Remediation

ISLIP RESOURCE RECOVERY AGENCY

REMEDIAL INVESTIGATION / FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

SONIA ROAD LANDFILL
WEST BRENTWOOD, NEW YORK
SITE REGISTRY NO. 152013

Dvirka and Bartilucci
Consulting Engineers

VOLUME III OF IV

DECEMBER 1996

HEALTH AND SAFETY PLAN
VOLUME III OF IV

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FOR THE
SONIA ROAD LANDFILL
WEST BRENTWOOD
SUFFOLK COUNTY, NEW YORK

(SITE REGISTRY NO. 152013)

PREPARED FOR
DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS
WOODBURY, NEW YORK

BY
FIELD SAFETY CORPORATION
SUITE 101, 579 LAKE DRIVE
GUILFORD, CT 06437

DECEMBER, 1996

APPROVAL PAGE

This Site Specific Health and Safety Plan (SHSP) has been prepared and reviewed in accordance with the minimum requirements of 29 CFR 1910.120.

Revised By: Dawn Han Date: 12/16/96

Dawn Han, CIH, MS, Industrial Hygienist

and Date: 12/16/96

Michael H. Ziskin, CHCM, CHMM

Approval:

Dvirka and Bartilucci Consulting Engineers

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1.0 GENERAL

This Site Specific Health and Safety Plan (SHSP) was prepared to meet the requirements of 29 CFR §1910.120 and §1926, the NIOSH/OSHA/USCG/EPA Guidance Manual for Hazardous Waste Site Activities (NIOSH No. 85-115), USEPA RI/FS guidance, and US EPA "Standard Operating Safety Guides". The SHSP addresses hazardous activities associated with the field investigation and sampling activities during the Remedial Investigation/Feasibility Study (RI/FS) at the Sonia Road Landfill (Sonia Road Landfill) West Brentwood in Suffolk County, New York (see Figure 1). Compliance with the SHSP is required of all on-site personnel entering the site. Visitors to the Sonia Road Landfill shall be subject to the requirements of this SHSP and be accountable to the authorities having jurisdiction at the site.

This Site Specific Health and Safety Plan (SHSP) has been prepared exclusively for use for the express purpose of conducting a Remedial Investigation/Feasibility Study (RIFS) at the subject property. This plan has been developed based upon site investigation assessment information, records available from Dvirka & Bartilucci Consulting Engineers and general industry accepted standards.

It is the responsibility of Dvirka & Bartilucci Consulting Engineers to insure the proper implementation of this plan or any changes to the plan dictated by new information obtained during the RIFS which will require modification to the SHSP by Field Safety Corporation in the form of an addendum. Field Safety Corporation cannot be held responsible for ensuring the accuracy or completeness of this SHSP relative to new information obtained during the RIFS. Information which could alter the contents of this SHSP may become available during the implementation of the RIFS.

1.1 Site Information

Site Name: Sonia Road Landfill
Address: 655 Sonia Road
West Brentwood, New York

Date of SHSP
Preparation: December, 1996

Section 2

2.0 PURPOSE AND SCOPE

2.1 Purpose and Scope of the Field Investigation

The field investigation to be conducted as part of the Remedial Investigation/Feasibility Study at the subject site will include the following: grid network survey, surface soil sampling, soil vapor survey, test trench/pit construction, on-site test borings, upgradient monitoring wells, perimeter hydropunch groundwater screening, on-site/perimeter monitoring wells, downgradient monitoring wells, monitoring well groundwater sampling, water level measurements, and public/private well survey.

2.2 Purpose and Scope of this SHSP

To ensure health and safety during various activities of the RI/FS, including sampling, drilling, and other related investigative activities by setting forth requirement for health and safety supervision, air monitoring, medical monitoring, personal protective equipment, controls, safe work practices, and proper decontamination.

Section 3

3.0 SUMMARY OF EXISTING INFORMATION

3.1 Site Location, Ownership and Access

The Sonia Road Landfill is located in West Brentwood in Suffolk County, New York (see Figure 1). The 42.2-acre site is currently owned by the Town of Islip and the site is currently vacant.

The entire site is fenced and main access to the site is from Corbin Avenue. Access gates are also located along Sonia Road and Deer Park Avenue.

3.2 Site Description

The Sonia Road Landfill is bordered to the north and west by industrial areas, and to the east and south by residential areas. The site is comprised of two sections, an eastern section comprised of approximately 19 acres and a western section comprised of about 23 acres. The sections are divided by a earthen berm running north and south through the approximate center of the landfill. The eastern section was filled first and later converted to a park/baseball fields, while the western half continued to accept wastes for a period of time. The western portion was never developed. According to a Town of Islip Report dated June 1982, it is estimated that the landfill contains between 1.5 and 2 million cubic yards of solid waste.

The landfill is presently listed as a Class 2 site on New York State Department of Environmental Conservation (NYSDEC) registry of inactive hazardous waste sites. It is believed that the landfill was placed on the registry in the early 1980s. Although the eastern half of the landfill was used as a park, it is now closed since some wastes have risen to the surface. The western half was rezoned for industrial use. A roadbed was built from crushed stone to allow the western section of the property to be subdivided and sold. However, the property remains undeveloped.

3.3 Site History

According to the Town of Islip Report dated June 1982, prior to 1965, the site of the Sonia Road landfill was a sand and gravel facility. Sand and gravel was excavated below groundwater. This created a groundwater lake at the site. The most active period of landfilling at the site occurred between 1965 and 1974. During most of its operational period, the landfill accepted all types of municipal solid waste, however, during the last few years of operation, the landfill only accepted refuse, rubbish, demolition materials and yard wastes, particularly leaves. In the early years of

operation, this site was used for disposal of junk cars. It is estimated that buried refuse averages 50 feet deep over 60% of the site.

According to NYSDEC records, the landfill allegedly received 400 cubic yards of hazardous materials from Hooker Chemical. These wastes reportedly consisted of gravel containing polyvinyl chloride, trimellitate plasticizers, 2-ethylhexanol and other alcohols. The wastes were allegedly disposed at the landfill from 1973 to 1974 and would, therefore, be located in the western portion of the landfill. According to the NYSDEC Immediate Investigation Work Assignment (IIWA) Work Plan dated July 1994, there have been unconfirmed allegations that trichloroethene and plating sludge may have been received at the landfill.

In 1979, the Suffolk County Department of Health Services (SCDHS) prepared a report entitled "Leachate Pollution Plume at the Sonia Road Landfill." As part of the investigation, 19 temporary leachate exploration wells were installed at various locations southeast and downgradient of the landfill, and one well was installed on the southeast edge of the landfill. Each well was 2 inches in diameter. All of the downgradient wells were installed to a depth of approximately 80 feet below the ground surface. The one well installed on the landfill was installed deeper, to a depth of 108 feet in order to determine the subsurface stratigraphy at the site and to obtain deep groundwater samples for analysis.

For the 19 downgradient wells, sampling of the groundwater was conducted by initially placing the well screens to approximately 80 feet below ground surface. Water was pumped from the well, and after "sufficient" pumping, a sample was collected and tested for temperature and specific conductivity. The well screen was then raised 10 feet by raising the entire casing and the well was pumped again and another sample was collected. This procedure continued until the final screen setting was immediately below the water table.

Based on the distribution of wells and the conductivity measurements, a leachate plume was delineated. The plume was reported to extend from the landfill for a distance of 3,800 feet toward the southeast. Its maximum width was determined to be 2,300 feet. Its thickness was determined to be approximately 88 feet due to the presence of Gardiners Clay. The report indicated that four of these wells were left as permanent wells to be used in the future as observation wells for future monitoring of the front of the plume. These wells were designated S62718, S62719, S62720 and S62721 (see Figure 2). According to an interoffice memorandum from SCDHS dated May 8, 1979, the four wells were screened at the "worst" leachate encountered as determined by conductivity measurement.

Included in the 1979 SCDHS report was a summary of the results of a report prepared by Holzmacher, Mclendon and Murrell, P.E. Consulting Engineers entitled "A Study of Leachate at landfill sites, 1975." As part of this study, three test borings were constructed within the landfill. One test boring was constructed in the western portion of the landfill, and two of the borings were constructed in the eastern portion of the landfill. Boring "A," constructed in the northeastern portion of the landfill, revealed the presence of at least 29 feet of refuse. Boring "B," constructed in the southwestern corner of the eastern portion of the landfill, also indicated the presence of 29 feet of refuse. Some refuse was noted six feet below the water table. Boring "C" was constructed in the southwestern portion of the landfill. This boring indicated the presence of refuse at least 35 feet below ground surface and at least 11 feet below the water table (see Figure 3).

Refuse in the eastern portion of the site was described as consisting of wood, roots, glass, plastic, metal and general rubbish. The refuse in the western portion of the landfill was described as containing wood, glass, plastic, metal, cardboard, concrete and household wastes.

According to a SCDHS news release dated August 1982, six SCDHS wells were sampled near the Sonia Road Landfill to detect the possible presence of vinyl chloride. Additionally, eight public water supply wells in the area operated by Suffolk County Water Authority and four private wells were also sampled. The news release indicated that one well on the outer edge of "plume" had vinyl chloride exceeding the detectable limit of 0.7 ug/l. None of the other wells indicated the presence of vinyl chloride above the detection limit. Therefore, based on these results, the news release indicated that it would be difficult to attribute the vinyl chloride to the landfill. The news release further indicated there is no evidence to prove that the vinyl chloride did come from the landfill. The results from the private wells and public water supply wells were not specifically addressed. However, a statement from the Suffolk County Health Commissioner recommended all private well owners connect to public water supply.

In addition to the sampling discussed in the news release, SCDHS collected several groundwater samples from the six downgradient wells between 1981 and 1983. (The locations of these wells are shown in Figure 2.) SCDHS also collected one sample from a residential well located approximately 1,000 feet south of the landfill. A summary of the results was provided on the report prepared by Golder Associates for the Islip Resource Recovery Agency in June 1995.

The results of one sample collected from the residential well indicated the presence of 1,1,1-trichloroethane at 3 ug/l. No other volatile organics analyzed for were detected. Well S62721 was sampled in August 1982 and indicated the presence of vinyl chloride at 9 ug/l. This well was resampled two weeks later and indicated the presence of vinyl chloride at 6 ug/l. This well is approximately 3,700 feet southeast of the landfill and was reported to be within the vicinity of the area impacted groundwater as defined by SCDHS 1979 investigation.

1,1-Dichloroethane and 1,1-dichloroethene were detected at concentrations of 36 ug/l and 9 ug/l in well S62718 in November 1983. Well S62720 indicated the presence of 1,1-dichloroethene at 5 ppb during this sampling event and levels of cis-dichloroethene, benzene and chlorobenzene were detected in S62721 at 20 ug/l, 5 ug/l and 7 ug/l, respectively.

In June 1983, Woodward-Clyde Consultants, under contract to NYSDEC, prepared a Phase I Preliminary Investigation report for the Sonia Road Landfill. The investigation comprised compilation of pertinent background information on the site. Preliminary Hazard Ranking Score (HRS) Work Sheets were prepared and site history, site hydrogeology and past sampling and analysis were evaluated. Based on the results of this background information review, additional investigation, which included site specific sampling and analysis under a Phase II investigation, was recommended. A Phase II investigation was never performed for the site.

At the request of NYSDEC, the Town of Islip installed several methane monitoring wells along the perimeter of the site. Based upon continuing monitoring, although methane is being produced (as evidenced by recent and historical methane monitoring), there is no evidence that methane is migrating off the site. Continued monitoring of the wells does not indicate any methane problems.

In a May 19, 1993 letter from NYSDEC to SCDHS, the NYSDEC indicated they sampled wells S62720 and S62721. These wells are one-half mile and three quarters of a mile downgradient from the landfill, respectively. Of the monitoring wells sampled between 1981 and 1983 by SCDHS, these were the only remaining usable wells. Both wells are 80 feet deep and screened between 75 and 80 feet. The NYSDEC reported that sample results from these wells indicated low levels of chlorinated hydrocarbons present in the groundwater. Specifically, the results of the volatile organic analyses indicated 25 ug/l of trichloroethene (TCE) in S62720 and 350 ug/l of TCE in S62721. Other compounds, such as tetrachloroethene (PCE) at 25 ug/l, 1,1,1-trichloroethane (TCA) at 22 ug/l and 1,2-dichloroethene (DCE) at 27 ug/l, were also detected in S62721.

The only other compounds detected, not attributed to blank contamination in S62720, were 1,1-dichloroethane (DCA) at 5 ug/l and 1,2-DCE at 4 ug/l. Vinyl chloride was not detected in either sample.

Although low levels of chlorinated hydrocarbons were detected, NYSDEC did not feel that these wells directly monitored the landfill. Specifically, NYSDEC indicated that there were several potential sources upgradient of the landfill which could be responsible for the volatile organic compounds detected. In particular, they identified the Baron Blakeslee Site and the Chemical Pollution Control Site. The NYSDEC further indicated that a sample from one of Chemical Pollution Control's monitoring wells was used as an upgradient well for the landfill. This well indicated that similar volatile organics are present in the groundwater upgradient of the landfill. As a result, NYSDEC requested assistance from SCDHS to install five water table wells and one deep monitoring well in the immediate vicinity of the landfill. To date, the monitoring wells requested by NYSDEC have not been installed.

Correspondence has been exchanged between the Town and NYSDEC addressing delisting of the Sonia Road Landfill and/or reassessment of the basis for the original designation of the landfill as a Class 2 site. In response, NYSDEC developed an Immediate Investigation Work Assignment Work Plan for the installation of eight Geoprobes along the perimeter of the landfill (see Figure 3).

The eight Geoprobes were installed in August 1994. Based upon NYSDEC interpretation of groundwater flow in the area of south-southeast to southeast, four upgradient and four downgradient locations were selected. Two groundwater samples were collected from each Geoprobe location, one just below the water table (13 to 29 feet below ground surface) and one approximately 30 feet below the shallow samples (43 to 59 feet below ground surface). The depth for the deeper samples was determined by field screening of the groundwater at 30 feet below the water table, 40 feet below the water table and 50 feet below the water table for alkalinity, specific conductivity and temperature at a downgradient Geoprobe location. These screening depths were selected based upon information contained in the 1979 SCDHS report, which indicated that groundwater at 43 feet below the water table had the highest specific conductivity, while groundwater at 53 feet below the water table had the highest temperature. Equipment limitations also were also a factor in the selection of the screening depths. As discussed in the IIWA Work Plan, NYSDEC surmised that the selected sampling depths would be the most likely depth to intercept any of the alleged chemical wastes moving with groundwater.

All groundwater samples were analyzed for Target Compound List (TCL) +10 volatile organic compounds (VOCs) and TCL metals. In addition, TCL +20 semivolatile organic compounds were analyzed for each of the shallow samples. TCL pesticides/PCBs and cyanide were only analyzed for the shallow sample obtained at Geoprobe location GP-6. Preliminary, unvalidated results of these samples are provided in Table 2-1. As shown in this table, the results of the sampling indicate the presence of several VOCs above Class GA groundwater and NYSDOH drinking water standards. The shallow samples (ranging in depth from between 13 to 29 feet below ground surface) are designated as S1 through S8 (S1-S4 are upgradient and S5-S8 are downgradient). The deep samples (ranging in depth from between 43 to 59 feet below ground surface) are designated as D1 through D8 (D1-D4 are upgradient and D5-D8 are downgradient). The upgradient samples are the shallow and deep samples collected from Geoprobe points 1 through 4, and the downgradient samples are the shallow and deep samples collected from Geoprobe points 5 through 8.

Low levels (levels below or slightly above the standards) of 1,1-dichloroethane (1,1-DCA) were detected in all of the upgradient samples except D3 and D4. Low levels of 1,1,1-trichloroethane (1,1,1-TCA) were also detected in D1, S2, D2 and S4. In general, all of the shallow Geoprobe locations, and 5 of 8 of the deep locations, indicate low levels of VOCs (maximum concentration of total VOCs of 32 ug/l in S7).

The sample collected from D4 exhibited the highest level of VOCs in any of the upgradient samples (total VOCs of 459 ug/l). The compounds detected were primarily tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethene (1,2 DCE) and vinyl chloride.

Based on review of data in the SCDHS files, it appears that the likely source of contamination at Geoprobe location D4 is from the former Baron-Blakeslee (Aircraft Turbine Services) facility, where investigation conducted on-site and off-site detected similar VOCs. In fact, a 1986 Hydrogeologic Investigation and Evaluation of Off-Site Recovery Systems prepared for Aircraft Turbine Services showed a projected contaminant plume from the site crossing the northeast corner of the Sonia Road Landfill in the area of D4.

Based upon the results from D4, similar contaminant levels would be anticipated immediately downgradient of this location. The sample collected from D8 would be the expected downgradient sample based upon a south-southeast groundwater flow direction interpretation. However, the results of the analysis of sample D8 only indicate a trace level of PCE (in addition to 10 ug/l of chloroethane). None of the other compounds detected at elevated levels in D4 were detected in D8.

The results of the analysis for sample D7 are, however, similar to the results of D4. Elevated levels of 1,2-DCE and vinyl chloride, as well as PCE, were detected at this location. This could be a result of an error in sample labeling or handling either in the field or in the laboratory where samples D7 and D8 were inadvertently switched. Another explanation for this unexpected result is the possible "channeling" of groundwater due to the heterogeneity of waste material below the water table. This "channeling" could affect groundwater flow direction in the immediate vicinity of the landfill.

Sample D5 collected on the southwestern portion of the landfill exhibited the highest levels of contamination (total VOCs of 2,471 ug/l). 1,1,1-TCA was detected at 1,400 ug/l. Elevated levels of 1,1-DCA and chloroethane, breakdown products of 1,1,1-TCA, were also detected in this sample. In addition, lower levels of 1,1-DCE and TCE were detected. Based on anticipated groundwater flow direction, a Geoprobe sample may not have been collected directly upgradient of this location. Therefore, although other samples collected upgradient of the landfill (other than D4) do not indicate the presence of these compounds at elevated levels, there is not conclusive evidence that this contamination is emanating from the landfill. There could be an upgradient source of contamination originating from the industrial area located northwest of this landfill.

To address the possibility of an upgradient source of contamination, information is being obtained regarding potential sources to the northwest of the landfill, in particular from the SCDHS files, which provide information on cesspool/dry well sampling and cleanout. Upgradient water quality information from this area is also being obtained from reports from investigations conducted at upgradient sites as well as, if available, SCDHS monitoring wells.

Elevated levels of tentatively identified compounds (TICs) were detected in S7 and S8. These compounds will be further evaluated to determine the potential source of these constituents.

During the review of the preliminary data, it was also noted that all of the deep samples exhibited elevated levels of chromium with 7 of 8 locations exceeding the groundwater standard of 50 ug/l. Elevated levels were detected both upgradient and downgradient of the landfill. Although this would indicate that the contamination results from an upgradient source, (or perhaps from turbid samples, although based on a preliminary review, it appears that the samples were filtered), since plating waste was allegedly disposed at the Sonia Road Landfill, the landfill could be the source of this contamination.

As discussed above, Golder Associates prepared a Hydrogeologic Assessment Report for the Sonia Road Landfill for the Islip Resource Recovery Agency (Agency) on June 1995. The report provides a brief hydrogeologic assessment of existing data, including utilization of data from wells installed upgradient and downgradient of the landfill in 1995. The report also contains a description of groundwater quality and site history. The report also provides recommendations for future actions at the site. The report concluded that there is significant evidence that groundwater at and downgradient from the site is being impacted by upgradient sources. The report recommended that the Agency collect additional information, both upgradient and downgradient of the site, to better define the impact of upgradient sources of contamination.

3.4 Other Background Information

SCDHS files were reviewed in order to obtain information on potential upgradient sources of contamination in the vicinity of the Sonia Road Landfill. As identified in this section, there are several potential upgradient sources of contamination. Additional information on these sources and other potential sources will continue to be obtained throughout the Remedial Investigation. The location of known potential sources are shown on Figure 4. A discussion of these sources is provided below.

3.4.1 Baron-Blakeslee

The former Baron-Blakeslee Site is a United States Environmental Protection Agency (USEPA) National Priorities List (NPL) site located at 86 Cleveland Street. The site is also known as the Aircraft Turbine Services (ATS) Site currently the facility name is UNC Accessory Services. Several reports have been prepared by Woodward-Clyde Consultants for Baron-Blakeslee and by ERM Northeast for ATS. The reports that were reviewed at the office of SCDHS include the following:

1. Baron-Blakeslee, Inc. Engineering Report, Woodward-Clyde 1982.

2. Remedial Action Groundwater Studies, Baron-Blakeslee, Inc., Woodward-Clyde, February 1984.

3. Status Report, Baron-Blakeslee, Inc., Woodward-Clyde, January 24, 1985.

4. Installation and Sampling of Monitoring Wells - Aircraft Turbine Services, Inc. Bay Shore, New York, ERM-Northeast, September 1985.

5. Hydrogeologic Site Assessment - Aircraft Turbine Services, Inc., ERM-Northeast, November 1985.

6. Hydrogeologic Investigation and Evaluation of Off-site Recovery Systems - Aircraft Turbine Systems, ERM-Northeast, February 1986.

Based upon the results of sampling sediment from an on-site catch basin (dry well) by Woodward-Clyde in 1984, elevated levels of TCE (410,000 ug/kg), 1,1,1-TCA (2,700,000 ug/kg), and PCE (66,000 ug/kg) were detected in the sediment. Elevated levels (greater than 10,000 ug/kg) of 1,1-DCA and 1,1- DCE were also detected in this sediment sample.

