID used during the project shall be calibrated weekly on a minimum.
- Action levels: If necessary, organic vapor levels will be measured outside the work area, upwind from the Site to measure the background readings. The action level is the level for which recorded measurements, using a PID meter, results in a reading sufficient to justify upgrading to Level C protection.

The action level to upgrade to Level C shall be 5 PID meter units above background level taken continuously for 15 minutes. The Project Manager will be notified of the change of site conditions following the readings. PID meter readings greater than 25 units, for a continual period of 15 minutes or longer, shall cause the work activities to cease and the Site shall be evacuated. Site activities shall not resume until a review of the situation has been conducted by the PM and the on-site CIH and a course of action is agreed upon.

7.3 Heat Stress Monitoring

The stress of working in a hot environment can cause a variety of illnesses including heat exhaustion or heat stroke; the latter can be fatal. Use of personal protective equipment can significantly increase heat stress. To reduce or prevent heat stress the Site Safety Officer shall, as required when ambient temperatures exceed 70 degrees Fahrenheit, implement a schedule of rest periods and controlled beverage consumption to replace body fluids and salts. The following procedures and action levels shall be used, depending upon ambient site conditions, by the Site Safety Officer to monitor potential heat stress for workers at the Site:

Heart rate: Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate exceeds 110 beats per minute at the next period, shorten the following work cycle by another one-third and also monitor aural temperature.

Aural temperature: Aural thermometers (Thermo-Scan) measuring body temperature from the ear in one second, shall be used to measure the body temperature at the end of the work period. If aural temperature exceeds 99.6 F, shorten the next work cycle by one-third without changing the rest period. If aural temperature exceeds 99.6 F at the beginning of the next rest period, shorten the following work cycle by one-third. In addition to heart rate measurements, site personnel shall establish a work/rest schedule to be used for fit and acclimatized workers in impermeable ensembles reforming moderately heavy work.

The Site Safety Officer shall be responsible for monitoring and recording heart rates and aural temperatures. Daily temperatures shall be used as the primary indicator along with the physiological monitoring table in Appendix C, as the criteria for determining employee work/rest periods.

Site personnel shall be trained to recognize the symptoms of heat stress and the appropriate action to take upon recognition. Even though physiological monitoring is not always necessary, it is essential that personnel understand the significance of heat stress and its recognition. The Site Safety Officer should refer to the section on heat stress in the NIOSH/OSHA/USCG/EPA document, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities", published by the U.S. Department of Health and Human Services in October 1985. A copy of the table on the symptoms and treatment of heat stress is provided in Appendix C.

7.4 Cold Stress

Cold injury (frostbite and hypothermia) and impaired ability to work are dangers at low temperatures and when the wind-chill factor is low. To guard against them: wear appropriate clothing; have warm shelter readily available; carefully schedule work and rest periods, and monitor workers' physical conditions.

8.0 SITE CONTROL

Site control requires the establishment of a regulated area, designated work zone, and emergency evacuation protocol. To minimize the exposure of personnel and the public to the work site and contaminated material, site control procedures are needed. Safety procedures for preventing or reducing the potential of exposure of personnel to the work zone or contaminated material are:

- Set up physical barriers to exclude unnecessary personnel from the general work area,
- Use of warning signs around the site area.

Proper communication channels should be maintained during the project to insure adequate capability to report and respond to emergency situations or risks encountered during drilling activities.

8.1 Emergency Protocol

The Site Safety Officer shall take the following action to minimize chemical/physical hazards and operational mishaps:

- Evacuation routes from the Site shall be established and communicated to all personnel during the daily safety meetings at the initial safety training.
- Telephone or radio communication shall be established with off-site personnel to establish a communications link between site and off-site personnel.
- During any emergency, the Site Safety Officer shall ensure that all personnel are evacuated from the site and accounted for at a predetermined meeting location.
- In the event of a fire or other accidental emergencies, action shall be taken to address the emergency following the accounting of all personnel. An A-B-C rated fire extinguisher should be maintained at the work site to extinguish minor fires. Personnel should be properly trained in the use of fire extinguishing equipment in the event of a fire emergency.

8.2 Inspection

The inspection of the Fort Wingate Depot Activity Site must be performed initially by the Site Safety Officer. Daily site inspections shall be conducted by the Site Safety Officer, prior to the initiation of each work day. An evaluation must also be conducted with regards to any activity that may generate a hazard within the work space.

9.0 DECONTAMINATION PROCEDURES

In order to minimize the potential for exposure, all attempts shall be made to prevent contact with waste or contaminated soil in vicinity of the excavation at the Fort Wingate Depot Activity Site. To minimize contact, personnel should not eat, drink, or handle waste or contaminated soils at the Fort Wingate Depot Activity Site. Based on initial assessment of contaminated soils at the Fort Wingate Depot Activity Site, the following steps are expected to provide a level of personnel decontamination appropriate to preclude the spread of contamination:

- Initial wash with non-phosphate soap. All potentially contaminated areas (hands, etc.) should be washed. Rinse with clean water.
- If disposable coveralls are used, these should be properly handled and disposed. If cloth coveralls are used, these should be properly handled and laundered.
- Boots should be cleaned when leaving the work area or outer boots which can be placed in a receptacle for eventual decontamination should be utilized.

