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95-02

**THE WATAUGA COUNTY LANDFILL
PERMIT NO. 95-02
ASSESSMENT PLAN**

**APPENDIX II:
HEALTH AND SAFETY PLAN**

DAA JN: 6520-13

Prepared for:

Board of Commissioners
Watauga County Landfill

Prepared by:

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1.0 Safety, Health and Emergency Response Plan

1.1 Purpose/Objective

This Safety, Health and Emergency Response Plan (**SHERP**) contains the requirements for protection of on-site personnel and the general public during the on-site activities at the Watauga County Landfill.

The protection of workers and environmental health and safety are major concerns during project activities and will not be compromised.

The main objective of this SHERP is to assure that safe working conditions are maintained at site work. Safety and Health measures have been established through contact with Draper Aden Associates breakdown of known site chemical contaminants and physical hazards.

This SHERP will be available for the review of all employees. Revisions to this plan will be made readily if a positive influence on site safety and health can be observed from the revision. No changes will take place without the notification of Q Environmental Co. (412) 478-4184.

1.2 Site Description

The Watauga County Landfill is less than one mile from the corporate limits of Boone, NC. The Watauga County Hospital is located 4.5 miles from the site. See hospital map attached.

Watauga county landfill was started in the 1930's and has received waste from many of the surrounding industries and local communities. The Landfill has no available, accurate, log of areas on the site which may contain higher concentrations of industrial contaminated soils and wastes.

Analysis of site groundwater monitoring wells, off site monitoring wells, site leachate, nearby surface streams and off site potable wells are noted to have no contaminant levels suspected capable of producing immediately dangerous to life and health, (IDLH), conditions.

It is expected that groundwater contaminants will be present in vapors, soil cuttings and fill in equal or greater levels as those shown in attachment B, chemical information/analysis.

Due to the nature of the Watauga County Landfill and its basic design, the decomposition of organics is a given condition. The initial engineering plan of this landfill did not consider the

bleeding of generated gases out of the fill by french piping or other means. The decomposition of organics is suspected of causing pockets of methane gas. The presence of methane was not previously tested for and will be monitored for by qualified individuals on the project during intrusive work.

1.3 Regulations and Guidelines

The SHERP and all activities conducted at the Watauga county Landfill will be in compliance with applicable requirements of the following publications:

- * 29 CFR 1910, General Industry Standards, "OSHA"
- * 29 CFR 1910.120, OSHA Final rule "Hazardous Waste Operations and Emergency Response"
- * 29 CFR 1926, Construction standards, "OSHA"

2.0 Responsibilities

2.1 All personnel

Each person is responsible for his/her own health and safety, for completing tasks in a safe manner and for reporting any unsafe act or conditions to his/her supervisor and or the Site Supervisor. All personnel on this project will adhere to those applicable rules and regulations stated in the listed publications in section **1.3** of this health and safety plan. If repeated violations are observed or reported to supervisors for any reason then individuals will be warned and dismissed if honest attempts of adherence are not undertaken. All on-site personnel will be trained in accordance with 29 CFR 1910.120 and this health and safety plan.

2.2 Project Manager

The Project Manager is ultimately responsible for ensuring that all project activities are completed in accordance with requirements set forth in this health and safety plan. The Project Manager will stay in contact with Q Environmental Co. personnel to identify potential hazardous conditions in site work or activities.

2.3 Master Driller

The Master Driller is ultimately responsible for those individuals

under his direction. The Master Driller will lead by example in safety awareness and work practices. The Master driller will supervise drill rig operations, borings, and well construction. The Master driller will be familiar with this document and will be aware of action levels pertaining to hazardous concentrations at site activities.

2.4 Driller Assistant

The driller assistant will be responsible for his own actions and safety while working on this project. The Driller Assistant will work in a manner which is acceptable by the guidelines set forth in this document. Hazardous conditions at the work area will be mentally noted by the Driller Assistant and addressed in safety meetings daily.

2.5 Geologist

The Geologist will be responsible for logging of boring information and construction. The Geologist will follow the work patterns of the drillers and his work will be integrated into that of the drillers. Both parties will be involved with each others work to the extent that safety awareness is insured. Activities which coincide with each other in the same work area will be under the direction of the Geologist or ultimately the project manager.

2.6 Monitor Tech

The Monitor Tech will be familiar with the equipment he/she is to be using on the site. All personnel will be made aware of the readings obtained by the technician. Safety margins will be set at 1/2 the Permissible Exposure Limits, (PEL). This level known as the action level will require site workers to follow the matrix safety procedures outlined in this health and safety plan in section 5.4.

2.7 Support Personnel

Support personnel will be present for on-site personnel for general decon and site emergencies. Support personnel will be capable of emergency rescue in at least one level of protection higher than is being used on site, level B on-site personnel may be rescued by level B support personnel in this specific instance. The support personnel may serve to aid driller activities while drilling is in progress. Support personnel may also be required to make runs to equipment facilities; this is not to be done when less than two support personnel are available for site emergencies.

2.8 Groundwater Sampling Tech

After construction of the monitoring wells, the groundwater in the

wells will be purged and sampled by a team of at least two sampling technicians. They will be responsible for understanding and complying with all site requirements. In addition they will be responsible for following the guidelines established by this Health and Safety Plan as well as all local, state and federal regulations. Every effort will be made to minimize agitation of purged groundwater and protect against splash hazards. By utilizing slow purge rates and proper ventilation hazardous vapor will be avoided.