Based upon a review of the investigations conducted at the site, several groundwater monitoring wells were installed and sampled at the site. In addition, based upon the results of the groundwater samples collected from the on-site wells, a groundwater recovery and treatment system was installed on-site in 1985. On-site pumping and treatment of the contaminated groundwater occurred from 1985 to 1988.

An evaluation was also conducted to determine the need for installation of an off-site groundwater recovery system. Several wells were installed off-site and groundwater samples were collected from these wells. Results of the analysis of a sample collected from an off-site well (ATS-1) in January 1986, indicated the presence of 1,1 DCA at 290 ug/l, 1,2 DCE at 4200 ug/l, 1,1,1 TCA at 950 ug/l, TCE at 110 ug/l and PCE at 140 ug/l. Although these levels of volatile organics were detected in off-site wells, ERM-Northeast recommended not to install an off-site groundwater recovery system.

3.4.2 Dial Ace Uniform Supply

Dial Ace Uniform Supply, Inc. is located at 30 Dunton Avenue. According to SCDHS files, samples were collected from on-site cesspools in 1981 and 1982. Results of these samples indicated the presence of elevated levels of volatile organic compounds, including PCE as high as 2,900 ug/l, 1,1,2-TCE as high as 1,200 ug/l and 1,2,4-trimethylbenzene as high as 37,000 ug/l. As a result of this sampling, nine groundwater monitoring wells were installed in March 1984. Results from the analysis of samples collected from these wells indicated the presence of VOCs, including vinyl chloride as high as 9 ug/l, 1,1,1-TCA as high as 110 ug/l, 1,1,2-TCE as high as 130 ug/l and cis-DCE as high as 92 ug/l.

3.4.3 Chemical Pollution Control

According to the NYSDEC Inactive Hazardous Waste Report dated April 1996, Chemical Pollution Control, Inc. (CPC) is a NYSDEC Class 2a site located at 120 South 4th Street. Chemical Pollution Control operates a commercial storage treatment and transfer facility. Eight tanks are located on site to store and treat hazardous waste including oils, non-halogenated solvents, other ignitable hazardous wastes, organic wastewater and acids.

In 1981, the Suffolk County Department of Health identified ten spills of toxic and hazardous materials at Chemical Pollution Control which may pose a threat to the groundwater.

A Phase I investigation was completed in 1988. A consent order was signed and the responsible party is required to conduct a Phase II investigation. According to NYSDEC, a Phase II report was prepared for the facility and NYSDEC was planning additional off-site assessment work for 1996. According to NYSDEC correspondence, a sample from one of CPC's monitoring wells indicates the presence of volatile organic compounds similar to those found in the groundwater upgradient of the landfill. (The specific compounds were not identified in the letter.)

3.4.4 Commercial Envelope Manufacturing Co., Inc.

Commercial Envelope Manufacturing Co., Inc. (CEM) is located at 900 Grand Boulevard. According to the NYSDEC Inactive Hazardous Waste Disposal Report dated April 1996, the facility is a Class 2a site. Waste generated from the photo and printing operations, as part of their envelope manufacturing, were disposed of into on-site sanitary systems. According to SCDHS sampling, three areas have been identified that contained elevated levels of solvents and heavy metals. These areas include on-site leaching pools, waste storage tanks and an area adjacent to a trash compactor. Contaminants identified include methylene chloride, PCE, toluene, xylene, TCE, cis-DCE, copper, lead and zinc.

According to NYSDEC, in the spring of 1986 a clean up effort was initiated and monitoring wells were installed. A Phase I investigation was completed in June 1987 and additional subsurface investigation is planned.

3.4.5 Southern Container Corporation

Southern Container Corporation is located at 140 Industry Court, Deer Park. The facility manufacturers corrugated boxes. In October 1985, an

oil spill inventory form was prepared to address a spill of starch and ink at the facility. As a result of the spill, approximately 47 cubic yards of soil was contaminated. The report indicated that this soil was excavated and removed off-site.

3.4.6 Optica Manufacturing Corporation

According to SCDHS files, Optica Manufacturing Corporation was located at 210 S. Fehr Way, Bay Shore. The facility performed lens casting manufacturing. As part of this process, methylene chloride and 1,1,1-trichloroethane was used. In July 1986, the SCDHS issued a Notice of Violation to the facility. Samples collected from a sanitary cesspool indicated the presence of 180 ppb of methylene chloride and 65 ppb of toluene. Lens grinding wastes were also disposed of in a dumpster.

3.4.7 Marcisak Printing

Marcisak Printing was an offset printing facility located at 240 S. Fehr Way, Bay Shore. Review of SCDHS files indicated Marcisak Printing was issued several notices of violation between 1984 and 1985 indicating they were discharging waste photochemicals to cesspool. A sample collected from the cesspool indicated the presence of phenols, iron, cadmium and silver. By 1986, discharge to the cesspool ceased.

3.4.8 Island Metal Finishing

Island Metal Finishing was located at 211 B N. Fehr Way, Bay Shore. According to SCDHS files, in 1983 a sample was collected from a sanitary pool on the property. This sample indicated the presence of copper, iron and lead. By November 1983, the facility had moved to a new location.

3.4.9 Local Hydrogeology

As discussed in the Hydrogeologic Assessment Report for the Sonia Road Landfill prepared by Golder Associates, there are two major water bearing units in the site region including the Upper Glacial deposits and the Magothy Formation. The Gardiners Clay Formation is believed to separate the two water bearing units. The 1979 report prepared by SCDHS indicated that the site is underlain by at least 80 feet of "highly permeable sand and gravel." The Gardiners clay was noted at approximately 108 feet below ground surface. The report indicated the thickness of the Gardiners Clay at the site is 9 feet and is located approximately 39 feet below sea level.

According to the NYSDEC IIWA investigation, groundwater was encountered between 10 and 15 feet below ground surface along the northern boundary of the site and approximately 20 to 25 feet below ground surface along the southern boundary.

The Hydrogeologic assessment indicated five monitoring wells were installed around the perimeter of the Landfill and were designated as MW-1, MW-2, MW-3S, MW-3D and MW-4 (see Figure 3) for approximate locations of the monitoring wells). Based upon one round of ground water elevations obtained an approximate groundwater flow direction was identified. This groundwater flow direction was in the south easterly direction. A horizontal gradient of 0.0019 feet per foot was reported as well as a slight upward gradient at the southern portion of the site. Grain size distribution data was utilized to obtain an average permeability of 0.002 ft/sec. Further calculations yielded as estimated groundwater velocity at the site of 0.33 feet/day or about 120 ft/year.

Average groundwater velocities were calculated in the vicinity of the Baron-Blakeslee/ATS site and reported in the ERM - Northeast Report. A rate of 0.95 ft/day or 346 ft/year based on an average hydraulic conductivity of 128 ft/day, a porosity of 0.27 and a hydraulic gradient of 0.002 ft/ft was determined.

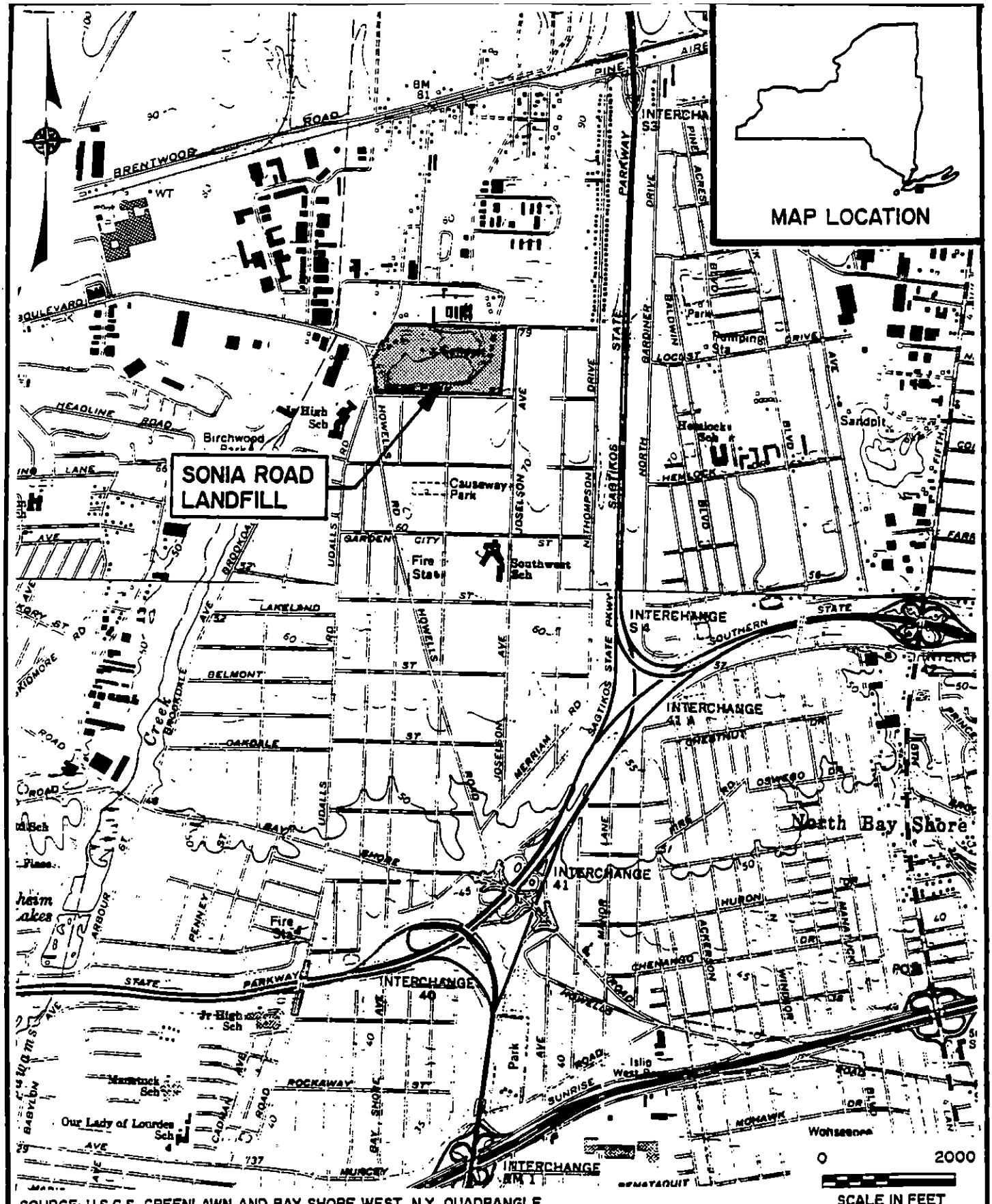
3.4.10 Local Geology

Information obtained from the 1979 SCDHS report indicates that, based on data obtained from two borings constructed in 1974 in the southwestern and northeastern portions of the eastern portion of the landfill, there was at least 29 feet of refuse lying on a natural formation of grayish brown sand. Another boring, also constructed in 1974 on the western portion of the landfill, indicated the presence of at least 35 feet of refuse. Some refuse was encountered 11 feet below the water table.

The refuse encountered in the eastern portion of the landfill consisted of wood, roots, glass, plastic, metal and "general rubbish." In the western portion of the landfill, the refuse has been described as consisting of wood, glass, plastic, metal, cardboard, concrete and household wastes. At the time of boring construction (1974), the landfill was continuing to accept "rubbish, automobile bodies and demolition wastes."

Beneath the waste, the landfill is underlain by unconsolidated glacial outwash deposits of stratified medium to course sand and gravel to a depth of 108 feet. As discussed previously, the thickness of the Gardeners Clay in the vicinity of the landfill is reported to be 9 feet. The Gardiners clay is underlain by the Matawan Group-Magothy Formation

consisting of unconsolidated sand, clayey sand and clay. It is estimated that this formation is approximately 750 feet thick.



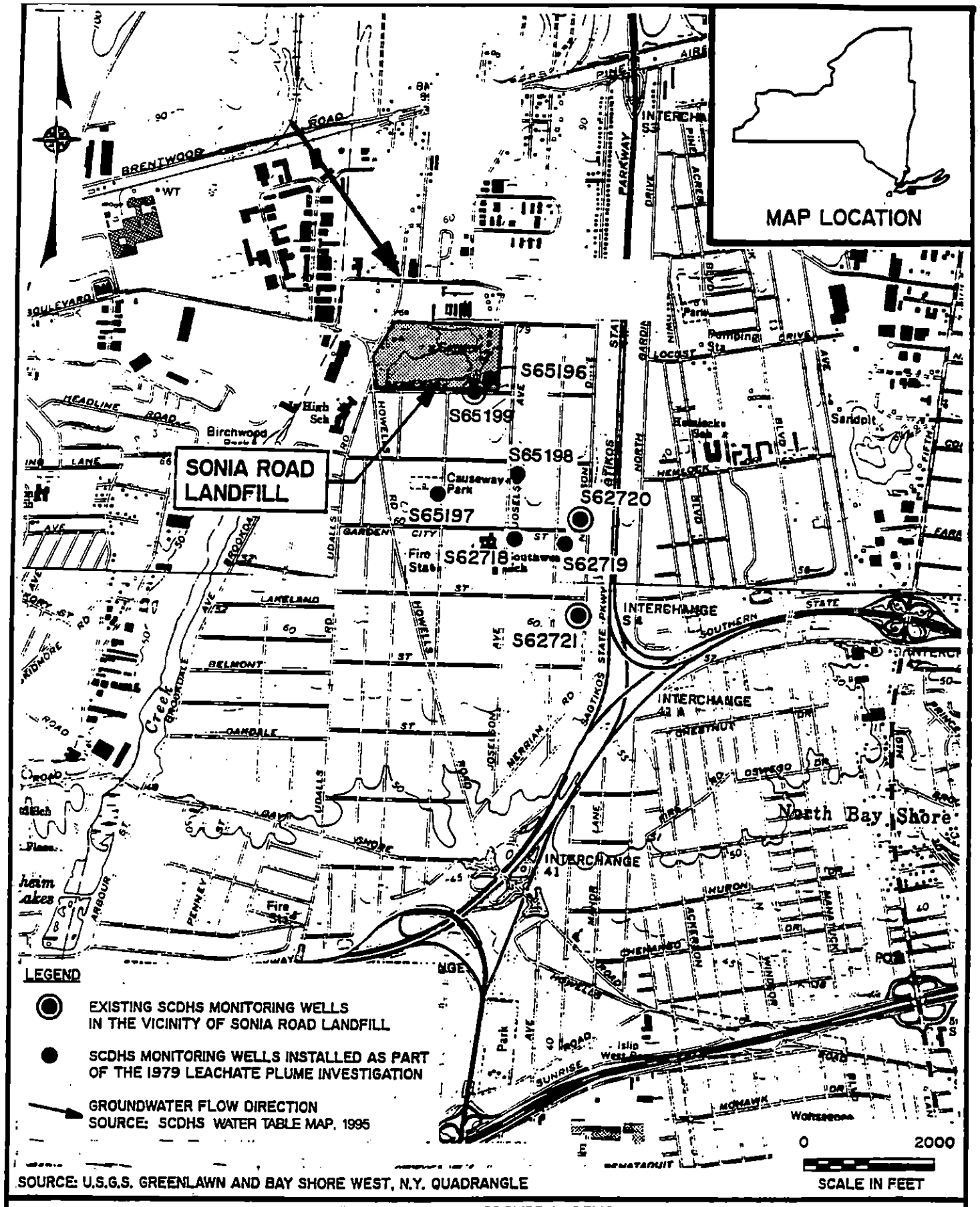
SOURCE: U.S.G.S. GREENLAWN AND BAY SHORE WEST, N.Y. QUADRANGLE

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 1



SOURCE: U.S.G.S. GREENLAWN AND BAY SHORE WEST, N.Y. QUADRANGLE

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL

MONITORING WELL LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers
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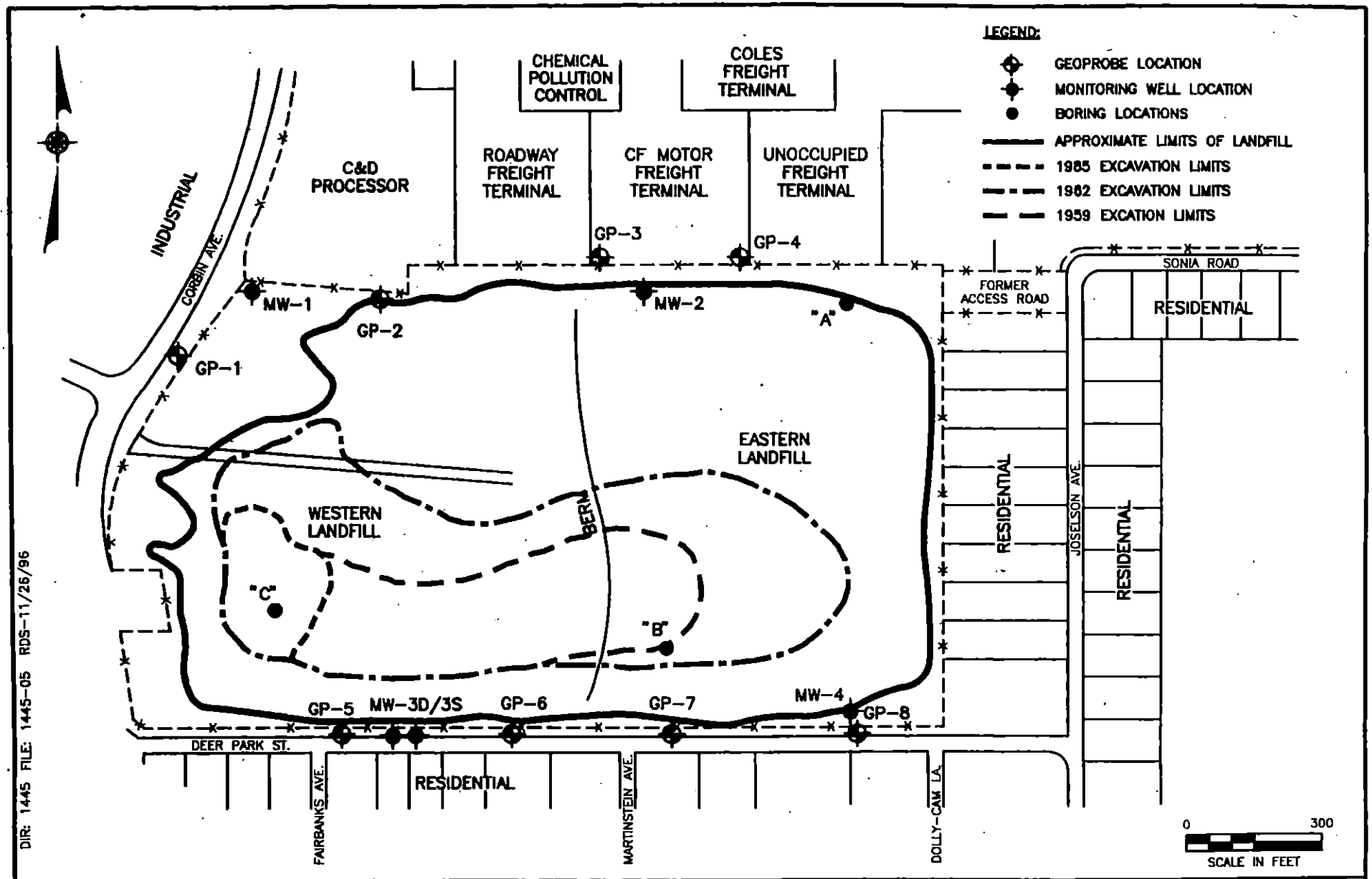
FIGURE 2



ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL

HISTORICAL INFORMATION

Dvirka and Bartilucci
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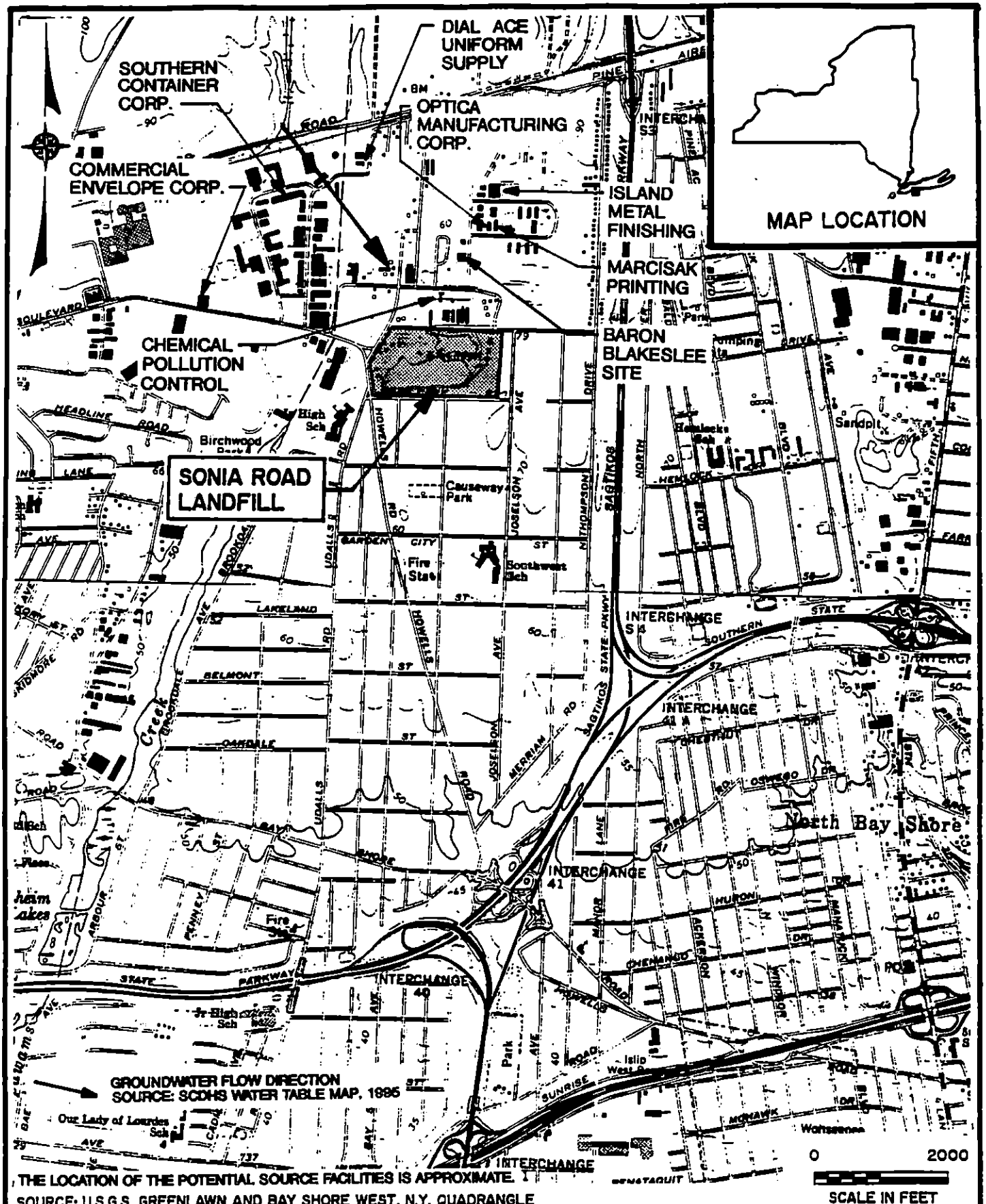
FIGURE 3



THE LOCATION OF THE POTENTIAL SOURCE FACILITIES IS APPROXIMATE.