The Site Safety Officer shall periodically assess the effectiveness of the decontamination procedure and has the authority to correct the decontamination procedure, if conditions change.

10.0 DRILL RIG SAFETY REQUIREMENTS

10.1 Drilling Procedures

During drilling operations, **two** persons (driller and assistant) must be present at all times. The assistant must be instructed as to the location of the emergency shut-off switch. Unauthorized personnel must be kept at least ten feet from an operating drill rig. No person shall work within ten feet of an operating drill rig without Level D protection. The driller is the site safety officer, or the field team leader, and has the authority and the responsibility to shut down the drilling operations whenever a hazardous situation is deemed present.

The mast of the drilling rig must maintain clearance of 20 feet from any overhead electrical cables. All drilling operations will cease during electrical storms, rain and high winds.

10.2 Housekeeping

The first requirement for safe field operations is that the safety supervisor understands and fulfills the responsibility for maintenance and "housekeeping" on and around the drill rig.

- Suitable storage locations should be provided for all tools, materials and supplies so that tools, materials and supplies can be conveniently and safely handled without hitting or falling on a member of the drill crew or a visitor.
- Avoid storing or transporting tools, materials or supplies within or on the mast (derrick) of the drill rig.
- Pipe, drill rods, casing, augers and similar drilling tools should be stacked orderly on racks to prevent spreading, rolling or sliding.
- Penetration or other driving hammers should be placed at a safe location on the ground or be secured to prevent movement when not in use.
- Work areas, platforms, walkways, scaffolding and other access ways should be kept free of materials, debris and obstructions and substances such as ice, grease or oil that could cause a surface to become slick or otherwise hazardous.
- Keep all controls, control linkages, warning and operation lights and lenses free of oil, grease and/or ice.
- Do not store gasoline in any portable container other than a nonsparking, red container with a flame arrester in the fill spout and having the word "gasoline" easily visible.

10.3 Maintenance Safety

Good maintenance will make drilling operations safer.

- Wear safety glasses when performing maintenance on a drill rig or on drilling tools.
- Shut down the drill rig engine to make repairs or adjustments to a drill rig or to lubricate fittings (except repairs or adjustments that can only be made with the engine running). Take precautions to prevent accidentally starting of an engine during maintenance by removing or tagging the ignition key.
- Always block the wheels or lower the leveling jacks or both and set hand brakes before working under a drill rig.

- When possible and appropriate, release all pressure on the hydraulic systems, the drilling fluid system and the air pressure systems of the drill rig prior to performing maintenance. In other words, reduce the drill rig and operating systems to a "zero energy state" before performing maintenance. Use extreme caution when opening drain plugs and radiator caps and other pressurized plugs and caps.
- Do not touch an engine or the exhaust system of an engine following its operation until the engine and exhaust system have had adequate time to cool.
- Never weld or cut on or near a fuel tank.
- Do not use gasoline or other volatile or flammable liquids as a cleaning agent on or around a drill rig.
- Follow the manufacturer's recommendations for applying the proper quantity and quality of lubricants, hydraulic oils and/or coolants.
- Replace all caps, filler plugs, protective guards or panels and high pressure hose clamps and chains or cable that have been removed for maintenance before returning the drill rig to service.
- Batteries: When working around batteries extreme care should be taken. Wear goggles, no smoking permitted around batteries. If you should come in contact with battery acid, flush out the affected area with large amounts of water and seek medical attention.

10.4 Safe Use of Hand Tools

The following are a few specific and some general suggestions which apply to safe use of hand tools that are often used on and around drill rigs.

- When a tool becomes damaged, repair the tool before using it again or replace the tool.
- When using a hammer, any kind of hammer for any purpose, wear safety glasses and require all others around you to wear safety glasses.
- When using any kind of chisel, for any purpose, always wear safety glasses and require all others around you to wear safety glasses.
- Keep all tools cleaned and orderly stored when not in use.
- Use wrenches on nuts, not pliers.
- When using a wrench on a tight nut - first use some penetrating oil, use the largest wrench available that fits the nut, when possible pull on the wrench handle rather than pushing, and apply force to the wrench with both hands when possible and with both feet firmly placed. Always assume that you may lose your footing - check the place where you may fall for sharp objects.
- Keep all pipe wrenches clean and in good repair. The jaws of pipe wrenches should be wire brushed frequently to prevent an accumulation of dirt and grease which would otherwise build up and cause wrenches to slip.
- Never use pipe wrenches in place of a rod holding device.
- Replace hook and heel jaws when they become visibly worn.

- When breaking tool joints on the ground or on a drilling platform, position your hands so that your fingers will not be pinched between the wrench handle and the ground or the platform, should the wrench slip or the joint suddenly let go.