2.9 Subcontractors

On-site subcontractors and their personnel are responsible for understanding and complying with all site requirements. Subcontractors are required to follow the guidelines established by this document and all publications referenced in section 1.3 of this health and safety plan as well as all applicable Local, State, and Federal regulations.

2.10 On-site Personnel and Visitors

All on-site personnel and visitors must comply with all applicable regulations outlined in section 1.3 of this document to include all Local, State, and Federal regulations. Each person is responsible for his or her own safety and health. Each person is responsible for completing each task in a safe manner and for reporting any unsafe acts or conditions to his/her supervisor immediately. All

Q Environmental Co.

identified site conditions will be in writing and addressed immediately to Draper Aden Associates site personnel for action. Personnel will monitor themselves and their fellow employees for signs and symptoms of heat stress and chemical exposure. See section 4.1 and 4.2.

3.0 Job Hazard Analysis

3.1 Scope of work

The scope of work on this project will remain focused on the drilling, installation, and sampling of piezometers and monitoring wells throughout the site location and surrounding properties. Drilling safety procedures will be followed during all phases of site work. Contaminated soil cuttings and ground water are expected to be encountered. Job Hazard Analysis will be focused on in morning safety meetings. The previous days work will be looked at and analyzed by all present to better improve safety and efficiency.

3.2 Job Safety

Drill rig safety procedures will focus on the following main topics of concern, the physical hazards and the chemical hazards.

3.21 Rig set-up

The drill rig is to be set-up in an established location, the rig will be aligned broadside to the prevailing wind direction to provide for dispersion of any vapors or methane pockets that may be released during drilling. If additional dispersion of the

generated vapors or gases is needed an intrinsically safe fan will be used to mechanically provide dilution ventilation. If the fan is electrical in nature and/or any other tools used on the site are electrical in nature, ground fault interrupters (GFI's) are required.

Leveling of the drill rig will occur each time the machine is set-up and final approval of the site set-up will be given by the master driller.

3.22 Site Delineation

The site at which drilling is to take place should be taped off or snow fenced in such a manner as to limit access from other employees on-site. A perimeter of at least five feet over the length of the mast should be used as the perimeter of the work area. For the purposes of groundwater sampling tape or fencing will not be necessary unless verbal warning proves ineffective.

3.23 Housekeeping

All site personnel will be required to keep the walkways and commonly traveled routes around the drill rig clean and free of debris, equipment, or unwanted refuse. Housekeeping is important and is the most common violation cited by OSHA on drill rig sites.

3.24 General Work Practices

All site personnel are responsible for their own safety. Unsafe acts can not only effect the person committing the act but others as well. For this reason it is to be put into writing a system of addressing unsafe work practices. The three strike method for unsafe acts will be in place. On the first offence an individual will receive a verbal warning with a written memo to file. On the second offence the individual will receive a written warning with memo to file and finally, a third offence, at the site supervisor's discretion the individual may be let go from the project.

4.0 Safety Program

The following procedures are mandatory for all personnel on-site. All site visitors entering zones must follow these same procedures. Personnel not following procedures will be warned. If they refuse to follow these procedures, they will be escorted from the site.

4.1 General Practices

- * At least one copy of this plan shall be available at the job work site.
- * At least one person trained in a minimum of basic first aid and CPR will be on site whenever intrusive work activities occur. As an alternative, this requirement is satisfied when a 911 emergency responder can respond within five minutes to the site.
- * No food, beverages, tobacco products shall be present, consumed or used in contaminated areas or potentially contaminated areas. Taking medication, smoking or applying cosmetics is also prohibited. These activities are allowed only in the established clean room areas.
- * Before eating, drinking, smoking, or taking medication, employees shall wash their hands and face and remove their outer garments.
- * At the end of each work shift, before leaving the site,

personnel who worked in contaminated areas shall thoroughly decon to remove any contaminants.

- * Emergency equipment shall be located in readily accessible uncontaminated areas. The eyewash must be capable of washing both eyes at once, delivering at least .4 gallons per minute for a minimum of fifteen minutes. At least one eyewash may be maintained in the exclusion zone (CRZ).
- * All personnel entering the site shall be briefed on the site hazards and required to review the health and safety plan and sign off on the document. All emergency procedures, communication methods, safety practices will be reviewed.
- * Employee entrance and exit routes shall be planned and emergency routes designated. A map showing evacuation routes shall be posted at the site.
- * Unfamiliar operations shall be discussed with affected employees before beginning work.
- * Work areas shall be illuminated to a minimum of twenty foot candles. Supplementary lighting may be necessary if night work is used to avoid heat stress problems.
- * No smoking will be permitted except in designated areas.
- * Fire extinguishers will be mounted on equipment as required. When there is a fire potential, fire extinguishers will be located in an adjacent area.