SOURCE: U.S.G.S. GREENLAWN AND BAY SHORE WEST, N.Y. QUADRANGLE

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL

POTENTIAL UPGRADIENT SOURCE LOCATION MAP

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FIGURE 4

TABLE 1
SONIA ROAD LANDFILL
PRELIMINARY GROUNDWATER SAMPLING RESULTS
VOLATILE ORGANICS
AUGUST 1994

SAMPLE IDENTIFICATION	S1	D1	S2	D2	S3	D3	S4	D4	NYSDOH/SCDHS DRINKINGWATER STANDARDS	NYSDEC CLASS GA GROUNWATER STANDARDS
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	U	U	U	U	U	U	U	33	2 ST	2 ST
Chloroethane	U	U	U	U	U	U	5	U	5 ST	5 ST
1,1-Dichloroethene	U	U	U	U	U	U	U	U	5 ST	5 ST
1,1-Dichloroethane	2	7	4	13	4	U	5	U	5 ST	5 ST
1,2-Dichloroethene	U	U	U	U	U	U	6	170	5 ST	5 ST
1,1,1-Trichloroethane	U	6	1	9	U	U	3	U	5 ST	5 ST
Trichloroethene	U	U	U	U	U	U	9	46	5 ST	5 ST
Benzene	U	U	U	U	U	U	U	U	5 ST	0.7 ST
Tetrachloroethene	U	U	3	U	U	2	5	210	5 ST	5 ST
Chlorobenzene	U	U	U	U	U	U	U	U	5 ST	5 ST
TOTAL VOCs	2	13	8	22	4	2	33	459		

SAMPLE IDENTIFICATION	S5	D5	S6	D6	S7	D7	S8	D8	NYSDOH/SCDHS DRINKINGWATER STANDARDS	NYSDEC CLASS GA GROUNWATER STANDARDS
VOLATILE ORGANICS	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)	(ug/l)
Vinyl Chloride	U	U	U	U	U	63	U	U	2 ST	2 ST
Chloroethane	5	120	16	U	12	U	8	10	5 ST	5 ST
1,1-Dichloroethene	U	140	U	U	U	U	U	U	5 ST	5 ST
1,1-Dichloroethane	U	720	U	4	U	U	U	U	5 ST	5 ST
1,2-Dichloroethene	U	U	U	2	U	140	U	U	5 ST	5 ST
1,1,1-Trichloroethane	U	1400	U	U	U	U	U	U	5 ST	5 ST
Trichloroethene	U	11	U	U	U	U	U	U	5 ST	5 ST
Benzene	U	U	U	U	9	U	4	U	5 ST	0.7 ST
Tetrachloroethene	U	U	U	U	U	7	2	2	5 ST	5 ST
Chlorobenzene	U	U	2	U	11	U	3	3	5 ST	5 ST
TOTAL VOCs	5	2471	18	6	32	210	17	15		

QUALIFIERS
U: Compound analyzed for but not detected
: Exceeds drinking water or groundwater standards

NOTES
ST: Standard

Section 4

Section 5

5.0 HAZARD ASSESSMENT AND RISK ANALYSIS

5.1 Potential Health Hazards

The primary concern is to protect workers from potential exposure to contaminated soils, vapors, groundwater and other contaminated materials when conducting the remedial investigation. In addition to the above mentioned chemical hazards, physical, biological and underground hazards also exist. These hazards are described in more detail in the following sections.

5.1.1 Potential Soil and Groundwater Contaminants

Based on the data available for groundwater samples collected in the vicinity of the Sonia Road Landfill site, the following potential contaminants of concern have been identified:

vinyl chloride	1,1-dichloroethene
trichloroethene (TCE)	chloroethane
tetrachloroethene (PCE)	benzene
1,1,1-trichloroethane (TCA)	chlorobenzene
	chromium
1,2-dichloroethene (DCE)	1,1-dichloroethane (DCA)

In addition to the above contaminants of concerns, methane and hydrogen sulfide are often present at landfill type of sites.

5.1.2 Health Hazard Evaluation

The primary potential health hazards of concern to workers from contaminants are from inhalation of vapors and dusts, and skin exposure to contaminated soil or splashed water. Potential for these exposures exist when conducting field programs using various investigation techniques.

OSHA Permissible Exposure Levels (PELs) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) may be exceeded during investigative activities. Table 5-1 lists the chemicals, PELs, TLVs and primary health hazards. The activities to be performed during remedial investigations are summarized in Section 5.2. These activities will be closely monitored and evaluated to determine the potential for exceeding the standards and the need to implement control measures to protect personnel and the environment.

Table 5-1

PERMISSIBLE EXPOSURE LIMITS (PELS) AND PRIMARY HEALTH HAZARDS FOR POTENTIAL CONTAMINANTS AT THE SITE

Chemical	ACGIH TLV (ppm)	ACGIH STEL* Ceiling (ppm)	OSHA PEL (ppm)	OSHA STEL*/ Ceiling (ppm)	Primary Health Hazards
vinyl chloride	5	---	1 Action Level 0.5	5	Liver, skin, resp. sys., CNS, lymphatic system, confirmed human carcinogen
trichloeoethene	50	100	100	200	Resp. sys., heart, liver, kidneys, CNS, skin
tetrachloroethene	25	100	100	200	Liver, kdineys, eyes, upper resp. system, CNS
1,1,1-trichloroethane	350	450	350	---	CNS, eyes, liver, kidneys, skin, cardiovascular systems
1,2-dichloroethene	200	---	200	---	Eyes, resp. sys., CNS
1, 1-dichloroethane	100	---	100	---	Skin, liver, kidneys, lungs, CNS
1,1-dichloroethene	5	20	---	---	Eyes, skin, resp. system, CNS, liver, kidneys
chloroethane	100	---	1000	---	Liver, kidneys, resp. sys., liver, kidneys, CVS, CNS
benzene	10	---	1	5	Eyes, skin, respiratory system, blood, CNS, bone marrow
chlorobenzene	10	---	75	---	Enes, skin, resp. sys, CNS, liver
chromium (metal)	0.5 mg/m3	---	1 mg/m3	---	Eyes, skin, resp. sys

*STEL (Short Term Exposure Limit): a 15-minute time-weighted-average exposure limit that should not be exceeded at any time during a workday.

5.1.3 Potential Exposures

Potential contaminated materials include soil, groundwater, waste, sludge, and vapors. The expected risk of exposure to these chemicals would be from inhalation, ingestion, skin or eye contact with volatile compounds, contaminated dusts, etc. Potential exposure can be mitigated through appropriate investigation procedures, work practices, air monitoring and personal protective equipment. All personnel relate to the investigation will keep upwind of all soil disturbances and sampling activities at all times, when possible. Good workpractice will be implemented to avoid dust generation. In addition, splashing of liquids should be minimized by employing careful handling practices.

5.1.3 Physical Hazards *(This is not an inclusive list- so BEWARE!)*

- Weather conditions-lightning, rain, hurricanes, etc.
- Slips, trips, falls
- Heavy equipment such as drill rig
- Striking and struck-by (heavy equipment)
- Noise
- Cold stress (see Appendix B)
- Heat stress (see Appendix C)

5.1.4 Biological Hazards

Potential biological hazards may include, but are not limited to, ticks, microbiological agents (molds and fungi), poison plants, animals and rodents.

5.2 Activity Safety and Health Hazard Analysis

Field activities for the remedial investigation at Sonia Road Landfill will include the following:

- grid network survey
- surface soil sampling
- soil vapor survey
- test trench/pit construction
- on-site test borings
- upgradient monitoring wells
- perimeter hydropunch/groundwater screening points
- on-site/perimeter monitoring wells
- downgradient monitoring wells
- monitoring well groundwater sampling
- water level measurements

- public/private well survey

With the installation of groundwater monitoring wells and soil borings, soil and groundwater sampling, test pit excavations, and other survey activities during the investigation, some inherent safety risks may be expected. There is the potential for mechanical and physical struck-by hazards associated with the equipment and sampling activities. There are also potential electrical hazards from underground lines, overhead lines and use of electrical equipment and tools. The protection of underground utilities is promulgated under New York State Department of Labor Industrial Code 53.

The direct handling of contaminated drums, containers or concentrated chemicals is not expected during the investigation. In the event that such materials are encountered during the field program, the operation will cease and the uncovered drum which have been damaged will be immediately covered with soil to minimize release of volatile compounds. This condition will be recorded and reported to the Islip Resource Recovery Agency and Town of Islip, and the field team will be instructed to secure the area until health and safety risks are properly assessed and further actions are determined.

The investigative activities including test pit/trench construction, and monitoring well construction to be conducted during the remedial investigation represents a moderate* health risk given the potential to encounter contaminated material. The risk associated with physical hazards while conducting these investigative activities is moderate to high*. Potential levels of airborne contaminants may dictate use of appropriate personal protective equipment as deemed necessary by the HSO. (*The risk ratings represent a qualitative description of probabilities for encountering the hazards. low - not likely to occur. moderate - likely to occur. high - very likely to occur.)

Proper wearing of protective equipment and employment of stringent personal hygiene practices should reduce potential health hazards.

Restricting access of on-site personnel to all equipment operations, maintaining safe distances from equipment, and wearing proper safety equipment will reduce risk of injuries. Underground utilities should also be identified before any digging related work is conducted.

6.0 TRAINING REQUIREMENTS

6.1 General Health and Safety Training

6.1.1 All on-site personnel who are assigned to work in or enter into the Exclusion Zone or the Contaminant Reduction Zone (see Section 10.0) must be trained in accordance with 29 CFR 1910.120. This training will be required for personnel performing or supervising work; for health, safety, security, or administrative purposes; for maintenance; or for any other site related function. These training requirements also apply to site visitors who enter the Exclusion Zone or the Contaminant Reduction Zone (see Section 10.0 for clarification).

6.1.2 The training shall include a minimum of forty hours of general health and safety training and three days of on-site supervised experience. Documentation of all such training shall be made available to the HSO before any person shall be allowed to enter any potentially contaminated area (namely, the Exclusion Zone or the Contaminant Reduction Zone).

6.2 Site Specific Training

6.2.1 All site personnel shall attend a site specific refresher training program performed by the on-site HSO and become familiar with the SHSP and certify their understanding of this plan (see Appendix D). This training program shall include, at a minimum, training in the following areas:

- Hazard analysis (chemical/physical hazards).
- Standard safety operating procedures.
- Personal hygiene.
- Safety equipment to be used.
- Personal protective equipment to be worn including care, use, and proper fitting.
- Decontamination procedures.
- Areas of restricted access and prohibitions in work areas.
- Emergency procedures and plans.
- Respiratory equipment training and qualitative fit-testing protocols (banana oil and irritant smoke).
- First aid procedures.
- On-site and off-site communications.
- Hazardous materials handling procedures.
- Air monitoring instrumentation use and calibration.
- Sample collection.
- Hazardous materials recognition.

- The "Buddy System" to be used at the site.

6.2.2 Training sessions for visitors entering the Exclusion and Contaminant Reduction Zones shall be conducted by the HSO. See Section 10.1 for descriptions of the exclusion and contaminant reduction zones. Abbreviated awareness training for visitors who remain in the Support Zone will also be provided by the HSO.

6.2.3 Safety and health meetings shall be conducted at the initiation of the project by the HSO for all personnel assigned to work at the site. (See Appendix E for Safety Meeting record.)

6.2.4 Proof of training for all D&B personnel can be found in Appendix F. Personnel who have not successfully completed the required training shall not be permitted to enter the Exclusion Zone or the Contaminant Reduction Zone.

6.2.5 Daily "Tool Box" safety meetings shall be conducted to keep all on-site personnel aware of current safety and health hazards and changes to work site conditions. Any modifications that the HSO makes to the SHSP will be communicated to personnel at this time

6.2.6 New Employees involved in hazardous activities shall be indoctrinated by the HSO prior to entering the site to work. All training requirements must be completed by a new employee prior to indoctrination. Indoctrination will be comprised of the site-specific refresher training program, the task/operation safety and health risk analysis, and the phased accident prevention plan. This training shall be documented in the Site Worker Training and Medical Examination Record (Appendix F).

Section 7

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 General

All on-site personnel shall have appropriate PPE. All PPE is to be used properly and protective clothing is to be kept clean and well maintained. The HSO shall maintain constant communication with on-site personnel when conducting air monitoring and consult the Certified Industrial Hygienist if necessary with regard to "action levels" at which the specified minimum levels of protection are either upgraded or downgraded based upon air monitoring results and direct contact potential. The HSO has the authority to require the use of additional equipment, if necessary, for specific operations, or may tailor PPE specifications to best fit the hazard control requirements as appropriate. Action levels are defined in Section 9 and are summarized in Table 9-1.

7.2 General Site Safety Equipment Requirements

This is the basic work uniform and will primarily be worn outside the Exclusion Zone and the Contaminant Reduction Zone at the Sonia Road Landfill Site.

7.2.1 Equipment

- Coveralls. (Optional, may be disposable type).
- Boots/shoes - (OSHA compliant construction footwear)
- Hard hat with splash shield - ANSI approved.
- Gloves (optional).
- Safety glasses - ANSI approved.

7.2.2 Each work task performed on-site will require some level of personal protection for each person. See Table 7-1 for a listing of PPE requirements. Each level of protection is discussed below.

7.3 Level D Protection

Level D protection initially shall be worn in the Exclusion Zone and Contaminant Reduction Zone during non-intrusive sampling and investigative activities, and equipment shall be selected by the HSO from the equipment in section 7.3.1. (All personnel conducting work within the landfill will be required to wear coveralls-tyvek or equivalent. All personnel conducting work outside the limits of the will be required to wear coveralls at the discretion of the HSO.) The HSO will determine appropriate protective equipment as deemed necessary for specific site operations.

7.3.1 Equipment

- One or two piece disposable suit, PE-tyvek or equivalent.
- Gloves - Outer (minimum 11mil. nitrile or equivalent); Inner (latex).
- Boots - Outer (neoprene or equivalent); Inner (steel toe and shank) or equivalent combination (ANSI approved).
- Safety glasses or goggles (ANSI approved).
- Hard hat with splash shield, if needed (ANSI approved).
- Hearing protection (if work is near heavy or noisy equipment)

7.4 Level C Protection

Level C protection shall be selected when a modified level of respiratory protection is needed. Selection shall be made when air monitoring results of the site or individual work areas exceed the action level criteria.

7.4.1 Equipment

- Full facepiece, air purifying respirator with combination organic vapor and high efficiency particulate air (HEPA) cartridges (OSHA/NIOSH approved).
- Hooded one or two piece chemical resistant suit, PE - Tyvek or equivalent (modification of protective suits may be made upon the approval of the HSO).
- Gloves - Outer (minimum 11mil nitrile or equivalent); Inner (latex).
- Boots - Outer (neoprene or equivalent); Inner (steel toe and shank) or equivalent combination (ANSI approved).
- Two way radio communications (for remote operations).
- Hard hat with splash shield (ANSI approved).
- Hearing protection (if work is near heavy or noisy equipment)

7.5 Level B Protection

Level B protection requires full chemical resistant clothing with a full facepiece SCBA or supplied air respirator. Generally, this level of protection is not expected for this project. However, provision will be made to have this equipment available should its use be determined to be required. Investigation activities which may result in this level of protection being required will not be implemented until the equipment has been transported to the site. The HSO will be notified should air monitoring indicate this level of protection is required. Implementation of Level B protection will only be performed when sufficiently trained

personnel (minimum of two) are available on-site.

7.6 Confined Spaces

Under no circumstances will confined spaces be entered unless discussed with the Project Director and HSO, and the HASP is prepared to incorporate additional safety requirements, and all personnel are trained appropriately to deal with confined space hazards.

7.6 Standing Orders

7.6.1 All prescription eyeglasses in use on the site shall be safety glasses. Prescription lens inserts shall be provided or personal contact lenses may be used for full-face respirators. All eye and face protection shall conform to OSHA 1910.133.

7.6.2 Programs for respiratory protection shall conform to OSHA 1910.134 and ANSI Z88.2-1980. A respiratory program addressing site specific respirator care and cleaning is described in Appendix F.

7.6.3 Personnel unable to pass a fit-test shall not enter or work in the Exclusion Zone or Contaminant Reduction Zone.

7.6.4 Each respirator shall be individually assigned and not interchanged between workers without cleaning and sanitizing. Cartridges/canisters and filters shall be changed daily or upon breakthrough, whichever occurs first. If breakthrough occurs, a reevaluation by the HSO of the protection level is warranted. A procedure for assuring periodic cleaning, maintenance, and change of filters shall be followed by each respirator wearer. This procedure is described in Appendix G - Respiratory Cleaning and Maintenance Procedure.

7.6.5 A hard hat shall be worn by all personnel. All head protection shall conform to the requirements in OSHA 1910.135.

7.6.6 All Level D or C personal protective equipment worn on-site shall be decontaminated before being reissued. Disposable equipment shall be properly disposed of (as contaminated solid waste) at the end of the work day in the Personnel Decontamination Area. The HSO is responsible for ensuring all personal protective equipment is decontaminated before being reissued (see Section 11.0).

7.6.7 All safety boots shall conform to OSHA 1910.136.

7.6.8 Power equipment may generate excessive noise levels (in excess of 85 decibels). Proper ear protection shall be provided and used in accordance with OSHA 1926.52

TABLE 7-1
PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

LEVEL OF WORK TASK	LEVEL OF PROTECTION*	SPECIFIC PPE**
Restricted Zone/Support Zone Operations	D	Work clothes, hard hat, safety glasses with side shields, steel toe work shoes or boots
Drilling/Sampling/Air Monitoring Inside Exclusion Zone	D, C, or B	Same level as above but with liquid-proof resistant coverall, gloves, rubber boots, full-face air-purifying respirators with organic vapor/HEPA cartridges
Emergency Entry	B	Same protective clothing, gloves and boots as above but with self-containing breathing apparatus (SCBA) pressure demand

* Level of protection may be modified by the HSO dependent upon air monitoring and visual observations

** Specific combinations of PPE will be determined by the HSO and will depend upon specific job assignment of worker. Proper use of respiratory protection, including mask cleaning, disinfection, inspection and maintenance, will be enforced. All contaminated clothing will be disposed of in accordance with the procedures in Section 11.0 of this plan.

8.0 MEDICAL SURVEILLANCE

All personnel entering the Exclusion Zone and/or the Contaminant Reduction Zone must have satisfactorily completed a comprehensive medical examination prior to the initiation of hazardous waste operations at the Sonia Road Landfill Site.

Medical examinations are not required for people making periodic deliveries provided they do not enter Exclusion or Contamination Reduction Zones.

The date of physical examination of each site worker is documented in Appendix E - Site Worker Training and Medical Examination Record. A specific Medical Data Sheet for each individual will be filled with the HSO on-site prior to commencing operations. See Appendix H for Medical Data Sheet.

All contractor personnel who will enter the Exclusion Zone or the Contaminant Reduction Zone shall be provided with medical surveillance prior to their participation in work (entrance examination), and after the conclusion of the on-site personnel's participation in work (exit examination). No personnel shall perform work on another hazardous waste site between entrance and exit examinations, unless specifically approved by the HSO.