10.5 Clearing the Work Area

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

10.6 Start Up

All drill rig personnel and visitors should be instructed to "stand clear" of the drill rig immediately prior to and during starting of an engine. Make sure all gear boxes are in neutral, all hoist levers are disengaged, all hydraulic levers are in the correct nonactuating positions and the cathead rope is not on the cathead before starting the engine. All engines should be started according to the manufacturer's manual.

10.7 Safety During Drilling Operations

Safety requires the attention and cooperation of every worker and site visitor.

- Do not drive the drill rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick) look up to check for overhead obstructions. (Refer to Overhead and Buried Utilities). All drill rig personnel (with exception of the operator) and visitors should be cleared from the areas immediately to the rear and the sides of the mast. Prior to raising the mast, all drill rig personnel and visitors should be informed.

Before the mast of the rig is raised and drilling is commenced, the rig must be first leveled and stabilized with leveling jacks and/or solid cribbing. The drill rig should be releveled if it settles after initial setup. Lower the mast only when the leveling jacks are down and do not raise the leveling jack pads until the mast is lowered completely.

Before starting drilling operations, secure and/or lock the mast if required according to the drill manufacturer's recommendations.

The operator of a drill rig should only operate a drill rig from the position of the controls. If the operator of the drill rig must leave the area of the controls, the operator should shift the transmission controlling the rotary drive into neutral and place the feed control level in neutral. The operator should shut down the drill engine before leaving the vicinity of the drill.

Throwing or dropping tools should not be permitted. All tools should be carefully passed by hand between personnel or a hoist line should be used.

Do not consume alcoholic beverages or other depressants or chemical stimulants prior to starting work on a drill rig or while on the job.

If it is necessary to drill within an enclosed area, make certain that exhaust fumes are conducted out of the area.

Clean mud and grease from your boots before mounting a drill platform and use hand holds and railings. Watch for slippery ground when dismounting from the platform.

10.8 Unattended Boreholes

All unattended boreholes must be adequately covered or otherwise protected to prevent drill rig personnel, site visitors or animals from stepping or falling into the hole. All open boreholes should be covered, protected or backfilled adequately and according to ADEQ and ADWR regulations upon completion of the drilling project.

"Horsing around" within the vicinity of the drill rig and tool and supply storage areas should never be allowed, even when the drill rig is shut down.

When using a ladder on a drill rig, face the ladder and grasp either the side rails or the rounds with both hands while ascending or descending. Do not attempt to use one or both hands to carry a tool while on a ladder. Use a hoist line and a tool "bucket" or a safety hook to raise or lower hand tools.

An elevated derrick platform should be used with the following precautions:

- When working on a derrick platform, use a safety belt and a life line. The safety belt should be at least four inches wide and should fit snugly but comfortable. The life line, when attached to the derrick, should be less than six feet long. The safety belt and life line should be strong enough to withstand the dynamic force of a 250 pound weight (contained within the belt) falling six feet.
- When climbing to a derrick platform that is higher than twenty feet, a safety climbing device should be used.
- When a rig worker is on a derrick platform, the lifeline should be fastened to the derrick just above the platform and a structural member that is not attached to the platform or to other lines or cable supporting the platform.
- When a rig worker first arrives at a derrick platform, the platform should immediately be inspected for broken members, loose connections and loose tools or other loose materials.
- Tools should be securely attached to the platform with safety lines. Do not attach tools to your wrist or any other part of your body.
- When you are working on a derrick platform, do not guide drill rods or pipe into racks or other supports by taking hold of a moving hoist line or a traveling block.
- Loose tools and similar items should not be left on the derrick platform or on structural members of the derrick.
- A derrick platform over four feet above the ground surface should have toe boards and safety railings that are in good condition.
- Workers on the ground or the drilling floor should avoid being under rig workers on elevated platforms, whenever possible.

10.9 Lifting Heavy Objects

- Before lifting any object without using a hoist, make sure that the load is within your personal lifting capacity. If it is too heavy, ask for assistance.

- Before lifting a relatively heavy object, approach the object by bending at the knees, keeping your back vertical and unarched while obtaining a firm footing. Grasp the object firmly with both hands and stand slowly and squarely while keeping your back vertical and unarched. In other words, perform the lifting with the muscles in your legs, not with the muscles in your lower back.
- If a heavy object must be moved some distance without the aid of machinery, keep your back straight and unarched. Change directions by moving your feet, not by twisting your body.
- Move heavy objects with the aid of hand carts whenever possible.
- During an electrical storm all drilling operations shall be terminated and the crew should move away from the drill rig.

10.10 Overhead and Buried Utilities

The use of a drill rig on a site or project within the vicinity of electrical power lines and other utilities requires that special precautions be taken by both supervisors and site personnel. Electricity can shock, burn and/or cause death. Prior to the start up of drilling operations, overhead and buried utilities should be located and noted.

When overhead electrical power lines exist at or near a drilling site or project, consider all wires to be alive and dangerous. Watch for sagging power lines before entering a site. Do not lift power lines to gain entrance. Call the utility and ask them to lift or raise the lines or de-energize (turn off) the power.