4.2 Buddy System

All on-site personnel shall use the buddy system. Buddies shall maintain visual contact with each other. Buddies must observe each other and be alert for signs of heat stress or toxic exposure, including nonvisual effects of toxic exposure, such as:

- * Changes in complexion and skin discoloration
- * Changes in coordination or demeanor
- * Excessive salivation and pupillary response
- * Changes in speech patterns
- * Headaches, dizziness, blurred vision
- * Nausea, cramps
- * Irritation of eyes, skin or respiratory tract

4.3 Heat Stress

Heat stress is a condition which does not overtake all individuals in the exact same way. Some signs of heat stress can be uncommon mannerisms, quick temper, lackadaisical attitude, hyperventilation, laughter for no apparent reason...etc. Heat stress is not to be taken lightly for its closeness to heat stroke is an incredibly fine line for most people.

Measures taken to avoid heat stress shall be frequent breaks during a work period. Individuals may construct canopies to avoid the

heating effect that the sun has on personal protective equipment. Work rest periods will change as personnel acclimate to the stress of the protective clothing. Safety meeting will focus on the signs of heat stress and employees will take note of these signs occurring in the field to their assigned buddy.

Working in hot environments in protective clothing does not allow the body the advantage of evaporation of perspiration to cool the body. Heat stress may be monitored by three means: heart rate, body weight, body temperature. The measurement of heat stress can be charted and defined for each individual but any one individual should not represent the group. Everyone will be different in all measurements. The best prevention of heat stress is education. The following definitions will help employees understand heat stress related terminology.

Heat Cramps - Heat Cramps are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet and abdomen.

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

- * pale, cool, moist skin
- * heavy sweating

- * dizziness, nausea
- * fainting

Heat stroke - heat stroke is the most serious form of heat stress. temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occur. Competent medical help must be obtained immediately. This is a true medical emergency. Signs and symptoms are:

- * hot, usually dry, skin, often red or blotchy
- * lack of or reduced perspiration
- * nausea
- * dizziness and confusion, disorientation
- * strong, rapid pulse initially
- * coma

One or more of the following controls can be used if heat stress is suspect and mandatory if it is detected by a pulse over 110 beats per minute.

- * employees should drink plenty of water throughout the day and should increase their salt intake slightly by salting their food a little heavier.
- * On-site drinking water will be kept cool at 10-15 degrees C, (50-60 degree F) to encourage personnel to drink more often.
- * A work regimen that will provide adequate rest periods for

cooling down will be established as required.

- * All personnel will be advised of the dangers and symptoms of heat stroke and exhaustion.
- * Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments.
- * Supervisors shall reinforce training daily for workers to monitor themselves and their co-workers for the effects of heat disorders and to take additional breaks as needed.
- * All breaks are taken in a protected rest area.
- * Employees shall not do other tasks during rest periods.
- * All employees shall be informed of the importance of adequate rest, acclimatization, and proper diet in the prevention of heat stress.

4.4 Sanitation

Sanitation is a concern on and off the site. In the hot zone sanitation of medical and emergency eyewash facilities are a concern. As one moves through the CRZ sanitation remains an important concern. This section will mandate site behavior in the area of sanitation.

4.41 Break Area

Break areas may be located in the exclusion zone or in the support

zone. The difference between the behavior in both areas is dramatic.

Exclusion zone break areas will consist of any device such as tarps, sun roofs, running cool water...etc. Any device which will offer a site worker a break from the stress of protective clothing, heat or heavy work in the exclusion zone. Protective clothing will not be removed while in the exclusion zone. Cool water may be applied to protective clothing resistant to water penetration in a manner to cool the outer surface of the protective clothing.

NOTE: Protective clothing will remain on at all times in the exclusion zone break areas. At no time will smoking or eating be allowed in this area. All personnel will clearly understand that this is a contaminated area.

Safe zone break areas will include the following privileges not exercised in the hot zone work areas:

- * Lavatory facilities
- * Potable water
- * Sanitary Facilities
- * Break areas with eating privileges
- * Break areas with smoking privileges

NOTE: All areas listed above will be designated by the site supervisor.

****** A special note about trash collection. No protective

clothing shall enter common trash containers. All protective clothing will be used in the hot zone and for no other means of work. Convenience of protective clothing is recognized on and off the site. Protective clothing may be worn only to protect street cloths from becoming dirty. If this is the case the suit or gloves,...etc. must be disposed of as hazardous. Analytical costs involved in cases of mistaken clean common trash collection are very high.

4.5 Rodents

The nature of an operating landfill offers a large habitat for rodents such as rats, mice, snakes...etc. In this site, especially if night work is to occur, provisions will be made to control exposure to these animals. If a rodent should happen to bite or scratch a worker immediate professional medical attention is to be given. It is common for such animals to carry diseases that can seriously effect the health and safety of site workers.

5.0 Personal Protective Equipment

The personal protective equipment (PPE) outlined in this health and safety plan have been selected in accordance with analytical data and review of potential contaminants on site. Drilling is commonly a very work intense task with employees becoming covered with soils and grease which binds and attracts dusts and dirt to an employee. Groundwater sampling presents splash/dermal exposures. Selection of PPE was also based on the duration of which employees will be exposed and chemical agents at work against the protective clothing.

5.1 Respiratory Protection

The following rules will be used as guidelines for the site respiratory protection program:

- * Only employees having adequate training in the maintaining, cleaning and storing respiratory protective equipment shall be permitted to use the equipment.
- * Only properly cleaned, maintained, National Institute of Occupational Safety and Health (NIOSH) approved respirators shall be used on site.
- * Selection of respirators, as well as any decisions regarding upgrading respiratory protection, will be made with the notification of Q Environmental Co.
- * Used air purifying cartridges shall be replaced at the

end of each shift, or if breakthrough is suspected.