8.1 Medical Surveillance Protocol

8.1.1 Medical surveillance protocol is the physician's responsibility but shall meet the requirements of OSHA Standard 29 CFR 1910.120 for all personnel. The protocol shall be selected by the physician.

8.1.2 Additional clinical tests may be included at the discretion of the attending Physician performing the medical examination.

8.2 Non-Scheduled Medical Examinations

The scope of the Non-Scheduled Medical Examinations shall be determined by the physician.

8.2.1 Non-scheduled medical examinations shall be conducted under the following circumstances:

- After acute exposure to any toxic or hazardous material.
- At the discretion of the HSO and/or the Physician, when an employee has been exposed to potentially dangerous levels of toxic or hazardous materials.
- At the discretion of the HSO and/or the Physician, and at the request of an employee with demonstrated symptoms of exposure to toxic or hazardous materials.

8.3 Documentation and Recordkeeping

8.3.1 The examining Physician shall notify the HSO in writing that the individual has received a medical examination and shall advise as to any specific limitations upon such individual's ability to work at the project site which were identified as a result of the examination. Appropriate action shall be taken in light of the advice given pursuant to this paragraph.

8.3.2 The ability of on-site personnel to wear respiratory protection during hazardous waste activities shall be certified by the Physician. Cardiopulmonary system examination and pulmonary function testing are minimum requirements.

8.3.3 The Physician shall maintain and provide access for employees to his medical surveillance records according to OSHA requirement (29 CFR 1910.20). These records shall be maintained for a period of 40 years.

Section 9

9.0 ENVIRONMENTAL AND PERSONAL MONITORING PROGRAM

9.1 General

In order to protect site workers from harmful levels of airborne toxic materials, potentially explosive environmental, or excessively cold conditions, regular environmental and personnel monitoring may be accomplished to document exposures and to decide when to increase protective measures.

9.2 Air Monitoring

Particular phases of work or tasks may require the utilization of specific air monitoring equipment to detect relative levels of contaminants or identify unknown environments.

Air monitoring will be conducted continuously by the HSO for the express purpose of safe-guarding the health and welfare of site workers and the general public residing in the vicinity of the Sonia Road Landfill Site. The on-site air monitoring will include using direct reading air monitoring equipment.

- Photoionization Detector fitted with a 10.6 eV lamp, or approved equal.
- Combustible gas, hydrogen sulfide and carbon monoxide meter.
- Drager gas detector tubes for detecting specific hydrocarbons (e.g. vinyl chloride and benzene) should PID reading exceed 1 ppm

9.2.1 Work Zone Air Monitoring

The primary areas or zones to be monitored during the project are the work zones established around sampling, drilling or excavation locations. Monitoring will be documented within these work zones and at the site perimeter. Air monitoring conducted at the sampling locales will focus on worker's breathing zones and may include personal breathing zone samples. Air monitoring just outside of these locations will consist of instruments attempting to quantify the types and degrees of emissions originating from sampling sites.

❑ Exclusion Zone Air Monitoring

Air monitoring conducted in the Exclusion Zone will focus on real time measurement of toxic compounds that pose inhalation hazards, levels of flammable compounds for explosive hazards, and oxygen deficient atmospheres. A

summary of the action levels are provided in Table 9-1.

General visual observation shall also be used during all intrusive activities to identify airborne releases (vapors, smoke, etc.) changes in the coloration of excavated materials, changes to the structural integrity of the surface or mechanical integrity of the equipment. Should such conditions be noticed or encountered, work shall be halted, and the area evacuated until such time the D&B FOM can be contacted and specific procedures for characterizing and handling the hazard can be developed.

The HSO, or his on-site designee, shall observe site conditions daily with special attention to the aforementioned conditions. Depending on site conditions, additional personal protection measures shall be implemented during the course of site work.

- **Perimeter Air Monitoring**

Air monitoring will be accomplished at the upwind and downwind perimeter of the drilling and sampling locations, if deemed necessary by the HSO, to document real time levels of contaminants which might be moving off-site.

- **Background Air Monitoring**

Background air monitoring will be conducted prior to the start of work each day. Contaminant levels shall be obtained at the upwind site perimeter of the Exclusion Zone. Wind direction will be determined prior to initiation of investigative activities. This background data must be annotated on the appropriate air sampling forms for that day.

- **Duration, Frequency, and Protocol**

Monitoring is required continuously or as deemed necessary by the HSO, during all activities in the Exclusion Zone, particularly during intrusive activities. The HSO may modify the work zone sampling frequency upon review of previously analyzed work zone samples.

9.3 Cold Stress Monitoring

Cold Stress guidelines are described in detail in Appendix B.

9.4 Heat Stress Monitoring

Heat stress guidelines are described in detail in Appendix C.

9.5 Quality Assurance and Control

All monitoring instruments will be protected from surface contamination during use to allow easy decontamination. All instrumentation shall be calibrated before and after use and operational checks conducted periodically in the field over the duration of the day's field activities.

9.5.1 The following data shall be recorded by the HSO on the Air Monitoring Data form:

- Date and time of monitoring;
- air monitoring location;
- instrument, model #, serial #;
- calibration/background levels;
- results of monitoring; and
- HSO signature.

Note: See Appendix I for Air Monitoring Results Form

9.5.2 Interpretation of the data and any further recommendations shall be made by the HSO.

9.5.3 Air monitoring results shall be given verbally to D&B FOM following each site scan that indicates contaminant concentrations in excess of the action levels. Results will then be documented in writing and provided to the D&B FOM by the end at work day.

Table 9-1

ACTION LEVELS FOR REMEDIAL INVESTIGATIONS

Action Level	Action To Be Taken
PID	
Background	Level D
Background to 5 units* above background in breathing zone, and no vinyl chloride or benzene present	Halt work, evacuate area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to Level C protection if required upon approval by HSO and FOM.
Greater than 5 units* above background in breathing zone, and no vinyl chloride or benzene present	Halt work, evacuate work area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to Level B protection if required upon approval by HSO and FOM.
DRAGER CALORIMETRIC TUBE	
Positive color change for vinyl chloride or benzene <0.5 ppm	Halt work, evacuate area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to Level C protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene 0.5-1.0 ppm	Halt work, evacuate work area and allow area to ventilate prior to resuming work. Should levels persist, upgrade to Level B protection if required upon approval by HSO and FOM.
Vinyl chloride or benzene > 1 ppm	Shut down work activities. Monitor site to check for off-site migration.
COMBUSTIBLE GAS METER	
Greater that 10% Lower Explosive Limit (LEL)	Halt work, evacuate area and allow area to ventilate to below 10% LEL prior to resuming work. Notify FOM.

Action Level	Action To Be Taken
OXYGEN	
Less than 20.5%	Continuous monitoring. Consider engineering controls.
Less than 19.5%	Evacuate work area. Institute ventilation and engineering controls. Maintain site conditions for at least 15 minutes before proceeding. Notify FOM.
Greater than 22%	Continuous monitoring and identify combustion sources.
Greater than 23.5	Evacuate and institute engineering controls as necessary before proceeding. Explosive condition may be present. Notify FOM.
HYDROGEN SULFIDE	
Less than 10 ppm at breathing zone	Level D and continuos monitoring
Above 10 ppm at breathing zone	Halt work, evacuate area and allow area to ventilate to below 10 ppm. If levels persist, upgrade to Level B protection if required upon approval by HSO and FOM.

* **Units equal total ionizable organic/inorganic vapors and gases**

** **Reading sustained for one (1) minute (60 seconds) or longer**

10.0 SITE CONTROL MEASURES

10.1 Work Zones

Those tasks discussed previously in Section 5.0 will be subject to zonation. The Restricted Zone (RZ) will be identified by D&B as the area within which all project operations take place. At each drilling and sampling site, three work areas shall be established: the Exclusion Zone (EZ), Contaminant Reduction Zone (CRZ), and Support Zone (SZ). Only project related personnel will be allowed in the RZ. As long as an Exclusion Zone exists, a five foot wide (or distance determined by the HSO) strip of land bordering the EZ will be considered the CRZ if applicable. In addition to this strip of land, a specially demarcated area that connects the decontamination area to the CRZ will also be treated as an extension of the CRZ. All other areas inside the restricted area that are not an active Exclusion or Contaminant Reduction Zone will be treated as a Support Zone. Detailed explanations of each Zone are provided below.

10.1.1 Restricted Zone

The Restricted Zone (RZ) is the area within which project operations take place. The RZ includes three areas: The Exclusion Zone, the Contaminant Reduction Zone, and the Support Zone. Only project related personnel will be authorized to be in the RZ.

10.1.2 Exclusion Zone

The Exclusion Zone includes the intrusive activities and isolates the area of contaminant generation and restricts (to the extent possible) the spread of contamination from active areas of the site to support areas and off-site locations. This area will encompass all intrusive work. The Exclusion Zone is demarcated by the Hot Line (i.e.; a tape or rope line or physical barrier). Personnel entering the Exclusion Zone must:

- enter through a controlled access point (the Contaminant Reduction Zone),
- wear the prescribed level of protection (see Section 7.0), and
- be authorized to enter the Exclusion Zone (see Section 4.0, 6.0, and 8.0).

Any personnel, equipment, or materials exiting the Exclusion Zone will be considered contaminated. The HSO shall determine by visual inspection site personal requiring

decontamination. Equipment and materials will either be subject to decontamination or containerized in uncontaminated devices as deemed necessary by the HSO. The HSO will consult the D&B Project Director or Manager to assure compliance with work plan specifications concerning decontamination issues.

Specific access for emergency services to areas of specific site operations will be established by the HSO prior to commencing any operation. The delineated area of the Exclusion Zone may vary with task. (See Section 5.0 for specific task descriptions and the levels of protection used will range from Level D to Level B.)

10.1.3 Contaminant Reduction Zone

Moving upwind from the Exclusion Zone, starting at the Hot Line and continuing to the Contaminant Control Line is the Contaminant Reduction Zone. This zone will border the Exclusion Zone and extend a distance of 20 feet in width, or as deemed necessary by the HSO. The Contaminant Reduction Zone is a transition zone between contaminated and uncontaminated areas of the site. When contaminated personnel, equipment, or materials cross the Hot Line, they are assumed to be contaminated from site operations. Being subjected to the decontamination process, they become less contaminated; when they reach the Contaminant Control Line, they are considered clean and can exit this zone without spreading contamination.

Within the Contaminant Reduction Zone is the Contaminant Reduction Corridor (CRC), where materials necessary for personnel and equipment decontamination are kept. A separate area shall be established for heavy equipment decontamination. In addition, certain safety equipment (e.g.; emergency eye wash, fire extinguisher, and first aid kit) are staged in this zone.

The level of protection to be used within the Contaminant Reduction Zone will normally be Level D. However, the HSO shall determine appropriate levels of protection based upon air monitoring readings, and visual inspection of personnel, and equipment operations in the Contaminant Reduction and Exclusion Zones. Equipment operators (cranes & trucks) physically performing tasks outside the CRC may be exempt from this requirement as approved by the HSO.

10.1.4 Support Zone

The Support Zone is the outermost zone of the site, separated from the Contaminant Reduction Zone by the Contamination Control Line; it is considered a clean area. Movement of personnel and materials from this zone into restricted areas and the Contaminant Reduction Zone will be through access points controlled by the HSO.

The Support Zone contains the necessary storage of equipment, stockpiling of material and support facilities (including personal hygiene facilities) for site operations. Eating, drinking, and smoking will be allowed only in this zone. It also contains the command post, communications center, security check point and source of emergency assistance for operations in the Exclusion Zone and Contaminant Reduction Zone. A log of all persons entering the site will be maintained by the HSO.

The level of protection used in this zone is general site safety equipment (see Section 7.0).

10.2 Drilling Excavation Operations Start-up

10.2.1 The location and depth of each bore hole/testpit/trench will be determined on-site.

10.2.2 Staging for excavation material will be determined prior to commencing drilling/excavation operations.

10.2.3 No personnel will be positioned downwind during drilling/excavation operations.

10.2.4 Location of staging area for support equipment (i.e.; air bottles) will be determined on-site however, it must be upwind and in close proximity to the Exclusion Zone.

10.2.5 The hollow-stem augers, drilling rods, bucket and drill cuttings shall be thoroughly wetted with water to limit airborne releases.

10.2.6 The driller will then decontaminate equipment and the HSO will survey the rig/excavator for any contamination prior to drilling the next hole.

10.3 Buddy System

10.3.1 All on-site personnel shall utilize a buddy system when any task performed at the Sonia Road Landfill Site requires:

- Personnel to assist in completing an activity.
- Intrusive work performed in the Exclusion Zone (e.g.; drilling, boring, etc.).
- The use of protective clothing.
- Communication between the Exclusion Zone and outside the

Exclusion Zone.

10.3.2 The HSO and FOM shall enforce the buddy system and has the authority to modify the criteria stated above to deal with changing site specific and environmental conditions.

10.3.3 In order to ensure that help will be provided in an emergency, all on-site personnel shall be in line-of-sight contact or in communication by radio with the HSO when working in the Exclusion Zone.

10.4 Site Communications Plan

10.4.1 Internal communications will be used by on-site supervisory personnel.

10.4.2 The HSO shall ensure all site personnel are trained to use internal communications to:

- alert personnel on-site of emergencies;
- pass along safety information (such as for heat stress, cold stress control, or rest period time, etc.);
- changes in work scope, scheduling or sequencing of operations; and
- maintain site control (such as notification of vandalism, intruders, or violations of SHSP protocol).

10.4.3 Verbal communications and hand signals shall be used for all tasks of the Sonia Road Landfill Project. However, for those tasks performed in Level D or Level C, radio communications may be used.

10.4.4 Any Exclusion Zone work activity being performed out of the line of sight of the HSO, may require use of radio communications. The HSO may designate a radio operator at the location where the work activity is being performed.

10.4.5 Air horns shall be positioned at any Exclusion Zone work area to be used for emergency response only. The HSO shall designate air horn blast sequences for identification of work location, type of emergency, and need for evacuation of all personnel .

10.4.6 Wind direction indicators shall be installed such that a line-of-sight is maintained with all personnel in all work zones. The HSO shall designate specific locations for wind direction

indicators.

10.4.7 All moving machinery, bulldozers, cranes, dump trucks, etc. shall have working backup alarms.

10.4.8 External communications (outside the Sonia Road Landfill Site) shall be maintained and be used to coordinate emergency response, report to management, and maintain contact with essential off-site personnel.

10.4.9 All on-site personnel shall be informed of external communications hardware (such as telephone, etc.) and the necessary telephone numbers to contact in the event of an emergency situation (fire, police, ambulance, etc.).

10.4.10 All emergency numbers shall be posted in the command post (see Appendix A for listing of important telephone numbers).

10.4.11 Appropriate action shall be taken should any hazardous environmental condition be observed on site. These conditions and the appropriate action to be taken as follows:

OBSERVATION	ANTICIPATED HAZARD	ACTION
Muddy Condition	Personnel/Slip Equipment Instability	Monitor Work Until Condition Improves
Lightning	Electrocution	Stop Work Until Condition Subsides
Horn Blasts or Other Notification by Site Personnel	Site Emergency	Stop Work - Evacuate site Follow Emergency Notification Procedures
Personal Injury	Other Personnel May Be Affected	Follow Emergency Notification Procedures
Personal Fatigue	Cold Stress	Follow Cold Stress Guidelines
Windy Condition	Overhead Hazards Visual Impairment	Stop Work Until Condition Subsides

10.5 Medical Assistance (see Appendix A for complete listing of emergency contacts)

The primary source of medical assistance for the Sonia Road Landfill Site is:

Good Samaritan Hospital

Location: 100 Montauk Turnpike, West Islip, NY
Telephone: 516-376-3000

See Figure 5 for Hospital Route Map.

EMERGENCY TELEPHONE NUMBERS

AGENT/FACILITY	TELEPHONE	EMERGENCY
Emergency Medical Services (Ambulance)		911
Police Department		911
Fire Department		911
Hospital	516-376-3000	
D&B H&S Officer	(516) 364-9892	
FSC Headquarters	(203) 457-2100	

ON-SITE FIRST AID EQUIPMENT

A first aid kit will be available at the site

EMERGENCY MEDICAL INFORMATION FOR SUBSTANCES PRESENT

Substance	Exposure Symptoms	First Aid
VOCs	Dermal: Irritation	Rinse affected area with water
	Inhalation: Dizziness, Nausea	Ventilate, artificial respiration
H_2S	Inhalation: Irritation	Ventilate, artificial respiration
Methane	Inhalation: Dizziness, Nausea	Ventilate, artificial respiration

TOWN OF ISLIP
SONIA ROAD LANDFILL

MEDICAL EMERGENCY ROUTE

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 5

GENERAL EMERGENCY PROCEDURES

The following standard emergency procedures will be used by on-site personnel. The HSO shall be notified of any on-site emergencies and shall be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury: Administer first aid and/or CPR, and arrange for medical attention

Fire/Explosion: The fire department shall be alerted by the field engineer. Personnel shall move a safe distance form the involved area.

10.6 Safe Work Practices

Workers are expected to adhere to established safe work practices for their respective specialties. The need to exercise caution in the performance of specific work tasks is made more acute due to:

- physical, chemical, and toxicological properties of contaminated material present;
- other types of hazards present, such as heavy equipment, falling objects, loss of balance or tripping;
- weather restrictions;
- restricted mobility and reduced peripheral vision caused by the protective gear itself;
- the need to maintain the integrity of the protective gear; and
- the increased difficulty in communicating caused by respirators.

Work at the site will be conducted according to established protocols and guidelines as contained in this document for the safety and health of all involved. Among the most important of these principles for working at the Sonia Road Landfill Site are the following:

10.6.1 General

- In any unknown situation, always assume the worst conditions and plan responses accordingly.
- Because no personal protective equipment is 100 percent effective, all personnel must minimize contact with contaminated materials. Plan work areas, decontamination areas, and procedures accordingly.
- Smoking, eating, chewing gum or tobacco, or drinking in the Contaminant Reduction Zone and the Exclusion Zone will not be allowed. Oral ingestion of contaminants is the second most likely means of introducing toxic substances

into the body (inhalation is the first).

- Work breaks should be planned to prevent stress related accidents or fatigue related to wearing protective gear.
- Medicine and alcohol can potentate the effects from exposure to toxic chemicals and cold stress. Prescribed drugs should not be taken if working in the Contaminant Reduction Zone or Exclusion Zone, unless approval has been given by the physician. Alcoholic beverage consumption shall be prohibited on the site.
- Personnel must be observant of not only one's own immediate surrounding, but also those of others. Everyone will be working under constraints, therefore, a team effort is needed to notice and warn of impending dangerous situations. Extra precautions are necessary when working near heavy equipment and while utilizing personal protective gear because vision, hearing, and communication will be restricted.
- Contact lenses are not allowed to be worn on site; if corrosive or lachrymose substances enter the eyes, proper flushing is impeded.
- All facial hair that interferes with the respirator facepiece fit, must be removed prior to donning a respirator for all tasks requiring **Level C** or **Level B** protection.
- Personnel must be aware that chemical contaminants may mimic or enhance symptoms of other illnesses or intoxication. Avoid excess use of alcohol or working while ill during the duration of task assignment.
- The HSO will maintain records in a bound notebook (e.g.; daily activities, meetings, incidents, and data). Notebooks will remain on-site for the duration of the project so that other safety and health personnel may add information, thereby maintaining continuity. These notebooks and daily records will become part of the permanent project file.

10.6.2 Site Personnel

- All personnel at the Sonia Road Landfill Site shall be identified to the HSO.
- All personnel operating in respective work zones shall dress according to the protection levels set forth in this SSHP (see Section 7.0).
- No red head wooden matches or lighters of any kind will be allowed in the Contaminant Reduction Zone or Exclusion Zone.
- All personnel will have their buddy with them when the buddy system is in effect.

- All personnel will notify the HSO of any unusual occurrences that might effect the overall safe operation of the site.
- Any time a fire extinguisher is used, personnel shall notify the HSO of what took place.
- All injuries and accidents shall be immediately reported to the HSO and the appropriate reports filed.

10.6.3 Traffic Safety Rules

- Any project related vehicles that will not be involved in the site operations will be secured and the motor shut down.
- Only personnel assigned to this job will be allowed to enter the site. Any other people, whether from OSHA, EPA, or vendors supplying equipment, etc., will have to be met prior to entering the site.
- At no time will any equipment be allowed to block any access road. If in the moving of said equipment, a temporary blockage will exist, that equipment will have an operator available to move that equipment.
- All deliveries by outside personnel will be met at the gate and escorted by personnel onto the site.

10.6.4 Equipment Safety Rules

- Proper loading and operation of trucks on-site shall be maintained in accordance with DOT requirements covering such items as grounding, placarding, driver qualifications and the use of wheel locks.
- Operation of heavy construction equipment shall be in accordance with OSHA regulations 29 CFR 1910 and 1926.
- All equipment that is brought on-site will be available for inspection by the HSO.
- The HSO, or designee, will assign protective equipment to all site personnel and this equipment will be made available for inspection at anytime.
- All equipment shall be installed with appropriate equipment guards and engineering controls. These include rollover protective structures.
- Safe distances will be maintained when working around heavy equipment.
- All equipment and tools to be operated in potentially explosive environments must be intrinsically safe and not capable of sparking or be pneumatically or hydraulically driven. Portable electric tools and appliances can be used (where there is no potential for flammable or explosive conditions use three-wire grounded extension cords to

prevent electric shocks.) Ground fault interrupters shall be used as well.