Before raising the rig mast on a site in the vicinity of power lines, walk completely around the drill rig. Determine what the minimum distance from any point on the drill rig to the nearest power line will be when the mast is raised and/or being raised. **Do not raise the mast or operate the drill rig if this distance is less than twenty feet**, or if known, the minimum clearance stipulated by federal, state and local regulations.

Remember that both hoist and overhead power lines can be moved toward each other by the wind. In order to avoid contact with power lines, the drill rig should be moved with the mast down.

If there are any questions concerning drill rig safety at sites in the vicinity of overhead power lines, contact the local power company.

Underground electricity is as dangerous as overhead electricity. Be aware and always suspect the existence of underground utilities such as electrical power, gas, petroleum, telephone, sewer and water.

BLUESTAKE CENTER 1-800-STAKE-IT

If a sign warning of underground utilities is located on a site boundary, do not assume that underground utilities are located on or near the boundary or property line under the sign. Call the utility company in question to identify the exact location. The underground utilities may be a considerable distance away from the warning sign.

Always contact the owners of the utility lines or the nearest underground utility location service at least three days before drilling. The underground utility service will make and flag the locations.

10.11 Contact with Electricity

If a drill rig makes contact with electrical wires, it may or may not be insulated from the ground by the tires of the carrier. Under either circumstances the human body, if it simultaneously comes in contact with a drill rig and the ground, will provide a conductor of the electricity to the ground. Death or serious injury can be the result.

- If a drill rig or a rig carrier makes contact with overhead or underground electrical lines:
- Under most circumstances, the operator and other personnel on the seat of the vehicle should **REMAIN SEATED AND NOT LEAVE THE VEHICLE. DO NOT TOUCH OR MOVE ANY PART, PARTICULARLY A METALLIC PART, OF THE VEHICLE OR THE DRILL RIG.**
- If it is determined that the rig should be vacated, then all personnel should jump clear and as far as possible from the rig. **DO NOT STEP OFF - JUMP OFF.** Do not hang on to the vehicle or any part of the rig when jumping clear.
- If you are on the ground, stay away from the vehicle and the rig, do not let others get near the vehicle or the rig. Seek assistance from local emergency personnel (police or fire department).
- When an individual is injured and in contact with the drill rig or with power lines, rescue should be attempted with extreme caution, by trained rescuers. If rescue is attempted, use a long, dry unpainted piece of wood or a long, dry clean rope. Keep as far away from the victim as possible and do not touch the victim until he is completely clear of the drill rig or electrical lines.
- When the victim is completely clear of the electrical source and is unconscious and a heart beat (pulse) cannot be detected, begin CPR immediately.

10.12 Safe Use of Wire Line Hoists, Wire Rope and Hoisting Hardware

All wire ropes and fittings should be visually inspected during use and thoroughly inspected at least once a week for: abrasion, broken wires, wear, reduction in rope diameter, reduction in wire diameter, fatigue, corrosion, damage from heat, improper reeling, jamming, crushing, bird caging, kinking, core protrusion and damage to lifting hardware. Wire ropes should be replaced when inspection indicates excessive damage. All wire ropes which have not been used for a period of a month or more should be thoroughly inspected before being returned to service.

End fittings and connections consist of spliced systems and various manufactured devices. All manufactured end fittings and connections should be installed according to the manufacturer's instructions.

If a ball-bearing type hoisting swivel is used to hoist drill rods, swivel bearings should be inspected and lubricated daily to assure that the swivel freely rotates under load.

If a rod slipping device is used to hoist drill rods, do not drill through or rotate drill rods through the slipping device, do not hoist more than one foot of the drill rod column above the top of the mast, do not hoist a rod column with loose tool joints and do not make up, tighten or loosen tool joints while the rod column is being supported by a rod slipping device. If drill rods should slip back into the borehole, do not attempt to brake the fall of the rods with your hands or by tensioning the slipping device.

Most sheaves on exploration drill rigs are stationary with a single part line. The number of parts of line should not ever be increased without first consulting the manufacturer of the rig.

Wire ropes must be properly matched with each sheave, (if the rope is too large, the sheave will pinch the wire rope; if the rope is too small, it will groove the sheave). Once the sheave is grooved, it will severely pinch and damage larger sized wire ropes.

The following procedures and precautions must be understood and implemented for safe use of wire ropes and rigging hardware.