- * Positive and negative pressure tests shall be preformed each time the respirator is donned.
- * Only employees who have been fit tested within the last 12 months will be allowed to work in atmospheres where respirators are required. Subcontractors shall provide certificates of respirator fit test completed within the last 12 months for each employee on site.
- * Respirator users shall be instructed in the proper use and limitations of respirators.
- * If an employee has a difficulty in breathing during the fit test or during use, he shall be evaluated medically to determine if he can wear a respirator safely while performing assigned tasks.
- * No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the health or safety of the employee will be impaired by respirator use.
- * Contact lenses shall not be worn while using any type of respiratory protection.
- * Air-supplied respirators shall be assembled according to manufacturer's specifications. Hose length, couplings, valves, regulators, manifolds and all accessories shall meet ANSI and the manufacturer's requirements.

- * Respirators shall be cleaned and sanitized daily after use.
- * Respirators shall be inspected during cleaning. Worn or deteriorated parts shall be replaced.
- * Facial hair that might interfere with a good face piece seal or proper operation of the respirator is prohibited. As a policy no one with a beard will be able to work under respiratory protection.
- * The site supervisor shall review the respiratory protection program daily to ensure employees are properly wearing and maintaining their respirators and that the respiratory protection program is adequately protecting the employees. Any employee not signing into work clean shaven will not be allowed to start work until he has done so.
- * SCBA's used for emergency response or site work shall be inspected weekly or as manufacturer requires.

5.2 Levels of Protection

The levels of protection used in the exclusion zone are based on specific site information. The levels of protection are outlined as follows:

Level A - Level A protection is not predicted to be needed with

current data supplied.

Level B - Level B protection will be used on site if levels of air borne dusts, fumes, vapors are found to be continually released from soils, and groundwater during intrusive work. The levels of contaminants will be at the action level or greater for sustained periods of at least fifteen minutes or greater to justify this level of protection.

Level C - Level C protection will be used as a minimum level of protection during initial drilling and installation work. All personnel in the exclusion zone will wear Level C protection. Level C is mandatory for any personnel entering an area where the airborne contaminants exceed or may exceed one-half the OSHA permissible exposure limit (PEL).

The following equipment will be used for Level C protection:

- * Air-purifying respirator with appropriate cartridges for the hazard. Organic vapor/acid gas - hepa cartridges will be used
- * Poly-coated disposable coveralls---> up-grade to pvc coveralls if continued ripping occurs
- * Inner surgical gloves - outer nitrile disposable---> may up grade to butyl if desired
- * Steel-toed pvc boots or steel toed boots with heavy pvc

pull-overs

- * Hard hat
- * No half mask respirators

Level D - Level D will be used by site personnel when there is no potential for exposure to toxic vapors or dusts. The following equipment will be used for Level D :

- * Hard hats
- * Safety glasses
- * Tyvex coveralls (optional, dependant on activity)
- * Steel-toed boots/shoes
- * Gloves as necessary

5.3 Using Personal Protective Equipment (PPE)

All exclusion zone personnel will adhere to this health and safety plan when selecting PPE. The PPE chosen will be the sole decision of the site supervisor based upon factual data obtained through the air monitoring program. Any decision to down-grade will be done so after consultation with Q Environmental Co. There are two major points of concern during PPE use and they are as follows:

Donning - When PPE is to be worn a set procedure is to be followed to insure that minimal cross contamination occurs during dress out.

- * Remove street cloths, store in clean locker

- * Put on scrubs/disposable underwear
- * Put on tyvex or rain gear, (poly-coated coverall)
- * Put on surgical gloves and outer gloves (PVC or nitrile gloves, tape up
- * Put on boots, boot covers and tape the coveralls to boots
- * Put on respirator if required - perform final fit check positive negative test
- * Put hood up on outer suit
- * Put on remaining safety equipment: hard hat, leather gloves, earmuffs...etc.

One person will remain outside for a safety check as each person is ready to enter the exclusion zone.

Doffing - Whenever an individual leaves the work site they will be accompanied by their buddy. If only three individuals are in the field at the time all three must come in from the exclusion zone. The buddy system will be used in the decon procedure to ensure a higher degree of success in the decon area. Cross contamination will occur in small amounts, however if adequate decon is conducted, cross contamination will be significantly reduced. The following order of doffing protective clothing will be used:

- * Upon entering the established CRZ contamination reduction zone rinse gross contaminants off protective clothing.
- * Step forward into wash tub area and continue to scrub

down protective clothing. Include a thorough rinse of mud off of boots and gloves.

- * Use tabs to loosen taped seams around legs and wrists.
- * Take off boot covers
- * Remove outer gloves only, leave surgical gloves on
- * Remove protective overalls
- * Remove Air Purifying Respirator, immediately store your respirator, (do not set it down any where).
- * All protective clothing should be stored for reuse or discarded in contaminated waste baskets. Waste baskets should clearly read contaminated protective clothing. Note that PVC coveralls may be reused as long as permeation and degradation do not occur.
- * Wash areas will be provided and clean scrubs can be worn until next shift in the Exclusion Zone.
- * Respiratory equipment will be cleaned and stored in a cool dry place free of, and protected from contaminants and the sun. Preferred cleaning solutions for masks are ten parts water to one part clorox or wet wipes, NOT ALCOHOL WIPES.