- With hydraulic power tools, fire-resistant fluid that is capable of retaining its operating characteristics at the most extreme temperatures shall be used.
- Cutting or welding operations shall not be carried out without the approval of the HSO and D&B FOM.
- At the start of each work day and on a weekly basis, inspection of brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, and splash protection shall be made by the equipment operators.
- All non-essential people shall be kept out of the work area.
- Loose-fitting clothing or loose long hair around moving machinery shall be prohibited.
- Cabs shall be free of all non-essential items and all loose items shall be secured.
- The rated load capacity of a vehicle shall not be exceeded.
- Dust control measures shall be enforced by the HSO to prevent the movement of dusts from contaminated areas to clean areas.
- Equipment operators shall report to their supervisor(s) any abnormalities such as equipment failure, oozing liquids, unusual odors, etc.
- When an equipment operator must negotiate in tight quarters, a second person shall be used to ensure adequate clearance.
- A signalman shall be used to direct backing as necessary.
- Refueling shall be done in safe areas. Engines should not be fueled while vehicle is running. Ignition sources near a fuel area shall be prohibited.
- All blades and buckets shall be lowered to the ground and parking brakes set before shutting off the vehicles.
- An ongoing maintenance program for all tools and equipment shall be implemented by D&B or the responsible subcontractor equipment supervisor. All tools and moving equipment shall be regularly inspected to ensure that parts are secured and intact with no evidence of cracks or areas of weakness, that the equipment turns smoothly with no evidence of wobble, and that it is operating according to manufacturer's specifications.
- Tools shall be stored in clean, secure areas so that they will not be damaged, lost, or stolen.

10.6.5 Daily Housekeeping

The site and all work zones shall be kept in an orderly fashion

and the site is to be left safe and secure upon completion of each day's work.

10.6.6 Site Personnel Conduct

- All site personnel shall conduct themselves properly and in accordance with generally accepted good work practice.
- At all times, the HSO will monitor all safe operations at the site. Any operation not within the scope of the SHSP will be discussed fully before that operation begins.

11.0 PERSONAL HYGIENE AND DECONTAMINATION

11.1 General

11.1.1 All personnel performing or supervising remedial work within a hazardous work area, or exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids, will observe and adhere to the personal hygiene-related provisions of this section.

11.1.2 Any personnel found to be repeatedly disregarding the personal hygiene-related provisions of the SHSP shall be barred from the site by the HSO.

11.1.3 All on-site personnel shall wear personal protective equipment as required at all times whenever entering the Contaminant Reduction Zone or the Exclusion Zone.

11.1.4 Personal hygiene and decontamination facilities, in accordance with OSHA 29 CFR 1910.120 (N), will be provided on-site and include:

- Storage and disposal containers for used disposable outerwear
- potable water for hand washing.

11.1.5 Hand washing facilities, a lunch area, and toilet facilities will be available off-site at a predesignated location as determined by the D&B project manager prior to initialing exclusion zone work.

11.2 Contamination Prevention

To minimize contact with contaminated substances and lessen the potential for contamination, the following will be adhered to during all phases of site entry and excavation.

- Personnel will make every effort not to walk through any areas of obvious contamination (i.e., liquids, discolored surfaces, smoke/vapor clouds, etc.).
- Personnel will not kneel or site on the ground in the Exclusion Zone and/or the Contaminant Reduction Zone.

11.3 Personal Hygiene Policy

11.3.1 Smoking and chewing tobacco shall be prohibited except in a designated break area within the Support Zone.

11.3.2 Eating and drinking shall be prohibited except in the designated lunch or break area within the Support Zone.

with a damp, clean, disposable wipe. Equipment will then be allowed to air dry.

Step 4 Following decontamination, equipment will be checked and recharged, as necessary, for the next day's operations.

Step 5 Prior to entering the Exclusion Zone, all small equipment will be recovered with new, protective coverings, if necessary.

11.8 Heavy Equipment Decontamination Procedures

The decontamination area for the drill rig will be set up in close proximity to the Exclusion Zone (preferably uphill). A wash/rinse will be done to all surfaces that came in contact with contaminants (e.g., augers). Prior to removing any heavy equipment or vehicles from the Exclusion Zone, they must be thoroughly decontaminated. Specific procedures are as follows:

Step 1 Initially, inspect equipment/vehicles to determine if gross decontamination is required first. Particular attention must be paid to tires, under surfaces, points of contact with the ground, and horizontal surfaces where dusts or aerosols might settle.

Step 2 If visible contamination is present, the equipment/vehicle must be moved to the decontamination pad where gross contamination will be scraped, brushed, or swept off.

Step 3 Following gross decontamination, or if visible contamination is no longer present, wash the equipment/vehicle with high pressure washer as deemed necessary by the HSO. Efforts should be made to minimize water usage to reduce wastewater quantities.

Step 4 Prior to releasing any heavy equipment or vehicles from the Contaminant Reduction Zone, decontamination personnel will contact the HSO for final approval.

12.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

12.1 General: This plan has been prepared in accordance with 29 CFR 1910.120 (l) and will address the following potential emergencies:

- Emergencies outside the Sonia Road Landfill Site.
- Emergencies within the Sonia Road Landfill Site.
- Chemical exposures.
- Site Evacuation.

12.2 Emergency Equipment: Specially marked and readily accessible emergency equipment will be provided as depicted in Table 12-1.

12.3 Special Requirements

12.3.1 The Project Director or FOM will be on-call for any after hour emergencies resulting from adverse weather conditions. Incidents resulting from adverse weather will be reported via the HSO who will in turn contact the Project Director or FOM.

12.3.2 First aid kit locations will be specially marked and have adequate water and other supplies necessary to cleanse and decontaminate burns, wounds, or lesions. First aid stations will also stock buffer solutions for treating acid and caustic burns.

12.3.3 All site personal shall notify each other including the HSO by verbal communications or by using emergency signals as depicted in Table 12-2.

12.4 Emergency/Accident Reporting and Investigation

In the event of an emergency associated with the site work, the HSO will, without delay take: 1) diligent action to remove or otherwise minimize the cause of the emergency, 2) alert the D&B FOM, and 3) institute whatever measures are necessary to prevent any repetition of any conditions or actions leading to, or resulting in, the emergency. Notification of the D&B FOM will occur immediately and initially be verbal with written notification occurring within 24 hours of the incident (i.e.; accident, explosion, serious exposure, etc.). The Incident Notification Form (See Table 12-3) and the OSHA 200 Form (available from the D&B Project Manager) will be used for written notifications and documentation.

TABLE 12-1

LOCATION OF EMERGENCY EQUIPMENT

EQUIPMENT	TYPE	LOCATION(S)
Fire Extinguisher	20A-80B:C Dry Chemical	Each Work Area
First Aid Kit		Each Work Area
Eye Wash	Portable	Each Work Area
Emergency Sprayer	Portable	Each Work Area
Communication	Air Horns	Each Work Area
Map (Figure)	Hospital Route	Each Work Area

Table 12-2

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communications. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communication is not available, the following air-horn and/or hand signals will be used:

EMERGENCY AIR-HORN SIGNALS

HELP!	Three Short Blasts	(...)
EVACUATION!	Three Long Blasts	(- - -)
ALL CLEAR!	Alternating Long and Short Blasts	(-.-.)

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATH!	Hand gripping throat
LEAVE AREA IMMEDIATELY, NO DEBATE!	Grip partner's wrist or place both hands around waist
NEED ASSISTANCE!	Hands on top of head
OKAY! - I'M ALL RIGHT! - I UNDERSTAND!	Thumbs up
NO! - NEGATIVE!	Thumbs down

Table 12-3

INCIDENT NOTIFICATION FORM

TO: Dvirka and Bartilucci Project Director

Date:_____

FROM: HSO
and/or_____
(someone who has direct knowledge of the incident)

1. Contractor's name:_____

2. Organization:_____

3. Telephone Number:_____

4. Location:_____

5. Reporter Name:_____

6. Name of Injured:_____
Birthdate_____

7. Company Employing Injured:_____

8. Date of Incident:_____

9. Company Employing Injured:_____

10. Location of Incident:_____

11. Brief Summary of Incident (provide pertinent details including type of operation at time of incident):

_____

_____

_____

Table 12-3 (continued)

12. Cause, if known:_____

13. Casualties, if any:_____

14. Details of Any Existing Chemical Hazards or Contamination:

_____

_____

15. Estimated Property Damage:_____

16. Affect on Contract Schedule:_____

17. Actions Taken by Contractor:_____

18. What Medical Help was Given:_____

_____

_____

19. Doctor and/or Hospital (if known):_____

_____

20. When did Employee Return to Work:_____

21. Other Damages/Injuries Sustained (public or private):

_____

_____

_____

22. Additional Information:

_____

_____

12.5 Emergency Medical Care

12.5.1 Emergency medical care will be provided to site workers and visitors by Good Samaritan Hospital.

12.5.2 The hospital will be informed by the HSO or D&B FOM of potential medical emergencies that could result from site operations and have been advised on the types of hazardous materials that are on site. In the event of an incident requiring their assistance, specific details of hazardous materials should be provided to Good Samaritan Hospital medical staff, if available.

12.5.3 A list of Emergency Information will be posted at every work site telephone.

12.6 Emergencies Outside the Sonia Road Landfill Site

12.6.1 All work in the Sonia Road Landfill area will stop when advised by any authorized personnel and will remain so until otherwise instructed.

12.6.2 The HSO and FOM will be fully advised of any work that may affect the safety of on-site employees or property.

12.6.3 Actions to be taken in the event of an outside emergency will include:

- Cease all operations immediately; shut all equipment down and secure that equipment.
- All personnel will leave vehicles in work zone in a safe manner making sure any remaining vehicles will not hamper any emergency traffic in the area or block any fire hydrants or foam supply systems.
- All personnel will evacuate to a prearranged master area.
- All personnel will remain in the master area to await further instructions.

12.7 Emergencies Within Sonia Road Landfill Site

12.7.1 As stated, the Sonia Road Landfill Site will be the site that D&B will be operating in. The HSO will monitor all operations and assist any emergency personnel responding to an emergency within this work zone.

12.7.2 It will be the HSO's responsibility to maintain communications with public work personnel.

12.7.3 In the event of an emergency within the work zone at the Sonia Road Landfill Site, the emergency notification procedures shall be followed as described in Section 12.0 and Appendix A of this SHSP.

12.7.4 In all emergency situations, it will be the responsibility of the HSO, to ensure that all site personnel are accounted for.

12.8 Personnel Exposures

The emergency procedures to be used in the event of acute exposure (eyes, skin contact, inhalation) are described in Appendix A.

12.9 Site Evacuation

The site area will be evacuated and fire and police departments will be notified in the event of fire, explosion or their potential. Depending on the cause and magnitude of the conditions requiring evacuation, three stages have been designated as follows:

12.9.1 Upwind withdrawal - withdraw to a safe upwind location if:

- » Air quality concentration contain excessive concentrations of volatile organics, combustible gases, particulates, or oxygen percentage above or below safe levels for the level of protection being worn. The field team will withdraw to a safe upwind location determined by the HSO.
- » A minor accident occurs. The victim will undergo decontamination procedures and be transported to a safe upwind location. Field operations will resume after first aid and/or decontamination procedures have been administered to the affected individual.
- » Protective clothing and/or respirator malfunctions.

12.9.2 Withdrawal from site - evacuate the site if:

- » Explosive levels of combustible gases, toxic gases, or volatile organics are recorded.
- » A major accident or injury occurs.
- » Fire and/or explosion occurs.
- » Shock-sensitive, unstable, or explosive materials are discovered.
- » High levels of radioactive materials are discovered.

12.9.3 Evacuation of nearby facilities -

a continuous release of toxic, flammable, or explosive vapors from the site could affect people off-site. Air quality should be monitored downwind to assess the situation. The D&B FOM, or the on-site designee, is responsible for determining if circumstances exist for any level of off-site contamination warranting concern for people off-site. Always assume worst case conditions until proven otherwise. If conditions are marginal, evacuation should be conducted until acceptable conditions resume. Key personnel identified in the SHSP should be contacted when evacuation of nearby facilities becomes necessary.

A meeting area for evacuation purposes shall be designated by the HSO and the D&B FOM prior to the start of the project. The HSO or designee will conduct head counts after any evacuations.

13.0 REGULATIONS

Regulations will be made available to all personnel involved in the Sonia Road Landfill project by the HSO. The regulations will cover three specific areas:

- Use of personal protective equipment.
- Personal hygiene.
- Provisions for smoking, eating, chewing, and drinking.

These regulations may be added to based on need to disseminate information or policy. All regulations will be coordinated through Dvirka and Bartilucci Consulting Engineers for approval prior to distribution. The three specified regulations are shown as Appendix J, K and L.

APPENDIXES

Appendix A

APPENDIX A

EMERGENCY INFORMATION

HOSPITAL:	Good Samaritan Hospital 100 Montauk Turnpike West Islip, NY Tel.: 516-376-3000	
EMERGENCY SERVICES	TELEPHONE	EMERGENCY NO.
Police		911
Fire		911
Medical Services		911
Town of Islip-Public Safety	(516)224-5300	
Board Certified Physician:	Dr. Ronald Rosen	(718) 470-4435
Dvirka and Bartilucci Office:	(516) 364-9892	
Field Safety Corporation:	(203) 457-2100	

Appendix A (Continued)

EMERGENCIES WITHIN THE Sonia Road Landfill SITE

- Contact the HSO
- Contact the D&B FOM
- Contact Town of Islip-Public Safety at (516)224-5300
- Report the following:
  - Location of emergency in relation to a specific recognizable landmark.
  - Nature of emergency:
    - **FIRE**, if so of what kind and what equipment is involved.
    - **EMERGENCY MEDICAL INCIDENT, ALL INJURIES, ACCIDENTS) OR FIRES.**

      Communication will include:
      - Number of injured people.
      - Nature of injuries.
      - If Project Field Team Members can't handle injuries with its resources, what emergency medical services will be needed.

    - If any outside personnel must enter the Sonia Road Landfill site, any hazards will be communicated and those people will be supervised by the HSO.
    - In the event that any site personnel wearing protective equipment in the Exclusion Zone becomes injured, the HSO or designated individual will do whatever decontamination is necessary to remove that equipment.
    - Any emergency treatment information dealing with the injury will accompany the injured party so that those treating that person will have any and all information.

    - **REQUEST FOR POLICE**. If any person entering the Sonia Road Landfill Site who does not belong there becomes a problem, the Police will be notified. If that person either endangers the safe operation of Project Field Team members or himself, the HSO will suspend all work until that person can be removed.

  - If site personnel will be evacuating the Sonia Road Landfill Site due to emergency.

Appendix A (Continued)
PERSONNEL EXPOSURES WITHIN THE Sonia Road Landfill SITE

- Contact the HSO
- Contact the D&B FOM
- Provide Treatment as follows:

  - Eye Exposure - treat by immediate flushing with distilled water (portable eyewash). Transport for examination and treatment to Good Samaritan Hospital (516-376-3000).
  - Skin Exposure - remove contaminated clothing and treat by washing with soap and water.
  - Inhalation - if a person inhales a large amount of organic vapor, the person will be removed from the work area to fresh air and artificial respiration will be administered if breathing has ceased. The affected person will be transported to Good Samaritan Hospital if overexposure to lungs has occurred.
  - Personal Injuries - in case of severe injury, the victim will receive emergency first aid at the site, as appropriate, and will be transported by ambulance or emergency vehicle to Good Samaritan Hospital. An accident form must be completed for any accident or occupational exposure and forwarded to the D&B FOM and HSO.

Appendix A (Continued)

EVACUATING THE Sonia Road Landfill SITE

- Contact the HSO
- Contact the D&B FOM
- Contact the Town of Islip-Public Safety at (516)224-5300
- Follow the directions below:

  - Upwind withdrawal - withdraw to a safe upwind location if:

    - » Air quality concentration contain excessive concentrations of volatile organics, combustible gases, particulates, or oxygen percentage above or below safe levels for the level of protection being worn. The field team will withdraw to a safe upwind location determined by the HSO.
    - » A minor accident occurs. The victim will undergo decontamination procedures and be transported to a safe upwind location. Field operations will resume after first aid and/or decontamination procedures have been administered to the affected individual.
    - » Protective clothing and/or respirator malfunctions.

  - Withdrawal from site - evacuate the site if:

    - » Explosive levels of combustible gases, toxic gases, or volatile organics are recorded.
    - » A major accident or injury occurs.
    - » Fire and/or explosion occurs.
    - » Shock-sensitive, unstable, or explosive materials are discovered.
    - » High levels of radioactive materials are discovered.

  - Evacuation of nearby facilities - a continuous release of toxic, flammable, or explosive vapors from the site could affect people off-site. Air quality should be monitored downwind to assess the situation. The D&B FOM, or the on-site designee, is responsible for determining if circumstances exist for any level of off-site contamination warranting concern for people off-site. Always assume worst case conditions until proven otherwise. If conditions are marginal, evacuation should be conducted until acceptable conditions resume. Key personnel identified in the SHSP should be contacted when evacuation of nearby facilities becomes necessary.

A meeting area for evacuation purposes shall be designated by the HSO and the D&B FOM prior to the start of the project. The HSO or designee will conduct head counts after any evacuations.

Appendix B

APPENDIX B

COLD STRESS

The purpose of this section is to make all workers on-site aware of the problems associated with cold weather operations. As with heat related emergencies, cold weather injuries are progressive. That means that if the worker is aware of the problems beforehand he may prevent further damage and remain working.

Cold related injuries may be divided into two types:

LOCAL COOLING affects the particular part of the body coming in direct contact with the cold air. This is commonly known as FROSTBITE.

GENERAL COOLING affects the entire body and is known as HYPOTHERMIA. Hypothermia is a true medical emergency and should be recognized as such and treated immediately by trained medical personnel.

As stated, cold related injuries are progressive. The body loses heat either by CONDUCTION or direct transfer of body heat into the cold environment. An example would be an unprotected head allowing the surface area of the head to come in direct contact with the colder air. The other means by which the body loses heat is by CONVECTION. This occurs when colder air is allowed to pass over the body surface. When that air is also moist or the garments work become wet, a WATER CHILL or more commonly recognized WIND CHILL occurs. An example of wind chill would be a 20 mph wind during a 10 degree day would produce the same effect as -25 degree temperature. Both of these conditions may be easily prevented by proper work attire and safe work practices. Hardhat liners prevent the wind from blowing under the brim but will also affect your hearing ability. Lose layers of work clothes rather than bulky garments will allow the wearer to adapt to changing conditions. Use of rubber overboots will prevent leather workboots from getting wet and are excellent for stationary work to stop cold penetration.

SIGNS TO LOOK FOR:

FROSTNIP, the first stage of frostbite occurs when a body part comes in direct contact to a cold object or cold air. This condition is not serious and can be remedied by worming of the region. The real problem is that a numbing effect can occur and keep the worker from realizing that he is going into the next stage SUPERFICIAL FROSTBITE.

The skin and under layers become effected. If not treated this can become a FREEZING condition in which the deeper structures of the body become effected.

CONDITION	SKIN SURFACE	TISSUE UNDER SKIN	SKIN COLOR
frostnip	soft	soft	red-white
frostbite	hard	soft	white/waxy
freezing	hard	hard	white/gray

HYPOTHERMIA occurs when the body is unable to maintain its proper temperature of 98.6 degrees. It is important for the worker to realize that this can occur in temperatures of 50 degrees and below. Submersion of a body part in cold water will also cause hypothermia very quickly. Some early signs are:

1. Shivering
2. Numbness in extremities
3. Drowsiness
4. Slow breathing and pulse rates
5. Failing eyesight
6. Loss of coordination, inability to do easy tasks
7. Freezing of body parts

Proper treatment begins by activation of emergency medical service procedure. Hypothermia required prompt qualified medical treatment. Initial site action would revolve around getting the affected worker out of the weather and begin the warming process. The most important thing to realize is that Hypothermia is a MEDICAL EMERGENCY.

Workers exposed to cool temperatures for extended period of time can experience lesions in the form of red swollen areas that seem hot and itchy. These chronic lingering lesions are known as CHILBLAINS. Although not an emergency, the Chilblains indicate that the worker in not adequately protecting the affected area.

A common problem in wet work areas is TRENCHFOOT. The worker whose feet remain unprotected by leather footwear in water close to freezing will have swollen limbs that appear waxy and mottled in color. The affected limb will appear cold to the touch. Basic treatment revolves around getting the worker to a warm place and slowly removing the wet footwear. The obvious way to prevent Trenchfoot is to wear rubber protective footwear.

Some suggestions to prevent cold weather operation problems:

1. Plan ahead as to the proper work clothes to be worn.
2. Avoid early overheating which dampens clothes and hastens the release of body heat by evaporation.
3. Use of windbreaks in the work zone.
4. Elimination of standing water or avoid prolonged immersion in that water.
5. Provision of heated rest area i.e. trailer or vehicle.
6. Avoid overheating of the rest area. Extreme temperature differentials between the work area and the rest area will lead to chilling upon return to work.

7. Proper diet and eating habits.
8. Avoid or cut down smoking which constricts the blood vessels.

REMEMBER, YOU ARE THE BEST PROVIDER OF INFORMATION ABOUT HOW YOU FEEL. THE BEST WAY TO PREVENT INJURIES FROM COLD WEATHER OPERATIONS IS TO RECOGNIZE THE EARLY SIGNS AND PREVENT SERIOUS INJURY.