- Use tool handling hoists only for vertical lifting of tools (except when angle hole drilling). Do not use tool handling hoists to pull on objects away from the drill rig; however, drills may be moved using the main hoist if the wire rope is spooled through proper sheaves according to the manufacturer's recommendations.
- When stuck tools or similar loads cannot be raised with a hoist, disconnect the hoist line and connect the stuck tools directly to the feed mechanism of the drill. Do not use hydraulic leveling jacks for added pull to the hoist line or the feed mechanism of the drill.
- When attempting to pull out a mired down vehicle or drill rig carrier, only use a winch on the front or rear of the vehicle and stay as far as possible away from the wire rope. Do not attempt to use tool hoists to pull out a mired down vehicle or drill rig carrier.
- Minimize shock loading of a wire rope - apply loads smoothly and steadily.
- Avoid sudden loading in cold weather. Never use frozen ropes.
- Protect wire rope from sharp corners or edges.
- Replace faulty guides and rollers.
- Replace worn sheaves or worn sheave bearings.
- Replace damaged safety latches on safety hooks before using.
- Know the safe working load of the equipment and tackle being used. Never exceed this limit.
- Clutch and brakes of hoists should be periodically inspected and tested.
- Know and do not exceed the rated capacity of hooks, rings, links, swivels, shackles and other lifting aids.
- Always wear gloves when handling wire ropes.
- Do not guide wire rope on hoist drums with your hands.
- Following the installation of a new wire rope, first lift a light load to allow the wire rope to adjust.
- Never carry out any hoisting operations when the weather conditions are such that hazards to personnel, the public or property are created.
- Never leave a load suspended in the air when the hoist is unattended.
- Keep your hands away from hoists, wire rope, hoisting hooks, sheaves and pinch points as slack is being taken up and when the load is being hoisted.

- Never hoist the load over the head, body or feet of any personnel.
- Never use a hoist line to "ride" up the mast of a drill rig.
- Replacement wire ropes should conform to the drill rig manufacturer's specifications.

10.13 Safe Use of Cathead

The following safety procedures should be employed when using a cathead hoist.

- Keep the cathead clean and free of rust and oil and/or grease. The cathead shall be cleaned with a wire brush if it becomes rusty.
- Check the cathead periodically, when the engine is not running, for rope wear grooves. If rope grooves form to a depth greater than 1/8 inch, the cathead shall be replaced.
- Always use a clean, dry, sound rope. A wet or oily rope may "grab" the cathead and cause drill tools or other items to be rapidly hoisted to the top of the mast.
- Should the rope "grab" the cathead or otherwise become tangled in the drum, release the rope and sound an appropriate alarm for all personnel to rapidly back away and stay clear. The operator should also back away and stay clear. If the rope "grabs" the cathead, and tools are hoisted to the sheaves at the top of the mast, the rope will often break, releasing the tools. If the rope does not break, stay clear of the drill rig until the operator cautiously returns to turn off the rig engine and appropriate action is taken to release the tools. The operator should keep careful watch on the suspended tools and should quickly back away after turning off the engine.
- The rope should always be protected from contact with all chemicals. Chemicals can cause deterioration of the rope that may not be visibly detectable.
- Never wrap the rope from the cathead (or any other rope, wire rope or cable on the drill rig) around a hand, wrist, arm, foot, ankle, leg or any other part of your body.
- Always maintain a minimum of eighteen inches of clearance between the operating hand and the cathead drum when driving samplers, casing or other tools with the cathead and rope method. Be aware that the rope advances toward the cathead with each hammer blow as the sample or other drilling tool advances into the ground.
- Never operate a cathead (or perform any other tasks around a drill rig) with loose unbuttoned or otherwise unfastened clothing or when wearing glove with large cuffs or loose straps or lacing.
- Do not use ropes that are longer than necessary. A rope that is too long can form a group loop or otherwise become entangled with the operator's legs.
- Do not use more rope wraps than are required to hoist a load.
- Do not leave a cathead unattended with the rope wrapped on the drum.
- Position all other hoist lines to prevent contact with the operating cathead rope.
- When using the cathead and rope for driving or back-drilling, make sure that all threaded connections are tight and stay as far away as possible from the hammer impact point.

- The cathead operator must be able to operate the cathead standing on a level surface with good, firm footing conditions without distraction or disturbance.

10.14 Safe Use of Augers

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

- Prepare to start an auger boring with the drill rig level, the clutch or hydraulic rotation control disengaged, the transmission in low gear and the engine running at low RPM.
- Apply an adequate amount of down pressure prior to rotation to seat the auger head below the ground surface.
- Look at the auger head while slowly engaging the clutch or rotation control and starting rotation. Stay clear of the auger.
- Slowly rotate the auger and auger head while continuing to apply down pressure. Keep one hand on the clutch or the rotation control at all times until the auger has penetrated about one foot or more below ground surface.
- If the auger head slides out of alignment, disengage the clutch or hydraulic rotation control and repeat the hole starting process.
- Never put your hands on auger that is turning.
- An auger guide can facilitate the starting of a straight hole through hard ground or a pavement.
- Never clean auger threads with your hands.
- Brace yourself when lifting augers.
- Never throw augers into storage bins - hardfacing may fly off the auger and hit your body or eyes.

The operator and tool handler should establish a system of responsibility for the series of various activities required for auger drilling, such as connecting and disconnecting auger sections and inserting and removing the auger fork. The operator must assure that the tool handler is well away from the auger column and that the auger fork is removed before starting rotation.