Any changes in this procedure will be through consultation with Q Environmental Co.

5.4 Selection Matrix

The level of personal protection can be based on contaminant

measurements of in air in the work environment when intrusive work, drilling, is being completed. Work is to immediately stop when:

- * Realtime air contaminants reach an action limit---> 1/2 the PEL (Published or Permitted exposure level), and sustain that limit for more that fifteen minutes all work is to stop and reconsideration of respiratory protection is to occur.
- * Work which generates a spike of more than a Permissible Exposure Level for greater than a five minute period of time
- * measurements of a lower explosive limit are observed for even an instant
- * a record of the air monitoring performed during well installation will be made available to the Groundwater Sampling Technicians prior to their work. Prior analysis of existing monitoring wells indicates that groundwater contaminant levels do not present an inhalation hazard. A review of the air monitoring record in as yet un-installed wells will inform the Sampling Tech team as to the appropriateness of air monitoring during groundwater sampling. As in all other site activities if air contaminants reached ½ of the PEL for more than 15 minutes during drilling and installation, requiring upgrading of respiratory protection, then similar precautions will be taken during sampling.

6.0 Site Control

Site control will require specific measures to control unauthorized personnel from coming on site or entering restricted areas. Individuals who wish to come on site must have permission to do so by the client and site personnel. A hazard briefing will be given and the following measures will be mandatory.

6.1 Authorization to Enter

The project manager may grant authorization to enter the site after receiving approval from the client. Access to contaminated areas will be limited to personnel with the proper training and background. Only those who have the proper training and a medical clearance form may enter the site. Representatives from regulatory agencies will be permitted on the site by appointment only to conduct professional business. Representatives of the news media will be referred to the public relations department of the client.

6.2 Hazard Briefing

The site supervisor shall prepare safety and health presentations or focus points during the morning briefings. All morning tailgate safety meetings will be acknowledged by signing off on a safety meeting form. The hazard briefing will also appear in the daily

log. The form will include the topic of the day and any additional comments brought up by the workers for discussion.

6.3 Documentation of Certificates

All personnel entering the site to work or observe work will have a site file established. The site file will include as a minimum, the following:

- * 40-Hour Training Certificate
- * 8-Hour Up-Date on 40-hour Training if applicable
- * Medical Clearance Form by M.D.
- * Resume of previous experience
- * Not required --- CPR Training Certificate

Personnel not going into the exclusion zone need not establish a field file, however should still obtain a hazard brief on the site and sign off on the briefing log.

6.4 Entry Log

All personnel will sign into the site in the morning at the beginning of the Support Zone. All personnel will sign into and out of the Exclusion Zone. All times of entry onto and off the site will be recorded. The sign in/out sheets will include time, date, name, job title.

6.5 Entry Requirements

All personnel entering the site Exclusion Zone must be intimately familiar with this safety and health plan. This document will provide critical support and back up in liability cases. All personnel must read this document in its entirety and sign off on it. A sign off sheet will be supplied in the back of this document.

6.6 Emergency Entry and Exit

During emergencies, decontamination will be conducted to the extent that the person injured or evacuated from the site is not further endangered. Professional emergency personnel capable of transporting a hazardous waste contaminated victim will be used. A running list of professional services with personal contacts will be added to this document and provided as a direct source of Emergency contacts. This list will appear beside every phone on site and will be listed in descending order of importance. All numbers will be called in the case of an emergency to notify all concerned individuals. See list section 10.3.

7.0 Decontamination

7.1 Contamination Control Zones

The project Manager shall establish contamination control zones for the project based on the location of contamination, remediation activities, accessibility, and site control. These zones must be clearly marked and defended against unauthorized personnel and policed within the workers.

7.2 Exclusion Zone (hot zone, EZ)

An exclusion zone is the area where drilling will occur. Contaminated materials will be moved in this area and source generations will occur. All work in this area will be under strict watch for protective equipment and unauthorized personnel.

7.3 Contamination Reduction Zone (decon, CRZ)

The Contamination Reduction Zone is established in an area between the exclusion zone and support zone. The purpose for this area is to provide a channel of decontamination so as to prevent the possibilities of cross contamination and off site migration of site contaminants.

7.4 Support Zone

The support zone is established in an uncontaminated area and is easily accessible by roadways and site driveways. Emergency response vehicles have known areas within the support zone to stage in the case of an on-site emergency.

7.5 Posting

Posting of hazardous waste signs, tape, barricades and safety awareness programs should be in place before work starts. All work zones will be clearly marked to include the Support zone, Contamination Reduction zone and the Exclusion zone.

7.6 Decontamination General Rules

An area outside the exclusion zone shall be designated as the break area. Employees shall proceed through personal decontamination before eating, drinking or smoking. No eating, drinking, smoking, chewing, shall take place in the exclusion zone or contamination reduction zone.

The site supervisor shall monitor the effectiveness of the decontamination procedures and, if ineffective, shall take appropriate steps to correct any deficiencies or modify the plan as

needed. Q Environmental Co. will be contacted as changes in the plan occur.