APENDIX C

HEAT STRESS

1.0 WORKING CONDITIONS AS RELATED TO HEAT STRESS

Operations at the Site are scheduled for start up in early fall. Since all operations will be done in some level of personal protection, consideration of the effects of heat stress is in order.

1.1 Personal Protective Clothing

All of the protective ensemble does not lend itself to the release of body heat generated during work. With this in mind, the following will be taken into consideration during the work schedule so as to minimize the heat stress to all personnel:

A. All personnel will be advised to wear lightweight undergarments with short sleeves, under the chemical protective coverall.

B. Personnel will be advised that extra clothing be on-site for use as the workday progresses due to the clothing becoming wet from perspiration.

C. Dressing-out will be done in a designated trailer and be scheduled so as not to extend time in the protective ensembles.

D. The dress-out area will have a table with fresh water and/or other water replenishing liquids along with disposable cups. All personnel will be expected to drink liquids before each work cycle. The HSO will supervise the dressing and water intake.

E. As the job progresses and more information becomes available as to the materials that the workers are coming in contact with, consideration as to modifications to the protective ensemble will be examined. Such things as allowing personnel to keep the protective garment's hood down allowing for the release of heat. All decisions regarding the protective ensemble will be the HSO's decision based on available information.

F. After completion of each work cycle, personnel will pass through personnel decontamination and remove their protective ensembles in the designated area. All personnel will then be medically monitored, if deemed necessary by the HSO. Liquid replenishment will be mandatory after each work cycle.

G. Eating facilities will allow for meal periods to be taken in the designated lunch area. On days of extreme temperatures, the use of air conditioning in the

decontamination trailer will be limited so as not to have personnel exposed to temperature extremes.

1.2 Causes of Heat Stress

Wearing the expected levels of protection on-site can put personnel at risk of developing heat stress. This section will discuss heat stress and what steps will be taken to monitor personnel for the signs of it.

The body's chemical activities take place in a limited temperature range. Heat is generated by these processes. Any heat not needed to sustain the activities must be lost from the body to maintain a balance. HYPERTHERMIA is an abnormally high body temperature. The three main avenues for the release of body heat are:

A. Respiration is our breathing pattern. Care should be taken that the body is not fooled into believing it is cool based on skin temperature.

B. Radiation is how heat is released from the skin. Blood will pool on the surface of the skin as body temperatures increase. The protective ensemble specified for this site will not allow for this type of heat release.

C. Evaporative Heat Loss normally allows for a body to cool itself by the evaporation of perspiration. Because the protective ensemble stops any contact with moving air the sweat coming off of the body will not evaporate.

If any of these release mechanisms is out of balance, the following conditions can occur and may be considered emergencies needing care:

A. **HEAT RASH** is a common occurrence in areas where body parts rub causing friction. The level of protection will heighten its effects. Proper treatment would be personal washing of the affected areas and administering powder to help healing.

B. **HEAT CRAMPS** occur when people are exposed to heat for extended periods of time. Due to the wearing of the required protective ensemble, this will be expected. The person will sweat heavily and drink large quantities of water. The more the person sweats, the more electrolytes are lost. If enough body salts are lost, the individual will begin to experience body cramps and pain in the extremities.

   Proper treatment includes slow replenishment of body fluids augmented by a proper salt solution along with cooling the individual down, taking care not to expose the person to extreme cooling measures. The worker will not be allowed to return to work until the HSO has monitored and approved re-entry.

C. **HEAT EXHAUSTION** occurs as the blood pools at the skin surface in an attempt to cool the body. Sweating is profuse, skin is moist and cool, and the

patient will experience dizziness, nausea, or fainting. This condition is an indicator of overwork in the environmental conditions. Treatment includes all for heat cramps with an extended rest period before re-entry. Depending on the worker's physical condition, rest periods may be from 30-60 minutes. After experiencing heat exhaustion, the worker should be closely monitored for symptoms reoccurring.

D. **HEAT STROKE** can occur if heat exhaustion is not cared for. This occurs when the body loses its ability to regulate its temperature. Sweating stops and, if not treated, can lead to death. Signs and symptoms include dry red skin with no perspiration along with nausea, dizziness and confusion. A strong, rapid pulse should be carefully monitored as this condition can lead to coma. Proper treatment begins by understanding that this is a true medical emergency and requires activating the emergency medical system as covered in other sections. When notifying the Emergency Medical Response organization, emphasis should be placed on the words HEAT STROKE and the need for rapid transportation to the medical facility. (See Appendix A of the HASP). Emergency medical treatment in the field includes immediate cooling of the body with total body immersion preferable. Water temperature should be cool enough to absorb the high body heat but not cold. Ice packs can be applied to the person's head area and under the arms. Due to the personnel needed to treat the patient while awaiting emergency medical care, all work will stop and all attention will be devoted to the person in stress. The First Aid Technician will evaluate all personnel after the patient is transported to determine if they also are showing signs of heat stroke.

To facilitate treatment of all of the above, the trailer, with its air conditioning, fresh water supply and shower, will be used if necessary. In all cases requiring treatment, emergency decontamination procedures based on the individual's degree of contamination will be done before entry into the trailer. Remember: *You* are your own best indicator of signs of heat stress.

1.3 Heat Stress Monitoring

The use of PPE may place site workers at risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Because heat stress is probably one of the most common illnesses at hazardous waste sites, regular monitoring, and other preventative measures, will be taken to protect site workers. The HSO may modify heat stress monitoring. Specific measures to be taken include (See Table I - Apparent Temperature Dangers Posed by Heat Stress):

- Using a thermometer to measure ambient temperatures.
- Periodically measure heart rate, oral temperature, blood pressure, and body water loss, whenever workers are in impervious clothing in temperatures above 70 F.
- Instituting work cycles and rest periods accordingly.

TABLE I

Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers [a]

ADJUSTED TEMPERATURE [b]	NORMAL WORK ENSEMBLE [c]	IMPERMEABLE ENSEMBLE
90 F (32.2) or above	After each 45 minutes of work	After each 15 minutes of work
87.5 -90 F (30.8 -32.2 C)	After each 60 minutes of work	After each 30 minutes of work
82.5 -87.5 (28.1 -30.8 C)	After each 90 minutes of work	After each 60 minutes of work
77.5 -82.5 F (25.3 -28.1 C)	After each 120 minutes of work	After each 90 minutes of work
72.5 -77.5 F (22.5 -25.3 C)	After each 150 minutes of work	After each 120 minutes of work

Source: NIOSH/OSHA/USCG/EPA guidance manual for hazardous waste site activities (NIOSH No. 85-115)

a For work levels of 250 kilocalories/hour

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

c A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Appendix D

Appendix E

APPENDIX E

SAFETY MEETING

DATE HELD _____ Time _____

1. The safety meeting was held this date for the following personnel:

   (CONTRACTOR) _____

   (SUB-CONTRACTOR) _____

   (HSO) _____

   (OTHER) _____

2. Subjects discussed (note, delete, or add):

   Accident trends/new hazards -
   Individual protective equipment -
   Back injury, safe lifting techniques -
   Fire prevention -
   Sanitation, first aid, waste disposal -
   Tripping hazards -
   Staging -
   Equipment inspection & maintenance (zero defects) -
   Hoisting equipment -
   Ropes, hooks, chains, and slings -
   Trucks, tractors, front-end loaders, scrapers, graders, gradall -
   Electrical grounding, temporary wiring, GFCI -
   Lockouts for safe clearance procedures: electrical, pressure moving parts -
   Steep slopes -
   Toxic materials: hazards, MSDS, respiratory, ventilation -
   Other -

3. Forwarded _____

   Prepared by _____

   Signature _____

APPENDIX E

SAFETY INSPECTION LIST

Project Name/Number:_____ Date:_____

Name:_____ Title:_____

This safety inspection list is to be completed by the HSO turned into the D&B Project Manager. Any deficiencies found are to be corrected immediately.

1. Is the OSHA Safety and Health protection poster on the job? _____
2. Are emergency telephone numbers conspicuously posted? _____
3. Are first-aid kits and supplies on the job? _____
4. Are there first-aid trained personnel on the job? _____
5. Are warning signs and posters adequate? _____
6. Is there an adequate supply of personal protective gear available?
   a. Hard Hats _____
   b. Hearing Protection _____
   c. Eye and Face Protection _____
   d. Respiratory Protection _____
7. Are all personnel wearing the appropriate personal protective gear? _____
8. Is there an adequate slope or support provided for all trenches and excavations? _____
9. Is temporary electrical service grounded and is all other electrical equipment grounded? _____
10. Is the housekeeping adequate-are all aisles, passageways, and stairways clear of obstructions? _____
11. Are there any fire hazards on the job that could be eliminated?_____

APPENDIX E (continued)

12. Have heavy equipment been thoroughly inspected and is there a record of the inspections on file? _____

13. Is the job site fire protection adequate?

    a. Fire Extinguishers - have they been checked? _____

    b. Available Water Hoses? _____

    c. Barrels of Water with Buckets? _____

14. Is there adequate clearance between equipment or machinery and energized power lines? _____

15. Is the record of injuries and illnesses properly maintained and on file? _____

16. Are there job site safety meetings being held at least once a week?

    _____

17. Are all new employees indoctrinated with respect to their individual safety responsibilities? _____

18. Do my personal safety practices set a good example for all employees? _____

19. Misc.:_____

_____

_____

_____

_____ _____

Signature Date

Appendix F

APPENDIX F
SITE WORKER TRAINING AND MEDICAL EXAMINATION RECORD

SITE: Sonia Road Landfill

Name	Date Training Completed		Date of Last Physical Examination
	Initial	Refresher*	

*Refresher training on-site is documented on the following page.

APPENDIX F (continued)

REFRESHER TRAINING DOCUMENTATION

EMPLOYEE/VISITOR NAME **REPRESENTING**

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

TOTAL TIME ALLOCATED TO REFRESHER TRAINING:_____

DATE OF TRAINING: _____

LOCATION: _____

TOPICS COVERED (describe clearly):

_____

_____

_____

MATERIALS USED (if any):

_____

_____

_____ _____ _____

Trainer Signature Trainer Name Printed Date

APPENDIX G
CARE AND CLEANING OF RESPIRATORS

General Requirements

Any organization using respirators on a routine basis should have a program for their care and cleaning. The purpose of a program is to assure that all respirators are maintained at their original effectiveness. If they are modified in any way, their Protection Factors may be voided. Usually one person in an organization is trained to inspect, clean, repair, and store respirators.

The program should be based on the number and types of respirators, working conditions, and hazards involved. In general, the program should include:

- Inspection (including a leak check)
- Cleaning and Disinfection
- Repair
- Storage

Inspection

Inspect respirators after each use. Inspect a respirator that is kept ready for emergency use monthly to assure it will perform satisfactorily.

On air-purifying respirators, thoroughly check all connections for gaskets and "O" rings and for proper tightness. Check the condition of the facepiece and all its parts, connecting air tubes, and headbands. Inspect rubber or elastomer parts for pliability and signs of deterioration.

Maintain a record for each respirator inspection, including date, inspector, and any unusual conditions for findings.

Cleaning and Disinfection

Collect respirators at a central location. Brief employees required to wear respirators on the respirator program and assure them that they will always receive a clean and sanitized respirator. Such assurances will boost morale. Clean and disinfect respirators as follows:

- Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats.
- Remove elastic headbands.
- Remove exhalation cover.
- Remove speaking diaphragm.
- Remove inhalation valves.
- Wash facepiece and breathing tube in cleaner/sanitizer powder mixed with warm water, preferably at 120% to 140% F.
  Wash components separately from the facemask, as necessary. Remove heavy soil from surfaces with a hand brush.
- Remove all parts from the wash water and rinse twice in clean, warm water.

- Air dry parts in a designated clean area.
- Wipe facepieces, valves, and seats with a damp lint-free cloth to remove any remaining soap or other foreign material.

NOTE: Most respirator manufacturers market their own cleaners/sanitizers as dry mixtures of a bactericidal agent and a mild detergent. One-ounce packets for individual use and bulk packages for quantity use are usually available.

Repairs

Only a trained person with proper tools and replacement parts should work on respirators. No one should ever attempt to replace components or to make adjustments or repairs beyond the manufacturers' recommendations. It may be necessary to send high pressure side components of SCBA's to an authorized facility for repairs.

Make repairs as follows:

- Disassemble and hand clean the pressure-demand and exhalation valve assembly (SCBA's only). Exercise care to avoid damage to the rubber diaphragm.
- Replace all faulty or questionable parts or assemblies. Use parts only specifically designed for the particular respirator.
- Reassemble the entire respirator and visually inspect the completed assembly.
- Insert new filters, cartridges, or canisters, as required. Make sure that gaskets or seals are in place and tightly sealed.

Storage

Follow manufacturers' storage instructions, which are always furnished with new respirators or affixed to the lid of the carrying case. In addition, these general instructions may be helpful:

- After respirators have been inspected, cleaned, and repaired, store them so to protect against dust, excessive moisture, damaging chemicals, extreme temperatures, and direct sunlight.
- Do not store respirators in clothes lockers, bench drawers, or tool boxes. Place them in wall compartments at work stations or in a work area designated for emergency equipment. Store them in the original carton or carrying case.
- Draw clean respirators from storage for each use. Each unit can be sealed in a plastic bag, placed in a separate box, and tagged for immediate use.

APPENDIX H

MEDICAL DATA SHEET

This Medical Data Sheet will be completed by all on-site personnel and will be kept in the Support Zone during site operations.

Project:_____

Name:_____

Address:_____

Home Telephone: Area Code ( )_____

Date of Birth:_____ Height:_____
Weight:_____

In case of Emergency, contact:_____
(name and relationship)

Address:_____

Telephone: Area Code ( )_____

Do you wear contact lenses? ( ) Yes ( ) No

Allergies:_____

List medication taken
regularly:_____

Particular
sensitivities:_____

Previous/recent illnesses or exposures to hazardous
chemicals:_____

_____

Name of Personal
Physician:_____

Telephone: Area Code ( )_____

APPENDIX I
AIR MONITORING RESULTS REPORT

Date: _____

Duration of Monitoring:

_____

Work Location and Task:

_____

_____

Instrument Reading _____ (Time)	Instrument Reading _____ (Time)	Instrument Reading _____ (Time)
_____	_____	_____
_____	_____	_____
_____	_____	_____

(Note: If instruments have recorders, just attach tape to report. Also note any action levels when exceeded.)

Instrument Calibration:_____

Perimeter Samples Collected:_____

_____

Personnel Samples Collected:_____

_____

Perimeter and Personnel Sample Results From Previous Day (attach data once received):

_____

Comments:_____

_____

_____ _____

Name Title (Site Safety Officer)

Signature _____

APPENDIX J
Regulation 1 - Use of Personal Protective Equipment

WHO This regulation applies to all site workers, supervisors, and visitors, *without exception.*

WHEN Prior to entering the Contaminant Reduction Zone (CRZ) or Exclusion Zone (EZ) provisions of this regulation will be followed.

WHAT This regulation outlines the initial forms of PPE required to be worn while working in the CRZ and EZ. Particular types or forms of PPE may be altered based on the authority of the HSO. Specific guidelines are provided in Section 7.0 of this SHSP. Disposable PPE will not be worn more than one workshift of workday. In some instances disposable PPE may have to be replaced more than once during a workday. The HSO shall determine the frequency of replacing disposable PPE. Reusable PPE will be properly decontaminated, cleaned, sterilized (if appropriate), and stored. Doubts regarding what to wear shall be directed to the HSO for resolution.

WHY The levels of protection specified in the SSHP were chosen to protect individuals from potentially harmful exposures to chemicals or physical hazards. No changes to PPE specifications are authorized without the permission of the HSO.

APPENDIX K

Regulation 2 - Personal Hygiene

WHO This regulation applies to all site workers, supervisors, and visitors, but is intended primarily for site workers.

WHEN Before beginning work, during scheduled breaks, and at the end of a workday.

WHAT This regulation summarizes the policy on personal hygiene that applies to all site personnel. Personal hygiene includes those activities such as washing hands, showering, shaving, etc., that are conducive to keeping one's body clean and mind refreshed. For the individual's sake, and his/her coworkers, each worker will be responsible for maintaining a high level of personal hygiene. This is especially critical prior to breaks where food, beverages, or smoking will occur. If proper personal hygiene is not followed, potential ingestion, absorption, or inhalation of toxic materials may occur. Particular attention must be paid to close shaving whenever respirators are worn. Facial hair and long hair will interfere with respirator fit and will allow excessive contaminant penetration.

WHY To avoid accidental ingestion, absorption, or inhalation of hazardous materials. To maintain an elevated state of awareness, thus reducing potential mental errors and accidents.

APPENDIX L

Regulation 3 - Provisions for Smoking, Eating, Chewing, and Drinking

WHO This regulation applies to all site workers, supervisors, and visitors, *without exception.*

WHEN At all times personnel are on-site. This regulation will specifically apply during breaks and rest periods.

WHAT Site personnel are forbidden to smoke, eat, chew, or drink in the Exclusion Zone or Contaminant Reduction Zone. Only those areas specified as break areas or common areas in the Support Zone may be used for smoking, eating, chewing, or drinking. The rest/break facility and office trailers in the Support Zone may be used. Individuals found to be repeatedly disregarding these provisions will be released.

The only exception to this regulation involves access to electrolytic fluids in the Contaminant Reduction Zone when the HSS has determined heat stress warrants regular replenishing of lost body fluids.

WHY To protect personnel from accidental exposures to hazardous materials, smoking, eating, chewing, and drinking is prohibited everywhere except designated break areas. To avoid potential fires and explosions, smoking is prohibited everywhere except designated break areas and office trailers.

HEALTH AND SAFETY PROCEDURES
FOR HAZARDOUS WASTE SITES

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS

HEALTH AND SAFETY PROCEDURES FOR HAZARDOUS WASTE SITES

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1.0 INTRODUCTION

1.1 Purpose

This plan establishes Dvirka and Bartilucci's (D&B) occupational health and safety requirements, responsibilities, and procedures to protect workers during investigation and mitigation of sites contaminated with hazardous materials. It is the policy of D&B to assure safe working conditions for all hazardous waste site projects. Planning of a worker health and safety program for hazardous waste sites is necessary to prevent potential hazards to workers' health and safety at these sites and to assure that work can proceed with minimum risk to workers.

1.2 Requirements

The requirements for worker health and safety are based on the following:

- The Standard Operating Safety Guides. US Environmental Protection Agency (EPA) Office of Emergency and Remedial Response.
- The Occupational Health and Safety Administration (OSHA) Regulations, 29 CFR Parts 1910 and 1926.
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. NIOSH, OSHA, USCG, and EPA. October 1985.

1.3 Applicability

The protection of D&B workers' health and safety, and the environment are major concerns during the investigation and mitigation of hazardous waste sites. Personnel must be protected from the potential of a high risk of incurring illness or injury while investigating or mitigating a hazardous waste site. Since they cannot anticipate every safety hazard associated with a hazardous waste site project, they must take extraordinary precautions to prevent illness or injury to themselves, other workers, and the public.

with a hazardous waste site project, they must take extraordinary precautions to prevent illness or injury to themselves, other workers, and the public.

Work conditions can be expected to vary from site to site and from task to task. Conditions may also be expected to change as work progresses. Based on these considerations, a site specific plan (Section 2.5 below) will be prepared for each hazardous waste site project.

Since D&B personnel may not attain the ideal objective of complete elimination of risk, they must reduce the risk to the lowest feasible level. No set of rules can be applied uniformly to every situation. The procedures presented in this manual represent a safety and health protection approach to a typical hazardous waste site. The application of this plan to specific hazardous waste sites must be based on the judgment of the Project Manager and/or Site Health and Safety Officer who is responsible for the health and safety of the site personnel.

1.4 Waste Site Hazards

Hazardous materials are known to be present on or under the surface of hazardous waste sites. The nature of these materials will require the use of protective clothing and equipment in order to minimize worker exposure to known or suspected site hazards. Potential waste site hazards may include:

- Chemical Exposure
- Explosion Hazards
- Ionizing Radiation
- Safety Hazards
- Heat and Cold Stress
- Fire Hazards
- Oxygen Deficiency
- Biological Hazards
- Electrical Hazards
- Noise

2.0 PROGRAM ORGANIZATION

2.1 Health and Safety Program

Anticipating hazards and preparing measures to prevent potential hazards from occurring are essential to planning an effective program. Five aspects of program planning are necessary:

- Developing an organizational structure
- Establishing a comprehensive work plan Coordinating with the community response organizations
- Developing a site health and safety plan
- Ensuring implementation of the site health and safety plan

2.2 Organizational Structure

Hazardous waste site projects require the interaction of government agencies, contractors, and technical specialists, both on-site and off-site. A Site Plan should identify each task, personnel and organizational requirements of the project. The team will likely be composed of agency officials, the prime site contractor and subcontractors. A Project Director will be responsible for the overall administration of the contract and implementation of D&B's safety policy. Any decisions or changes in the health and safety program that may affect D&B health and safety policy should be reviewed and approved by the Principal-in-Charge or Project Director.