10.15 Safety During Rotary and Core Drilling

Rotary drilling tools should be safety checked prior to drilling:

- Water swivels and hoisting plugs should be lubricated and checked for "frozen" bearings before use.
- Drill rod chuck jaws should be checked periodically and replaced when necessary.
- The capacities of hoists and sheaves should be checked against the anticipated weight to the drill rod string plus other expected hoisting loads.

Special precautions that should be taken for safe rotary or core drilling involve chucking, joint break, hoisting and lowering of drill rods:



ENVIRO-DRILL, INC
ALBUQUERQUE NM - FACSIMILE TRANSMITTAL
PHONE (505) 857-9876 • FAX (505) 821-2963
• CALL IF TRANSMISSION PROBLEMS OCCUR •

TO: David Willott FROM: Libby Heckman

COMPANY: Corps of Engineers NO. PAGES: 18

LOCATION: _____ FAX NO: 342-3199

MESSAGE: Here are those missing pages of the health and safety plan. Please notify me asap regarding any changes we need to make. I'll get those other changes back to you as soon as our H&S officer has reviewed them.



- Only the operator of the drill rig should brake or set a manual check so that rotation of the chuck will not occur prior to removing the wrench from the chuck.
- Drill rods should not be braked during lowering into the hole with drill rod chuck jaws.
- Drill rods should not be held or lowered into the hole with pipe wrenches.
- If a string of drill rods are accidentally or inadvertently released into the hole, do not attempt to grab the falling rods with your hands or a wrench.
- In the event of a plugged bit or other circulation blockage, the high pressure in the piping and hose between the pump and the obstruction should be relieved or bled down before breaking the first tool joint.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a rubber or other suitable rod wiper. Do not use your hands to clean drilling fluids from drill rods.
- If work must progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Drill rods should not be lifted and leaned unsecured against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

10.16 Safety During Travel

The individual who transports a drill rig on and off a drilling site should:

- Be properly licensed with a Commercial Driver's License (CDL) and should only operate the vehicle according to federal, state and local regulations.
- Know the traveling height (overhead clearance), width, length and weight of the drill rig with carrier and know highway and bridge load, width and overhead limits, making sure these limits are not exceeded with an adequate margin.
- Never move a drill rig unless the vehicle brakes are in sound working order.
- Allow for mast overhead when cornering or approaching other vehicles or structures.
- Be aware that the canopies of service stations and motels are often too low for a drill rig mast to clear with the mast in the travel position.
- Watch for low hanging electrical lines, particularly at the entrances to drilling sites or restaurants, motels or other commercial sites.
- Never backup a drill rig unless a person is there to assist you.
- Never travel on a street, road or highway with the mast of the drill rig in the raised or partially raised position.
- Removed all ignition keys when a drill rig is left unattended.

- All drill rigs shall have a backup alarm.

10.17 Loading and Unloading

When loading or unloading a drill rig on a trailer or a truck:

- Use ramps of adequate design that are solid and substantial enough to bear the weight of the drill rig with carrier - including tooling.
- Load and unload on level ground.
- Use the assistance of someone on the ground as a guide.
- Check the brakes on the drill rig carrier before approaching loading ramps.
- Distribute the weight of the drill rig, carrier and tools on the trailer so that the center of weight is approximately on the center line of the trailer and so that some of the trailer load is transferred to the hitch of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.
- The drill rig and tools should be secured to the hauling vehicle with ties, chains and/or load binders of adequate capacity.

10.18 Off-Road Movement

The following safety suggestions relate to off-road movement:

- Before moving a drill rig, first walk the route of travel, inspecting for depressions, stumps, gullies, ruts and similar obstacles.
- Always check the brakes of a drill rig carrier before traveling, particularly on rough, uneven or hilly ground.
- Check the complete drive train of a carrier at least weekly for loose or damaged bolts, nuts, studs, shafts and mountings.
- Discharge all passengers before moving a drill rig on rough or hilly terrain.
- Engage the front axle, if applicable, when traveling off highway on hilly terrain.
- Use caution when traveling side-hill. Conservatively evaluate side-hill capability of drill rigs, because the arbitrary addition of drilling tools may raise the center of mass. When possible, travel directly uphill or downhill. Increase tire pressures before traveling in hilly terrain (do not exceed rated tire pressure).
- Attempt to cross obstacles such as small logs and small erosion channels or ditches squarely, not at an angle.
- Use the assistance of someone on the ground as a guide when lateral or overhead clearance is close.
- After the drill has been moved to a new drilling site, set all breaks and/or locks. When grades are steep, block the wheels.

- Never travel off-road with the mast of the drill rig in the raised or partially raised position.

10.19 Tires, Batteries and Fuel

Tires on the drill rig must be checked daily for safety and during extended travel for loss of air. They must be maintained and/or repaired in a safe manner. If tires are deflated to reduce ground pressure for movement on soft ground, the tires should be reinflated to normal pressures before movement on firm or hilly ground or on streets, roads and highways according to the manufacturer's recommendations. During air pressure checks, inspect for:

- Missing or loose wheel lugs.
- Objects wedged between duals or embedded in the tire casing.
- Damaged or poorly fitting rims or rim flanges.
- Abnormal or uneven wear and cuts, breaks or tears in the casing.