7.7 Equipment Decontamination

Equipment in the exclusion zone stays in the exclusion zone. If equipment is needed out of the zone it must first go to the equipment storage area in the CRZ and the equipment will go through a rigorous decontamination. Only after the tools are completely acceptable as clean may they leave the CRZ. All disposable equipment will be disposed of as hazardous or placed back on the landfill if permissible by the site work plan.

8.0 Air Monitoring

Air monitoring on this project will be completed once in a clean area to establish the daily background reading of the instrument. The background reading will be taken in an upwind direction of the site. Due to the nature of this project possible unknowns can exist. It is common to work on all unknown situations on hazardous waste sites in level B protection. A site walk should be performed with a Geiger-muller detector to ensure no radiological exposures will exist. The site history and oral reports received allow for a level D approach with continuous monitoring throughout intrusive work in off site locations. Within facility boundaries level C protection will be utilized. Personal sampling will be conducted on each employee at least once during the project. The results of the readings will be shared with the workers on the site. This safety and health plan allows for an immediate up-grade of PPE if readings are repeatable and consistent.

8.1 Air Monitors

Air monitors on this project will have a current calibration from the equipment supplier. The equipment will be maintained and recalibrated only by qualified individuals. Work is not to take place if the oxygen/methane/lower explosive limit monitor is not working. The on-site instruments to be used on this project are

the following:

- * Oxygen / Lower Explosive Limit - realtime
- * Methane - realtime
- * Chlorinated solvents colormetric detector tubes
- * Organic / Inorganic Infrared Spectrometer
- * Radiological dosimeter - realtime, Geiger-Muller detector
- * SKC personnel sample pumps

8.2 Monitoring Recordkeeping

The safety and health manager, or his designated representative, will be responsible for establishing and maintaining records of all required monitoring as described below :

- * Employee name, social security number, payroll number
- * The date,time,pertinent task information, exposure information
- * Description of the analytical methods, equipment used, calibration data
- * Type of personal protective equipment worn
- * Engineering controls used to control exposure

8.3 Notification

By the Employee Right-to-Know Law employees are to be notified of potential hazardous substances and chemicals in the work place. A

Hazardous communications program will be in effect to include:

- * A written program
- * Employee Training
- * Material Safety Data Sheets
- * Labeling

9.0 Medical Surveillance

9.1 Physical Examination

It is required that all site personnel receive a thorough physical by a Medical Doctor to include:

- * Medical and occupational history questionnaire
- * Chest X-ray - (in past year)
- * Urinalysis - (metals, sugar, cholinesterase)
- * SMCA 24 - Chemical profile - liver, kidney, blood
- * Pulmonary Function Test
- * Physical

The following information is provided to the examining physician:

- * Description of employees duties
- * Anticipated chemical and asbestos exposure levels
- * Description of the personal protective equipment to be used
- * Information from previous medical exams.

The exam will yield an approval for work on a hazardous waste sites to include lifting capacity and capability to wear a respirator.

9.2 Exit Physical

All personnel will show proof of a scheduled examination for an exit physical.

9.3 First Aid and Medical Treatment

All site personnel are to report any and all injuries and minor scratches that occur on the site. No injury is too minor. Treatment of scratches that only require a band-aid must be reported and recorded. All records of injury will accompany the employee's site file. Medical treatment will be rendered by qualified individuals. Accident investigations will immediately follow an injury after the situation has been stabilized. First aid kits will be available in the support zone.

9.4 Medical Records

An employees medical records are confidential and will not be kept on sight. Only an employee is capable of accessing his own medical file through the practicing physician. The records will be held by the physician of the company for 30 years. Employees and their authorized representatives have access to these records through the company physician.

10.0 Emergency Procedures

This health and safety plan has been developed to minimize the impact of health related impacts on employees. However, supplementary measures may still be necessary for the maintenance of site safety. Emergency response personnel and procedures have been included in this safety and health plan. See section 10.3.

10.1 General

The site supervisor will establish evacuation procedures and emergency signals which are agreed upon by all site personnel. Audio, Visual aids may be used, as well as radio communications if necessary. A basic plan for a natural dangers such as electrical storms or tornado will be in effect.

10.2 Emergency Response

All situations and emergencies on site will be handled in a manner as to minimize the adverse health effects to site workers. If an Incident occurs the following procedures will be followed:

- * The site safety supervisor will be the emergency coordinator. He/She will determine immediately if outside assistance is needed. Outside assistance will be summoned as needed. The emergency coordinator will act as liaison between responding agencies and site

personnel.

- * The emergency coordinator has the authority to commit resources as needed to minimize the threat to on-site and off site personnel.