2.2.1 Project Team

The Project Team should consist of the following personnel:

- Off-site

  - Government Agency Liaison
  - (EPA, OSHA and/or other lead agency)
  - D&B Project Director
  - D&B Project Manager
  - D&B Occupational Health and Safety Representative
  - Industrial Hygienists
  - Site Quality Assurance and Control Officer
  - Medical Support

- On-site

  - Site Health and Safety Officer
  - Field Operations Manager
  - Site Workers
  - Other optional support personnel as needed

- On-site and off-site specialists for special tasks as needed:

  - Environmental scientists
  - Hazardous chemical experts
  - Health physicists
  - Toxicologist
  - Chemists
  - Public safety expert
  - Meteorologist
  - Communication personnel

2.2.2 Project Responsibilities

2.2.2.1 - Project Director

The Project Director reports to the Principal-in-Charge or senior D&B officer and is responsible for overall program management for hazardous waste site projects. Specific responsibilities for health and safety include:

- Designating a qualified site Project Manager and Site Health and Safety Officer and assuring that these persons fulfill all responsibilities necessary for safe completion of the project

- Ensuring the development and implementation of the site specific health and safety program for hazardous waste site investigations

- Promptly reviewing and approving site specific health and safety plans submitted by the Project Manager

- Providing the necessary resources for the project

- Ensuring that all employees who work at the hazardous waste site receive a baseline health assessment

2.2.2.2 - Project Manager

The Project Manager has primary responsibility for:

- Preparing a Site Health and Safety Plan, Work Plan and organizing the Project Team prior to the investigation

- Submitting the Site Health and Safety Plan, prior to the investigation, to the Project Director for review and approval

- Assisting the Site Health and Safety Officer in selecting the level of personnel protection needed for use at hazardous waste site investigations

- Ensuring that the program and support staff are instructed, trained and certified in the work practices required to ensure safety

- Enforcing the required safety work practices

- Enforcing site control

- Assisting the Site Health and Safety Officer in investigating accidents

- Correcting work errors and conditions that may result in injury or exposure to hazardous materials

- Assuring the health, welfare and safety of all staff members at the hazardous waste site

- Serving as a liaison with public officials

- Assuming total control over site activity

- Preparing the final report on the project

2.2.2.3 - Site Health and Safety Officer

The Site Health and Safety Officer will be responsible for:

- Advising and assisting the Project Director and Project Manager in developing, organizing, directing, and evaluating the health and safety program for the hazardous waste site project
- Reviewing and commenting on the site specific health and safety plan
- Determining the level of protection appropriate for the hazardous waste site
- Implementing of the site health and safety plan, including communicating site requirements to all personnel, field supervision, and consultation with the Project Manager
- Coordinating accident reporting, record keeping, and medical surveillance of site workers
- Logging reportable injuries within six working days, and maintaining records of such injuries for five years
- Recommending stop-work action if worker health and safety is threatened
- Reporting immediately to the Project Director, Project Manager and Industrial Hygienist any accident that is fatal or results in hospitalization of employees
- Supervising the protective equipment program and industrial hygiene activities
- Conducting audits and inspections for compliance with this manual and agency regulations
- Coordinating site and personnel emergencies

2.2.2.4 - Industrial Hygienist

Industrial Hygienists will be responsible for support of implementation of the health and safety plan as described in Section 5 of this manual. The principal IH will report directly to the Site Health and Safety Officer.

2.2.2.5 - Field Operations Manager

The Field Operations Manager reports directly to the Project Manager and will be the first line supervisor responsible for ensuring that D&B work crews comply with all site work and safety requirements. Specifically the Field Operations Manager will be responsible for:

- Supervising site workers
- Coordinating activities with the Site Health and Safety Officer
- Implementing appropriate safety protection measures Enforcing site control
- Enforcing safety procedures

2.2.2.6 - Site Workers

Site Workers carry out specific tasks necessary for completion of the project and are responsible for:

- Complying with the provisions of the Health and Safety Program established in this manual
- Reporting to their team leaders or the Site Health and Safety Officer any unsafe condition and all facts pertaining to incidents which resulted in employee injury or exposure to hazardous materials
- Cooperating in medical surveillance activities
- Safely completing all required on-site tasks

2.3 Site Work Plan

A site work plan will be prepared that will describe anticipated site investigation or cleanup activities. The activities to be planned will include:

- Review of existing information
- Defining work objectives and tasks
- Establishing a sampling plan
- Establishing a task schedule
- Preparing a site inventory
- Determining containment, removal and disposal procedures
- Determining personnel requirements
- Determining training requirements

2.4 Community Coordination

Certain site activities and emergency procedures may require the cooperation of state and local officials and services. They must be planned and coordinated to ensure worker and public safety. Adequate information must be relayed to appropriate persons to prevent misinformation and misunderstanding.

2.5 Site Specific Plan

The Project Manager must prepare and obtain approval of a Site Specific Health and Safety Plan before conducting a hazardous waste site project. The Project Manager and Site Health and Safety Officer must maintain the plan on file, make it readily available and, provide a copy to each D&B employee participating in the hazardous waste site investigation.

A Site Specific Health and Safety Plan is required to be developed in accordance with:

1. OSHA Safety and Health Standards 29 CFR 1910 (General Industry), US Department of Labor.

2. OSHA Safety and Health Standards 29 CFR 1926/1910 (Construction Industry), US Department of Labor.

3. Standard Operation Safety Guidelines, USEPA, Environmental Response Branch, Hazardous Response Support Division, Office of Emergency and Remedial Response.

Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (NIOSH, 1985) prepared by The National Institute for Occupational Safety and Health (NIOSH), US Coast Guard (USCG), and Environmental Protection Agency (EPA) is recommended as a guide. An example of a site-specific plan outline is as follows:

SITE SPECIFIC HEALTH AND SAFETY PLAN

1.0 GENERAL

1.1 Site Information

2.0 PURPOSE AND SCOPE

2.1 Purpose and Scope of the Field Investigation
2.2 Purpose and Scope of this SHSP

3.0 SUMMARY OF EXISTING INFORMATION

3.1 Site Location, Ownership and Access
3.2 Site Description
3.3 Site History

4.0 PERSONNEL ORGANIZATION AND RESPONSIBILITIES

4.1 Designations of Personnel
4.2 General Responsibilities of Health and Safety Personnel

5.0 HAZARD ASSESSMENT AND RISK ANALYSIS

5.1 Health Hazard Analysis
5.2 Activity Safety and Health Hazard Analysis

When appropriate, the site specific plan must be signed by designated representatives of the site contractor and submitted to the contractor prior to commencing site work activities.

The Site Health and Safety Officer must keep the Health and Safety Plan, and other appropriate written information describing the potential health and physical injury hazards of a hazardous waste site investigation, in a file that is readily available to D&B employees.

3.0 MEDICAL PROGRAM

3.1 Preassignment Screening

All D&B personnel on site shall have successfully completed a preplacement or periodic/update physical examination. This examination has been designed to assure maximum worker health and to comply with appropriate regulatory requirements. The purpose is to establish a baseline health record and to seek conditions which would predispose the employee to illness due to exposure to hazardous materials or due to the physical demands of using personal protective equipment.

The Project Director must ensure that all employees who work at hazardous waste sites receive a baseline health assessment. The health assessment must be at least equivalent to the EPA Medical Monitoring Guidelines. The preassignment assessment includes a work history, a medical history, a physical examination, customary laboratory tests and agent specific tests when appropriate for specific exposures. Medical screening of workers at waste sites has been reviewed by Melius and Halpern, 1981.

Medical surveillance of the workers at a hazardous waste site must be performed by a physician with experience in occupational medicine. Records of each person's medical exam shall be maintained and evidence of each examination shall be provided to the contractor. The physician must certify that each individual is medically qualified to wear respiratory protective devices and to perform stated work assignments.

The following medical protocol is recommended, but may be modified by the physician where appropriate for specific work assignments and for potential chemical exposures.

- Medical History
- General Physical
- Pulmonary Function
- Kidney Function
- Urine Heavy Metals
- Chest X-ray

- Electrocardiogram
- Blood Profile
- Complete Blood Count
- Hemoglobin
- Urinalysis
- Serum Cholinesterase
- Liver Function
- Serum Lead
- Visual Acuity
- Hearing
- Otoscoptic Exam
- Tetanus
- Stress Test
- Neurological Test

3.2 Periodic Medical Examinations

Periodic medical examinations of hazardous waste site workers will be conducted, depending on site conditions and site activities. The periodicity and content of these assessments must be determined by the Project Director after consultation with an occupational physician, the Site Health and Safety Officer, and the Project Manager. Depending upon the site specific conditions, they should include:

- Biannual examinations or annual examinations depending upon degree and/or frequency of exposure to contaminated material
- Examinations following an acute exposure to any hazardous material

These assessments include an updating of the employee's work and medical histories, including occurrences of any accidental exposures previously unreported. The periodic health assessment must include a physical examination and may also include biochemical or other measurements of body fluids, and an evaluation of pertinent functional systems of the body.

The following information must be included in the employee's medical record:

- Names of hazardous materials to which the employee may have been exposed
- Information on the probability, frequency, and extent of exposures
- Any available environmental measurements relating to hazardous materials

The Site Health and Safety Officer is responsible for requesting and helping to schedule examinations and must furnish employees, prior to each examination, with exposure and environmental monitoring data as specified above for inclusion in their medical records.

3.3 Termination Examination

At the end of employment at a hazardous site, all personnel shall have a medical examination as described above for the preassignment examination. The scope of this examination may vary depending on the time since the employee's last physical, exposure to hazards, and/or signs or symptoms of exposure.

3.4 Emergency Treatment

Provisions for emergency treatment should be planned in advance. Provisions will be made for having a physician on call on a 24-hour basis.

Should site personnel suffer an injury or illness, the following resources will be utilized, as appropriate. These resources should be planned for and potential services arranged prior to site work.

- First Aid and/or Cardiopulmonary Resuscitation Team
- Fire Department Rescue Squad
- Ambulance Service
- Sheriff's Office
- Hospital Emergency Room
- Designated On-call Physician

If an injury/illness is the result of chemical exposure, a supervisor shall promptly initiate the steps necessary to identify the chemical(s). Such information shall be made available to the treating physician and the Site Health and Safety Officer.

Any injury or illness will require the completion of "Accident/Injury Report."

Any injury/illness not limited to first aid will require that the Field Team Leader immediately notify the Site Health and Safety Officer. This will allow the coordination of internal resources to assist the treating physician in rendering appropriate care.

3.5 Nonemergency Treatment

Arrangements should be made in advance for possible non-emergency medical care for site workers. Off-site medical care should be used for evaluation of job-related illness and injury, and other illness and injury that may put workers at risk on the job.

3.6 Medical Records

Medical records must be maintained by the occupational physician for the duration of the employee's employment. Upon termination of the employee's employment, including retirement or death, the medical records must be maintained for an extended period of time in a manner that will ensure ready access as needed by the medical monitoring program of the EPA. The extended period of time must be at least 30 years after the individual's last work with hazardous materials as required by OSHA 29 CFR 1910. Records should be forwarded to the Medical Monitoring Program Manager, Office of Occupational Health and Safety (OOHS), if custody of the records cannot be maintained locally. Medical records shall be made available to the worker.

4.0 TRAINING

Training in health and safety procedures must be provided to all personnel prior to working at a hazardous waste site. On-site managers and supervisors should receive the same training as site workers. Training may be conducted by qualified staff or professional trainers qualified to perform the necessary training. Site workers should be under direct supervision of fully trained and experienced supervisors.

All site personnel, as a minimum and where appropriate to their assigned tasks, will have successfully completed training in the following generic topics:

- Chemical hazards and protection measures
- Hazardous chemical handling
- Decontamination procedures
- Emergency procedures and rescue
- Monitoring of equipment
- Personal protective clothing and accessories
- Respirators
- Workers' rights and responsibilities
- Physical, chemical and toxic properties
- Chemical exposure and exposure limits

4.1 Initial Training

The Project Director must ensure that all employees receive training on specific site safety procedures before conducting hazardous waste site activities. Initial training should include at a minimum the following:

- Health and Safety Plan
- Site Hazards
- Safe Work Practices
- First Aid
- Emergency Procedures
- Decontamination Procedures
- Worker Protection Procedures
- Vehicle Use Procedures
- Safe Sampling Procedures
- Handling, Storage and Transport

4.2 Visitor Training

All visitors to the site must receive a briefing on site safety. Visitors should not be allowed in the contaminated exclusion zone unless they have been fully trained and medically approved.

4.3 Follow Up Training

Follow up training will be required for those workers needing refresher courses, new or modified skills and knowledge peculiar to a new site specific condition or operation, or changes in procedures, personal protective clothing or equipment.

4.4 Training Records

The Site Health and Safety Officer will obtain approval from the Project Director for the initial and follow up courses and will issue a certificate to employees upon completion of each course and field experience. In addition, the Site Health and Safety Officer must maintain records of training and forward individual records to employees' personnel files.

5.0 INDUSTRIAL HYGIENE SUPPORT

5.1 Industrial Hygiene Team

The services of at least one certified Industrial Hygienist (IH) with a minimum of three years experience in the chemical industry or hazardous waste management should be provided. The IH will report directly to the Site Health and Safety Officer and will be assisted, where needed, by one or more industrial hygienists, IH technicians and/or health and safety specialists.

5.2 Worker Protection

The HSO is directly responsible for the supervision of the worker protection program which includes:

- Hazard surveillance
- Monitoring
- Hazard assessment
- Use of protective equipment
- Training
- Supervising worker safety

The HSO will monitor the proper use of protective equipment and clothing. They will assist and train workers in the use and fitting of these items. They will inform workers on the job of any inadequate or improper use of protective devices and unsafe work practices. Any workers failing to comply will be reported to the Site Health and Safety Officer and Field Team Leader. The Project Manager will enforce safe practices and discipline workers who fail to comply.

All persons entering regulated areas will be equipped with appropriate personal protective devices.

5.3 Hazard Surveillance

At the beginning of each shift, and as often as necessary to ensure safety, a qualified person shall conduct an area survey to locate work place hazards and determine appropriate control measures.

5.4 Monitoring

Industrial hygiene monitoring must be conducted before work begins. Monitoring will be conducted at appropriate locations and for personnel in work areas. For immediate evaluation of potential health hazards, direct reading instruments such as portable combustible gas and oxygen meters, photoionization meters, gas chromatographs, radiation survey meters, and colorimetric detector tubes will be used. The Project Manager must be aware of the limitations of these portable direct reading instruments when characterizing the unknown chemicals at unknown concentrations at hazardous waste sites.

In addition, time-weighted exposure monitoring should be done in situations where survey meters indicate a potential exposure hazard. Appropriate personal and/or area sampling pumps and dosimeters should be used in these situations.

All monitoring data are to be entered into permanent log books. When complete, all logs are to be forwarded to the Project Manager.

5.5 Hazard Assessment

When the presence or concentration of specific chemicals or classes of chemicals indicates a potential hazard, the specific hazards will be determined. OSHA standards and other guidelines such as National Fire Protection Association (NFPA), American Conference of Governmental Industrial Hygienists (ACGIH), National Institutes of Occupational Safety and Health (NIOSH) and Nuclear Regulatory Commission (NRC) will be used to determine safe

levels of- airborne chemicals. The degree of hazards assessed above these exposure levels will determine the degree of protective clothing and equipment required. Hazard assessments will include explosion and fire potential, oxygen deficiency, radiation, toxic gases and vapors. Contact hazards such as corrosivity, dermal absorption and toxicity will also be considered. Levels that are immediately dangerous to life and health will require the greatest degree of protection.

6.0 SITE CHARACTERIZATION AND EVALUATION

6.1 Preliminary Characterization

The Site Health and Safety Plan will be based upon a thorough evaluation of past site activities, existing data and a site perimeter reconnaissance. A perimeter inspection and aerial photo analysis, followed by an on-site reconnaissance, may reveal safety hazards requiring special attention. A site description will be prepared to include site location, site environment, site history, and current conditions. A review of the site's history from interviews and records should be made. The evaluation may indicate possible chemical hazards such as the presence of incompatible chemicals, toxic gases, explosives, etc. This information will help to specify needed safety precautions.

6.2 On-site Survey

An on-site survey in conjunction with a review of site records will be done to inventory as completely as possible all hazardous materials on the site and the extent of site contamination. The survey should include a detailed map of the site, locating all known or potential hazards. The site must be monitored for any highly hazardous conditions that would be immediately dangerous to life and health. All potential physical and chemical hazards should be identified and characterized.

6.3 Monitoring

Ongoing monitoring of chemical hazards will be conducted using stationary sampling equipment as well as personnel monitoring devices. Direct reading instruments are to be used to periodically survey potential hazards.

Requirements for protection of employees from radiation exposure include maximum permissible exposure, precautionary procedures, personal monitoring, notification and reports of incidents. All hazardous waste sites must be checked for radioactivity during first entry onto the

site. Normal background radioactivity is approximately 0.01 to 0.02 mR/hr. Detecting levels of activity significantly greater than normal background is cause for a very careful survey of the entire site. If levels approaching 2 mR/hr are encountered, the advice of the radiation health physicist must be sought before continuing operations on the site.

Sampling procedures will be performed in a manner to minimize he risk of personnel exposure to hazardous materials during sampling, packaging, shipping and analysis, and to minimize the risk of exposure of others to spill or residual waste materials. Disposable sampling equipment should be used wherever possible.

Samples of runoff, ambient air, soil, or groundwater from a contaminated site or possible affected areas, may be moved directly into laboratories and handled with normal safety precautions, unless the Project Manager determines that special handling is appropriate. However, samples of liquids or solid materials removed from containers of obviously contaminated spill areas must be assumed to be hazardous materials and handled in compliance with OOHS Safety Manual CHAPTER 8 "Laboratory Use of Toxic Substances". All samples taken will be logged and tracked from the time of collection to analysis, using standard chain-of-custody procedures.

6.4 Hazard Assessment

Based upon the off-site and on-site survey, a detailed assessment of chemical and physical hazard will be prepared. This assessment will include identification of all potential chemical and physical hazards. Assessment guidelines include ACGIH TLVs; US DHHS 1984; NFPA 1984; NIOSH 1994 Pocket Guide; US DOT 49 CFR 172; US DOT 1984.

- Potential exposures
- Routes of exposure
- Potential carcinogens
- Highly toxic substances

- Corrosive hazards
- Fire and explosion hazards
- Potential public hazards
- Key hazardous operations
- High hazard areas
- Biological hazards
- Ionizing radiation
- Conditions immediately dangerous to life and health
- Exposure limits and standards

6.5 Work Zones

The site will be divided into three well-delineated work zones which are related to potential hazards to the workers. The boundaries between these zones may change as work progresses. The zones include:

Exclusion Zone - This zone includes the actual areas of contamination. This zone has the highest inhalation exposure potential and/or presents the highest probability of skin contact with hazardous chemicals.

Contamination Reduction Zone - This zone includes the areas immediately surrounding the Exclusion Zone. This zone has the next highest inhalation hazard but does not have a high probability of skin contact with hazardous chemicals.

Support Zone - This clean zone covers all areas outside of the contamination reduction zone. Adverse exposure to chemicals is unlikely.

6.6 Hazardous Chemicals

Information on the chemical, physical and toxicological properties of each compound known or expected to be on-site must be recorded in the site-specific health and safety plan.

Material Safety Data Sheets from manufacturers are one source of data if the chemicals are known. This data should be supplemented from other sources such as NIOSH's Registry of Toxic Effects of Chemical Substances (RTECS), Sax's Dangerous Properties of Industrial Materials, Merck Index, NFPA Fire Protection Guide on Hazardous Materials, or other references. Online computer databases such as the Chemical Information System's Oil and Hazardous Materials (OHM), the National Library of Medicine's Hazardous Substances Data Bank, or Occupational Health Service's Hazardline may also be useful.

6.7 Information Documentation

Documentation of information pertinent to site conditions, field activities, and sample analysis will be required. This documentation will include:

- Log books
- Graphs
- Labels
- Analytical records
- Field records
- Photographs
- Chain-of-custody forms
- Letters and memos

All documents should be controlled and accounted for at the end of the project. One person should be assigned the task of maintaining and controlling documents. Standard procedures should be prepared to identify, authenticate and track each document.

7.0 MONITORING

Comprehensive monitoring of environmental contaminants on-site will be performed. Monitoring will include air, personal soil water and the perimeter where contaminants may affect the public. These data will be used to select protective equipment, delineate hazardous areas, assess potential health effects, and identify medical monitoring needs. Monitoring will consider conditions immediately dangerous to life and health (IDLH). Instrumentation and sampling procedures should follow those provided by ACGIH, NIOSH and US EPA.

7.1 Instruments

Direct reading monitoring instruments will be used for real-time monitoring of air contaminants and hazard conditions. Only trained and qualified personnel will use these instruments and interpret data from them. All instruments will be calibrated routinely and chemical response curves developed where none exist. Instrument operators must be familiar with the detection limits and interference of other chemicals on recorded values. All data records and calibrations will be logged and maintained.

7.2 Air Monitoring

Air monitoring and sampling if required, will be used to monitor site conditions. Air monitoring/sampling locations, frequency, and duration will vary with site conditions, but must be provided in the plan. A variety of monitoring/sampling media should be used to monitor the major classes of airborne contaminants. All samples will be uniquely identified, controlled through chain-of-custody and analyzed using appropriate analytical methods specified in the NIOSH Manual of Analytical Methods.

Air will be monitored at specified locations along the perimeter of the site to measure any potential off-site contamination. Supplementary meteorological data will be collected to interpret sample results.