The repair of truck and off-highway tires should only be made with required special tools and following the recommendations of a tire manufacturer's repair manual.

Batteries contain strong acid. Use extreme caution when servicing.

- Batteries should only be serviced in a ventilated area while wearing safety glasses.
- When a battery is removed from a vehicle or service unit, disconnect the battery ground clamp first.
- When installing a battery, connect the battery ground clamp last.
- When charging a battery with a battery charger, turn off the power source to the battery before either connecting or disconnecting charger leads to the battery posts. Cell caps should be loosened prior to charging to permit the escape of gas.
- Spilled battery acid can burn your skin and damage your eyes. Spilled battery acid should be immediately flushed off of the skin with large amounts of water and seek a medical physician at once.
- To avoid battery explosions, keep the cells filled with electrolyte, use a flashlight (not an open flame) to check electrolyte levels and avoid creating sparks around the battery by shorting across a battery terminal. Keep lighted smoking materials and flames away from batteries.

Special precautions must be taken for handling fuel and refueling the drill rig or carrier.

- Only use the type and quality of fuel recommended by the engine manufacturer.
- Refuel in a well-ventilated area.
- Do not fill fuel tanks while the engine is running. Turn off all electrical switches.
- Do not spill fuel on hot surfaces. Clean any spillage before starting an engine.
- Wipe up spilled fuel with cotton rags or cloths - do not use wool or metallic cloth.



- Keep open lights, lighted smoking materials and flames or sparking equipment well away from the fueling area.
- Turn off heaters in carrier cabs when refueling the carrier or the drill rig.
- Do not fill portable fuel containers completely full to allow expansion of the fuel during temperature changes.
- Keep the fuel nozzle in contact with the tank being filled to prevent static sparks from igniting the fuel.
- Do not transport portable fuel containers in the vehicle or carrier cab with personnel.
- Fuel containers and hoses should remain in contact with a metal surface during travel to prevent the buildup of static charge.

11.0 GENERAL SITE SAFETY REQUIREMENTS

A copy of this SSHP shall be maintained at the Fort Wingate Depot Activity work site at all times during drilling services. All activities shall be conducted in accordance with the policies outlined in this plan. The Site Safety Officer shall also maintain a copy of the OSHA regulations, and if available obtain a copy of the latest edition of the USACE, Safety and Health Requirements Manual EM 385-1-1.

The following practices are expressly forbidden during drilling activities:

- There shall be no intoxicating substances of any kind permitted on or near the Site (i.e., alcohol, illegal/illicit drugs, etc.). Under no circumstances will anyone known to be under the influence of intoxicating substances be allowed on the Site (violators are subject to dismissal).
- No firearms or other weapons shall be permitted on the Site (violators are subject to dismissal).
- Personnel shall not enter underground vaults, tanks, silos, manholes, excavation, or any confined space while performing activities for this project.
- All personnel must follow all instructions from the Site Safety Officer regarding the proper use of personal safety equipment.
- All personnel are responsible for practicing personal hygiene and are expected to wash hands, face, and forearms when leaving the work area.
- No smoking, eating, drinking, or chewing tobacco or gum shall be allowed on the Site. This measure is to decrease the probability of hand-to-mouth transfer and ingestion of hazardous materials.
- Good housekeeping is essential because of the Site conditions. Every effort shall be made to ensure the Site is maintained in a clean and safe condition at all times.
- No worker shall be allowed to work alone at any time. Another worker must be present at all times at the Site.
- Contact with potentially contaminated substances, kneeling on the ground, or leaning, sitting, or placing equipment on contaminated substances should be avoided.



i

**APPENDIX A
GENERAL VICINITY MAP**



**APPENDIX B
RESPIRATORY FIT TEST RECORD**

RESPIRATOR FIT TEST

I CERTIFY THE FOLLOWING EMPLOYEE WAS FIT TESTED USING THE QUANTITATIVE FIT TEST FOR NEGATIVE PRESSURE RESPIRATORS.

TRAINER'S NAME: William D. Cokey

TYPE OF RESPIRATOR, MAKE, AND MODEL USED FOR FIT TEST
7700-30M NORTH
Fit tested with AMYL ACETATE

EMPLOYEE NAME	DATE	PASS	FAIL	COMMENTS
Robert Helton	2/5/96	Y	N	AMYL ACETATE

ADDITIONAL COMMENTS:
Recheck twice!