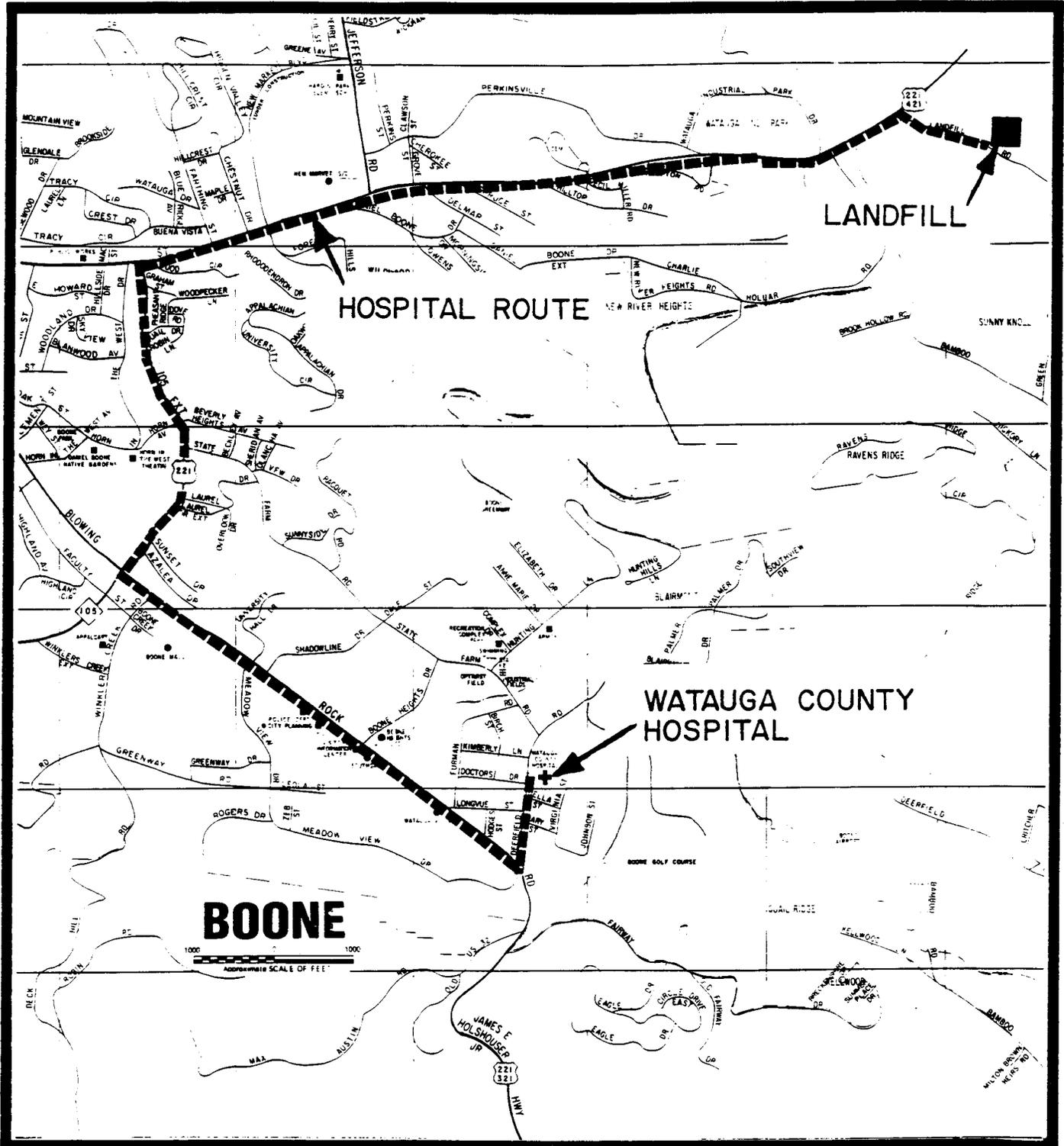
Q Environmental Co.

10.3 List of Public Agencies

<u>Agency</u>	<u>Phone #</u>	<u>Contact Person</u>
Fire Dept.	(704) 262/4520 (911)	Reginald Hassler Boone N.C. Fire Chief
Hospital	(704) 262/4100 (911)	Richard Sparks Hospital Administrator
Ambulance	(704) 264/9486 (911)	Tim Wilson
Security	(704) 264/3761 (911)	Red Lyons Watauga Co. Sheriff
Site Authorities	(704) 264/1702	Mark Combs Watauga Co. Sanitation Supervisor
	(704) 265/8000	Jim Ratchford Watauga Co. Manager
Regulatory Agency	(919) 733/2630	Claudette Farroro N.C. Department of Occupational Safety

Q Environmental Co.

APPENDIX A
HOSPITAL LOCATION MAP



HOSPITAL ROUTE

WATAUGA COUNTY LANDFILL
WATAUGA CO. NORTH CAROLINA



Draper Aden Associates
CONSULTING ENGINEERS

Richmond, VA Blacksburg, VA Nashville, TN

JOB No.
6520-13

DATE:
6-18-93

SCALE:
NONE

FIGURE

APPENDIX B

SITE MAP

Under Seperate Cover

Q Environmental Co.

APPENDIX C

DAA PROJECT ORGANIZATIONAL CHART

DAA PROJECT ORGANIZATION CHART

WATAUGA COUNTY
JAMES S. RATCHFORD
COUNTY MANAGER

DRAPER ADEN ASSOCIATES
WILLIAM A. ADEN, P.E.
MANAGING PRINCIPAL

DRAPER ADEN ASSOCIATES
RICHARD M. DISALVO, JR., P.E.
PROJECT ADMINISTRATOR

JUSTIN E. BABENDREIER
PROJECT MANAGER

**SURVEYING/
MAPPING**
Robert C. Bolles, L.S.
Fredrick D. Snell
Technical Support Staff

GEOTECHNICAL
William D. Newcomb, P.G.
Jeffery E. Smith
Robert S. Wilson

HEALTH AND SAFETY
Robert S. Wilson

**Environmental
Technician**
Leonard L. Diloia, Jr.

**QUALITY ASSURANCE
QUALITY CONTROL**
Janet M. Cleary
Robert L. Howard
Jeffery E. Smith

ANALYTICAL SERVICES
Pending.....



Draper Aden Associates

CONSULTING ENGINEERS

Blacksburg, Va. - Richmond, Va. - Nashville, Tenn.

Q Environmental Co.

ATTACHMENT A

MATERIAL SAFETY DATA SHEETS

(to be compiled by drilling and laboratory contractor)

(not yet selected)

Q Environmental Co.

ATTACHMENT B
CHEMICAL INFORMATION/ANALYSIS

**WATAUGA COUNTY LANDFILL
ATTACHMENT B - CHEMICAL INFORMATION ANALYSIS
SUMMARY OF GROUNDWATER CONTAMINANTS AND THEIR
MAXIMUM OBSERVED CONCENTRATION
IN MONITORING WELLS AND LEACHATE**

<u>Parameter</u>	<u>Observed Levels</u>	<u>Exposure Criteria</u>
Trichloroethylene aka: Trichloroethene (110 ppb, PZ24)	110 ppb	<ul style="list-style-type: none"> • TWA 25 ppm • IDLA 1000 ppm • Carcinogenic
1,1,1 Trichloroethane aka: Methyl Chloroform	1646 ppb	<ul style="list-style-type: none"> • 15 min. TWA 350 ppm • IDLH 1000 ppm • Carcinogenic
Tetrachloroethylene aka: tetrachloroethene	24.9 ppb	<ul style="list-style-type: none"> • TWA (OSHA) 25 ppm • IDLH 500 ppm • Carcinogenic
1,1-Dichloroethylene aka: 1,1-Dichloroethene	232 ppb	<ul style="list-style-type: none"> • TWA (OSHA) 1 ppm • STEL (15 min) (ACGIH) 20 ppm
1,1-Dichloroethane	250 ppb	<ul style="list-style-type: none"> • TWA 100 ppm • IDLH 4000 ppm
cis-1,2-Dichloroethene	225 ppb	<ul style="list-style-type: none"> • TWA 200 ppm • IDLH 4000 ppm
* Note: Eye irritant.		
Methylene Chloride aka: dichloromethane	23 ppb	<ul style="list-style-type: none"> • Carcinogen • Ceiling exposure 1000 ppm • TWA (OSHA) 500 ppm
Vinyl Chloride aka: chloroethene	18.3 ppb	<ul style="list-style-type: none"> • Carcinogenic • Ceiling limit 5 ppm • 15 min STEL 5 ppm
Dichlorodifluoromethane aka: Freon 12	21 ppb	<ul style="list-style-type: none"> • TWA - 1000 ppm • IDLH 50000 ppm

Chloroethane aka: ethylchloride	173 ppb	<ul style="list-style-type: none"> • TWA 1000 ppm • IDLH 20,000 ppm
*Chloroform aka: trichloromethane	2 ppb (MDL 1 ppb)	<ul style="list-style-type: none"> • STEL (60 min) 2 ppm • TWA (OSHA) 2 ppm
Trans-1,3 Dichloropropene aka: Propylene Dichloride	9 ppb	<ul style="list-style-type: none"> • TWA 75 ppm • IDLH 2000 ppm • Carcinogenic.
Benzene	9 ppb	<ul style="list-style-type: none"> • TWA 0.1 ppm • STEL 1.0 ppm
*1,4-Dichlorobenzene aka: p-Dichlorobenzene	0.8 ppb (MDL 0.5 ppb)	<ul style="list-style-type: none"> • TWA (OSHA) 75 ppm • STEL 110 ppm • IDLH 1000 ppm
*Bromodichloromethane	0.6 ppb (MDL 0.3 ppb)	
*Carbon Tetrachloride	0.3 ppb (MDL 0.1 ppb)	<ul style="list-style-type: none"> • TWA (OSHA) 2 ppm • STEL (60 min) 2 ppm • IDLH 300 ppm
*1,2-Dichloroethane	1 ppb (MDL 1 ppb)	<ul style="list-style-type: none"> • PEL 100 ppm
*1,2-Dichloropropane aka: propylene dichloride	0.3 ppb (MDL 0.3 ppb)	<ul style="list-style-type: none"> • TWA (OSHA) 75 ppm • STEL 110 ppm • IDLH 2000 ppm
*2,2-Dichloropropene	1.4 ppb (MDL 0.7 ppb)	
*1,1-Dichloropropene	3.8 ppb (MDL 0.5 ppb)	<ul style="list-style-type: none"> • TLV (ACGOH) 1 ppm
*Bis(2-ethyl-hexyl)phthalate	20 ppb (MDL 2 ppb)	

*Xylenes (total)

1 ppb
(MDL 0.4 ppb)

- TWA (OSHA/NIOSH) 100 ppm
- STEL 150 ppm
- IDLH 1000 ppm

4,4-DDD

0.1 ppb
(MDL 0.1 ppb)

* Compounds which may not be present due to their detection in trace amounts near analytic method detection limits (MDL), their known propensity to be laboratory contaminants, detection at only one sampling point, or occurrence in a trip blank.