Rob Helton
EMPLOYEE SIGNATURE

William D. Cokey
TRAINER'S SIGNATURE

DATE

2/05/96
DATE

**APPENDIX C
TABLES**

TABLE 1
HEAT STRESS SYMPTOMS AND TREATMENT

HEAT STROKE SYMPTOMS AND TREATMENT	
<i>Heat stroke is caused by a profound disturbance of the bodies heat-regulating mechanism. It is characterized by high fever and collapse, and sometimes by convulsions, coma and death.</i>	
SYMPTOM	<i>Onset may be sudden. A decrease or cessation of sweating may precede the attack by several hours. The patient is flushed, the skin is hot and dry. Weakness, headache, vertigo, anorexia, nausea and precordial distress are the usual complaints. Muscular twitching or cramps may occur. The patient appears anxious and listless; pupils are contracted early but dilate later; pulse rate may be 160 or more. The temperature rises rapidly to 105 or 106° F. or higher. Convulsions and projectile vomiting may develop and are very serious symptoms. Profound shock and circulatory collapse may follow and usually persist until death.</i>
TREATMENT	<i>The patient must be cooled immediately. If assistance is nearby, send for medical assistance at once. First aid treatment involves loosening the clothing but not removing them. Wet the body with cold water and use fanning motions to aid the cooling process. Massage the skin to aid in circulation due to blood vessel constriction from the cold water and fanning. Continue adding cold water to the body until medical assistance arrives.</i>

HEAT EXHAUSTION SYMPTOMS AND TREATMENT	
<i>Heat exhaustion results from exposure to excessive heat, characterized by prostration and varying degrees of circulatory collapse.</i>	
SYMPTOMS	<i>The victim is listless, apprehensive, may be disoriented, or in severe cases, unconscious. Usually, the skin is ashen, cold and wet, and perspiration is profuse. Prior to the onset of heat exhaustion, the patient may feel weakness, dizziness, headache, dim or blurred vision, irritability and mild muscular cramps. The pulse rate is usually less than 100 and there is no significant elevation of body temperature.</i>
TREATMENT	<i>The patient should be placed in a reclining position in a cool environment, with thigh clothing loosened. Cool water may be given orally. Salt replenishing liquids such as Gator-Aid and ERG (Gookinaid) may be given to replace lost minerals. Keep the patient quiet and call for medical assistance as soon as possible.</i>

**TABLE 2
EMERGENCY MEDICAL ASSISTANCE INFORMATION**

Police Department.....	911
Fire Department.....	911
Paramedic/Rescue.....	911
Hospital Emergency.....	911
Rehoboth McKinley Christian Hospital.....	(505) 863-7000

HOSPITAL ROUTE:

From Fort Wingate, take I-40 West to Route 602 South, exit at Nizhoni Boulevard, east to Hospital Drive, follow signs to hospital. A general vicinity map that identifies the route to Rehoboth McKinley Christian Hospital is provided in Appendix A.

EMERGENCY CONTACT:

Project Manager, Rodney Hammer, Director, Enviro-Drill, Inc.	(505) 857-9876
Site Safety Officer, Robert Helton, Driller, Enviro-Drill, Inc.	(505) 857-9876
Drillers Helper, Donald Greer, Enviro-Drill, Inc.	(505) 857-9876
Industrial Hygienist, Donald K. Fulton, WT Phoenix	(602) 437-3737

TABLE 3
CONTAMINANT PHYSICAL PROPERTIES

Contaminant	Vapor Pressure (mm Hg)	Water Solubility (%)	Flash Point (°F)	Lower Explosive Limit (% in air)	Upper Explosive Limit (% in air)	Ionization Potential (in Electron Volts -eV)
Benzene	75	0.18	12	1.3	7.9	9.24
Toluene	22	0.05	40	1.2	7.1	8.82
Ethylbenzene	7.1	0.015	55	1.0	6.7	8.76
Xylenes	7.0 - 9.0	insoluble	63 - 84	1.0	6.7	8.44 - 8.56
Petroleum Hydrocarbons	-40	-0.04	-40 - -86	1.1	5.9	-6.14
Tetraethyl Lead	0.2	insoluble	200	1.8	Unknown	11.10

**APPENDIX D
CERTIFICATIONS**



Western Technologies Inc.

The Quality People

Since 1955

Certification

awarded to

Robert C. Helton Jr.

for the successful completion of

**Hazardous Waste Operations
and Emergency Response**

8-Hour Refresher Course

In Compliance with OSHA 29 CFR 1910.120

William D. Coker
Certified Instructor

S95-0439
Certificate No.

11/20/95
Date

William D. Coker
Director, Health & Safety



Western Technologies Inc.

The Quality People
Since 1955

Certification

awarded to

Donald T. Greer

for the successful completion of

**Hazardous Waste Operations
and Emergency Response**

8-Hour Refresher Course

In Compliance with OSHA 29 CFR 1910.120

William T. Coker
Certified Instructor

S95-0440
Certificate No.

11/20/95
Date

William J. ...
Director, Health & Safety



Western Technologies Inc.

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Robert C. Helton Jr.

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**Hazardous Waste Operations
and Emergency Response**

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William D. Coker
Certified Instructor

S95-0439
Certificate No.

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Date

William J. ...
Director, Health & Safety



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Since 1955

Certification

awarded to

Donald T. Greer

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8-Hour Refresher Course
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William T. Coker
Certified Instructor

S95-0440
Certificate No.

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William J. ...
Director, Health & Safety