Periodic air sampling may be conducted when site conditions change that would alter the initial hazard assessment. Sampling may be implemented when:

- Different areas of the site are entered
- Different contaminants are handled
- A new and different operation is conducted
- Spills or leaks occur

7.3 Personal Monitoring

Workers at risk will be monitored. Personal samples will be collected in the breathing zone external to protective equipment. Personal sampling pumps will be set at a calibrated air flow and protected from contamination. The sampling plan should include use of various sampling media and sampling strategies to monitor as many chemical agent exposures as possible. Personal monitoring procedures and protocols will follow OSHA's Industrial Hygiene Technical Manual.

7.4 Heat and Cold Stress Monitoring

Heat and cold conditions must be considered in planning and conducting site operations. Temperature effects can include physical discomfort, reduced efficiency, personal injury, increased accident probability, and heat or cold stress. Heat stress is of particular concern while wearing impermeable protective garments, since these garments prevent evaporative body cooling.

All employees shall be informed of the importance of adequate rest and proper diet in the prevention of heat stress. All appropriate procedures regarding heat stress shall be met. Additionally, one or more of the following control measures can be used to help control heat stress:

- Provide adequate liquids to replace lost body fluids. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst is not an accurate indicator of adequate salt and fluid replacement.

- Replacement fluids can be a 0.1% salt water solution, commercial mixes such as Gatorade or Quik Kick or, a combination of these with fresh water. In addition, on days when the potential for heat stress is apparent, advise employees to salt food more heavily: This practice is preferred over the use of salt tablets.

- Establish work regimens that will provide adequate rest periods for cooling down. This may require additional shifts of workers. All breaks are to be taken in a cool rest area. Employees shall remove impermeable protective garments during rest periods.

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments when needed.

- The effectiveness of employees' rest-regimen should be confirmed by monitoring heart rate. Use the Brouha guideline.

- (Count pulse for last 30 seconds of the first three minutes after rest begins. If the first recovery pulse is maintained at 110 beats/min. or lower and deceleration between the first and third minute is at least 10 beats/min., there is no increase in strain as the work day progresses.)

8.0 PERSONAL PROTECTIVE EQUIPMENT

8.1 Personal Protective Equipment Program

D&B requires that all employees use appropriate protective equipment to protect against potential hazards at waste sites. A site specific personal protective equipment (PPE) program will be prepared in accordance with site conditions. The following PPE requirements will be promoted and enforced.

8.2 Respiratory Protection

A respirator use program will be provided for all hazardous waste site personnel who enter areas where a potential for inhalation exposure to a hazardous material is present. This program will meet the requirements of the OSHA General Industry Standards for respiratory protection as detailed in 29 CFR 1910.134 and ANSI Z88.6. The respirators will be certified in accordance with the requirements of the National Institute for Occupational Health and Safety under the provisions of 30 CFR Part 11. The selection and use of respirators must be approved by the Site Health and Safety Officer or designated certified Industrial Hygienist and follow the NIOSH Guide to Industrial Respiratory Protection. Respiratory protection will include the following:

- Properly cleaned, maintained, NIOSH approved respirators will be used.
- Selection of respirators will be reviewed with the IH and approved by the Site Health and Safety Officer.
- As a minimum, air-purifying cartridges will he replaced at the end of each shift.
- Employees wearing air-purifying respirators will be permitted to change filter elements whenever an increase in breathing resistance or breakthrough is detected.
- Only employees who have had qualitative respirator fit tests prior to issue and, semiannual quantitative fit tests thereafter, will be allowed to work in atmospheres where respirators are required.

- If an employee experiences difficulty in breathing during the fitting test or during use, he or she will be reexamined by a physician to determine whether the employee can wear a respirator while performing the required duty.

- Employees who wear respirators may leave work areas to wash their face and respirator facepiece as needed to prevent potential skin irritation associated with respirator use.

- Facial hair that might interfere with achieving a good facepiece seal is prohibited.

The following procedures must be followed at hazardous waste sites.

1. Self Contained Breathing Apparatus (SCBA) must be worn on-site when:

   Containers of unknown or known materials are being opened that may be a potential inhalation hazard.

   When in enclosed spaces where hazardous materials are present, such as abandoned waste chemical storage buildings or manholes which have received spilled chemicals.

   When the Site Health and Safety Officer or designee judges that the concentration of hazardous materials in the air is greater than 10 times the OSHA permissible Exposure Level.

   When concentration of oxygen in a work space falls below 19.5%

2. Cartridge respirators, which are easier to use but provide less protection than SCBA's, can be worn on-site only when:

   Hazardous materials in the air are not greater than 10-times the Permissible Exposure Level, and have good warning properties.

   The Site Health and Safety Officer or designee judges that respirators are needed as a precaution against generation of low levels of toxic substances in air due to sampling, handling, decontaminating, or other operations.

   Extended periods of use on-site would not cause the capacity of the cartridge to be exceeded.

   Measurements have verified that at least 19.5 percent oxygen is present.

Emergency escape respirators are carried by cartridge respirator users. Escape respirator must be donned immediately upon experiencing any warning property such as difficulty breathing, dizziness, or other distress, strong taste, or smell. User must then leave that location.

Cartridge or emergency escape respirators must be carried on-site when the Site Health and Safety Officer judges that, although the risk is very low, hazardous materials may become present in the air during operations. The respirators must be used immediately upon experiencing any of the warning properties described above and the user must then leave that location.

8.3 Protective Clothing and Accessories

Protective clothing must be worn by all personnel while on a suspected or confirmed hazardous waste site. In the absence of clear indications that work can proceed safely without protective clothing, standard required items include:

- Chemical resistant pants
- Jacket
- Apron
- Boots and Gloves
- Hard hat or head cover

Eye protection devices must be worn to provide appropriate eye protection on any hazardous waste site and should meet ANSI Z87.1, "Practice for Occupational and Educational Eye and Face Protection".

Accessories may include:

- Flashlight
- Knife
- Personal dosimeter
- Two-way radio

- Safety belts or lines
- Ear protection
- Personal locator beacon

Selection of specific chemical protective clothing will depend on the type of chemicals likely to be encountered. Careful selection by the Site Health and Safety Officer of vendor supplies is required. No single material or style of protective clothing is adequate for all situations. Guidelines for selecting chemical protective clothing is provided by Schwope, et.al. A fully encapsulating chemical protective suit in hazard areas may be required.

As work site conditions change, personal protective equipment specifications will be modified according to the site health and safety plan. Such items may include:

- Cooling garments
- Radiation protection suits
- Proximity garments

The Project Manager must also consider the potential hazards of wearing protective clothing since it is cumbersome, hastens the onset of fatigue, increases heat stress, and increases the time that personnel must spend in the high risk area.

8.4 Protection Levels

Although the Site Health and Safety Officer must determine the level of protection which is appropriate for each hazardous waste site, four specific protection levels (A, R, C and 0) may be used as bench marks to select from. The selected level must be based on available site information. Specific criteria, given in the OSH Guidance Manual for Hazardous Waste Site Activities, will be followed for each protection level:

- Protection level A requires the highest degree of protection including a fully encapsulating, chemical resistant suit with full facepiece, SCBA or supplied air respirator.

- Protection level B requires full chemical resistant clothing with a full facepiece SCBA or supplied air respirator and full chemical resistant clothing.

- Protection level C requires full facepiece, air purifying canister-equipped respirator, air purifying cartridge-equipped respirator as appropriate, and full chemical resistant clothing, or light chemical suit as appropriate.

- Protection level D requires standard work clothes such as coveralls, boots, safety glasses and hard hat. Other protective clothing such as gloves, face shield or chemical splash goggles should be added depending on the work assignment at this level. This protection level applies to situations in which there is minimal risk to hazardous chemicals.

In addition, protection and first aid should be provided for common health hazards associated with outdoor work such as poison ivy, insect bites and stings, and ticks. Since ticks are known disease vectors, affected persons should report tick bites to a physician. Poison ivy contact should be treated immediately.

Minimum personal protection equipment for work site may be described by work zone. All work zones must be clearly marked.

8.5 Use of Personal Protective Equipment

Personal protective equipment (PPE) will offer adequate protection only if used properly. Use of PPE will require:

- Training
- Fit testing
- Appropriate resistance to chemical permeation
- Conformance to personal use factors (e.g. no facial hair, eyeglasses if using a full face respirator, gum or tobacco

- Procedures for donning and removal of PPE
- Monitoring use and effectiveness of PPE
- Appropriate decontamination procedures
- Maintenance
- Inspection
- Proper storage

8.6 Physiological Factors

Employees must compensate for the increased heat stress caused by wearing protective clothing in hot weather in order to prevent the onset of heat induced illnesses. Employees must maintain an appropriate work-rest regimen and water and salt balances. (See Section 7.5).

9.0 WORK PRACTICES

The work practices specified in this section will be used for all hazardous waste site projects. In general, the Project Manager must ensure that, even where specific OSHA standards do not exist, employees undertaking hazardous waste site activities are kept free from recognized hazards that cause or are likely to cause death or serious physical harm.

- A Safety meeting shall be conducted at the beginning of each shift and whenever new personnel arrive at the job.
- Proper management of compressed gases and compressed air equipment will be required.
- Proper management of flammable and combustible liquids will be required.
- All air cylinders placed on heavy equipment for use by the operator shall be well secured in a bracket which is bolted or welded to the unit.
- Prompt remedial action shall be taken whenever an inadvertent release of a hazardous material occurs.
- Appropriate action to provide secure footing shall be taken at all locations where personnel will be working.

9.1 Personal Hygiene

- All personnel must wash any affected area immediately after obvious contact with a hazardous substance.
- Eating, drinking, smoking, and application of cosmetics shall be restricted to the designated rest area(s) in the clean zone.
- All employees shall be required to wash their face and hands with soap and water before eating, drinking, smoking, or applying cosmetics.
- Eye washers should be used immediately for any chemical contact with the eyes.

9.2 Buddy System

Personnel on site will use the "buddy" system. Buddies or pairs of workers should prearrange hand signals for communication in case of a lack of radios or radio breakdown. Communication or visual contact shall be maintained between crew members at all times.

All personnel shall avoid contact with potentially contaminated substances. Walking through puddles or mud, kneeling on the ground, or leaning against drums should be avoided.

Field personnel must observe each other for signs of toxic exposure. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin discoloration
- Changes in coordination
- Changes in demeanor or behavior
- Excessive salivation and pupillary response
- Changes in speech pattern

Field personnel shall inform each other of nonvisual effects of toxic exposure such as:

- Headaches
- Dizziness
- Nausea
- Blurred vision
- Cramps
- Irritation of eyes, skin, or respiratory tracts

9.3 Decontamination

Provisions, as described below in Section 11, must be made for decontamination and safe packaging of protective clothing; burial or safe packaging of disposable gear; handling of samples and preparation of samples for shipment; transfer of equipment, gear, and samples from the contaminated area to the clean area. These provisions will depend on several variables but must be worked out in advance.

9.4 Forbidden Practices

The following practices are expressly forbidden during operations on hazardous waste sites:

- Smoking, eating, drinking, chewing gum or tobacco
- Applying cosmetics; storing utensils, food or food containers while on site
- Igniting flammable liquids within, on, or through improvised heating devices (barrels, etc.) or space heaters
- Approaching or entering into areas or spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment available to enable safe entry
- Conducting on-site operations without off-site backup personnel

10.0 DECONTAMINATION

10.1 Decontamination Plan

Procedures for leaving the contaminated area will be planned before entry.

10.2 Facilities and Equipment

Equipment and supplies for decontamination will be available on site. The equipment and supplies must allow employees to wash exposed areas of their bodies as well as equipment or other items which have been in the exclusion zone. The wash water and other contaminated materials must be collected for disposal.

10.3 Decontamination Procedures

The following decontamination procedures will be used where applicable:

- Rinse or flush with water
- Chemical leaching and extraction
- Evaporation
- Air jets
- Scrubbing and scraping
- Steam jets
- Chemical detoxification
- Organic solvent cleaning
- Acid or base cleaning
- Disinfection/sterilization
- Detergents/soaps

10.4 Contamination Prevention

Contaminated protective equipment shall not be removed from the regulated area until it has been cleaned or properly packaged and labeled or disposed.

Employees shall not be permitted to exit the regulated area until contaminated clothing and equipment have been removed, and employees have washed their hands and face with soap and water.

Removal of materials from protective clothing or equipment by blowing, shaking, or any other means which may disperse materials into the air is prohibited.

Where possible, disposable materials, protective gear, and sampling materials should be used.

Minimize contact with hazardous materials.

Protect tools and equipment from contact with chemicals.

10.5 Personnel Decontamination

Under normal conditions, decontamination of personnel will require careful removal of personal protective equipment and protective clothing. All personnel entering or leaving the contamination reduction zone will be required to pass through these areas to put on or remove their protective equipment. Disposable over-boot cover will be provided for personnel exiting through the unit.

Any contamination of skin or eyes will require flushing the area of contact with water followed by prompt medical attention.

10.6 Equipment Decontamination

Whenever possible, equipment should be decontaminated prior to leaving the site. Equipment which cannot be decontaminated at the scene must be double bagged and transported to another area for eventual decontamination. Where possible, verify completeness of decontamination with portable vapor analyzers, swipe tests, or other appropriate tests.

10.7 Disposal

All equipment or materials that are not decontaminated will be properly disposed of. All items for disposal will be placed in containers and labeled. Spent solutions and contaminated wash water will also be properly disposed of.

11.0 CONTAINER HANDLING

11.1 General Problems

Handling of drums and containers can be the most hazardous operation in sampling and waste site cleanup. Specific procedures for containers found at a site will be detailed in the Site Health and Safety Plan. The following procedures will be followed for all hazardous waste sites. Container hazards will be identified and planned for.

11.2 Handling Drums

All drums will be inspected and characterized. Legible and understandable precautionary labels will be prominently affixed to containers of raw materials, intermediates, products, by-products, mixtures, scrap, waste, debris, and contaminated clothing.

Appropriate handling equipment will be used. Contents of leaking deteriorating or damaged drums will be transferred to a safe container. Appropriate personal protective equipment and safety procedures will be used when opening containers.

11.3 Sampling and Characterization

Where practical, sampling equipment used on a hazardous waste site should be disposable. Sampling instruments and other nondisposable equipment should be kept clean with disposable protective covers. Dippers, scoops, and similar devices for solids samples should be placed in plastic bags for disposal or decontamination. Liquid samples from drums or tanks should he withdrawn in inert tubing, such as glass, and tubing should then be broken and abandoned within the barrel or tank. If incineration or recycling of barrel contents is contemplated, the tubing may be disposed of in other suitable containers, or buried on the sites.

11.4 Packing and Shipping

Hazardous materials must be packed to withstand shocks, pressure changes, and any other conditions which might cause the contents to leak during ordinary handling and transportation. Shipments of hazardous materials must be in accordance with the US Department of Transportation (DOT) regulations.

12.0 EMERGENCY PROCEDURES

12.1 Emergency Plan

The Site Health and Safety Officer must develop procedures to protect personnel in case of emergencies at the hazardous waste site. The Emergency Plan must include:

- Emergency Personnel
- First Aid
- Personal Protective Equipment
- Standard Procedures
- Evacuation Procedures
- Emergency Services

12.2 Emergency Personnel

Trained rescue personnel will be available off-site. Telephone numbers for all emergency personnel will be available in the site-specific Health and Safety Plan.

12.3 Standard Procedures

A sufficient number of fire extinguishers, with a minimum rating of 1O8:C, must be available in the work area, if there are potential fire hazards on-site.

Fire Protection- Requirements for employee fire brigades and fire fighting equipment must be followed. If explosivity readings greater than 20 percent LEL (Lower Explosive Limit) are detected, very careful survey of the area must be made. Readings approaching or exceeding SO percent LEL are cause for immediately withdrawing personnel and notifying the emergency, fire, and explosion units. The Project Manager must be consulted before continuing operations.

Site HSO and site workers shall carry compressed air horns. In the event of fire, spill, inadvertent vapor release, or other hazardous incident, three short blasts shall signal all personnel to evacuate the site.

Personal protective equipment on emergency standby shall include:

- Full chemical resistant suits (2 suits)
- Neoprene boots with hard sole liners (4 pair)
- Self-contained breathing apparatus (2 units)
- Backup bottles for SCBA (2 bottles)

12.4 Evacuation Procedures

Alternate routes for evacuation will be planned for individual sites. Evacuation should be in an upwind direction and Clearly marked. A wind sock and anemometer will be set up on site to monitor wind direction and speed along with air monitoring devices. Escape routes will be explained to all site workers.

12.5 Emergency Services and Notifications

The emergency procedures should include notifying emergency and other affected personnel and posting their locations and emergency telephone numbers. A map and directions for emergency services should be provided. Emergency services to post include:

- Nearest Emergency Medical Facility
- Ambulance Service
- Fire Department
- Police Department
- Poison Control Center

At sites where medical facilities are not located nearby, the Site Health and Safety Officer must ensure that employees are adequately trained to administer first aid and at such sites, suitable facilities for quick drenching or flushing must be provided.

13.0 SITE CONTROL

13.1 Site Preparation

Preparation of the site for cleanup operations will be done. It is recognized that site preparation may be as hazardous as site cleanup, and require the same level of safety measures. Site preparation will include, where applicable, the following:

- Roadway construction
- Traffic planning
- Elimination or reduction of safety hazards
- Construction of operation pads for mobile facilities
- Construction of loading docks
- Construction of processing areas, staging areas
- Installation of decontamination pads
- Installation of lighting
- Installation of power and electrical equipment

13.2 Site Security

Maintaining a secure site promotes worker safety and limits access to visitors and the public who might otherwise become exposed to hazardous materials. A flagman with roadwork vest, signs, cones, and high level warning signs shall be provided when it is necessary to control normal vehicular traffic due to vehicles entering or leaving the site. Government regulatory personnel, media, and other visitors will not be permitted to enter the site without appropriate authorization and approval of the Project Manager. The following site security procedures will be maintained:

- Erecting a fence around the site and posting it
- Controlling access to regulated areas

- Permitting only authorized personnel with appropriate identification to enter the regulated areas
- Accompanying all site visitors by trained personnel
- Securing all equipment and facilities
- Requiring all persons entering regulated areas to be subject to the health and safety requirements set forth by this manual or the site specific health and safety plan
- Providing site surveillance
- Enlisting public enforcement agencies, where applicable

13.3 Communication

Two sets of communication systems will be established for the site, an on-site system and an off-site system. On-site communication will include:

- Warning systems
- Visual signals
- Public address system
- Telephones
- Citizen Band radios

Off-site systems may include:

- Telephones
- Hotlines
- Telefax
- Electronic mail

13.4 Warnings and Postings

The areas which contain, or are suspected of containing hazardous materials, will be clearly delineated and posted. The Project Manager may establish more than one exclusion zone for areas of different levels of potential personnel hazard. Only persons authorized by the Project Manager may enter a exclusion zone.

14.0 STANDARD OPERATION AND SAFETY GUIDELINES

14.1 Standard Operating Procedures

The Site Specific Health and Safety Plan for D&B personnel will include standard operating procedures for safe use of equipment and materials. Requirements for the proper handling and storage of materials will be followed. Specific requirements will be followed concerning powered industrial trucks, cranes, derricks, and slings. Safe management of hand and portable powered tools and other handheld equipment is required.

Well drilling work must comply with OSHA rules.

Before any drilling work, the existence and location of underground pipes, electrical conductors etc., must be determined.

Site specific health and safety plan for D&B personnel for drilling and sampling operations must be prepared as part of the Health and Safety Plan.

14.2 EPA Guidelines

Field Standard Operating Procedures (USEPA) and Manual on Personal Protection and Safety, prepared by the EPA Office of Emergency and Remedial Response will be followed.

14.3 OSHA Standards

OSHA Standards (29 CFR 1910 and 29 CFR 1926) will be followed where applicable. These include but are not limited to:

- Materials Handling and Storage
- Explosivity
- Industrial Trucks
- Cranes

- Electrical Safety
- Flammable and Combustible Liquids
- Compressed Gases
- Welding, Cutting, Brazing
- Radioactivity
- Toxic and Hazardous Substances
- Machinery
- Machine Guarding
- Drilling Equipment
- Slings
- Handheld and Portable Equipment

Compliance with maximum permissible exposure levels (PEL), to air contaminants will be required. More detailed requirements concerning employee exposure to specific OSHA regulated contaminants must also be met (20 CFR 1910.1001 through 1910.1045).

14.4 Voluntary Standards and Guidelines

Where regulatory standards do not exist, voluntary standards, guidelines, or generally accepted safety procedures related to health and safety will be followed. These may include:

- ACGIH TLVs
- NIOSH Criteria Documents
- National Safety Council
- NFPA Fire Protection Guide
- ANSI Standards
- ASTM Standards
- USDOT Emergency Guide
- Standard References

14.5 State and Local Regulations

In certain situations state and local regulations need to be considered where federal regulations do not preempt state and local laws. These situations most likely affect emergency planning and use of state and local Officials and services. Any corporation of state and local requirements in hazardous waste site activities will be planned and coordinated in advance.

15.0 DOCUMENTATION

All activities and operations for a hazardous waste site project will be documented. All documentation requirements outlined in this manual will be monitored by the Field Operations Manager or Site HSO. They include:

- Log Books
- Memos and Letters
- Medical Records
- Chain-of-Custody
- Analytical Records
- Accident Reports
- Guides, Procedures and Plans
- Progress Reports
- Final Reports
- Record Keeping
- Audits and Inspections

The Project Director must ensure that periodic program reviews, including on-site inspections and audits of the Health and Safety Program of hazardous waste site projects are conducted by persons with appropriate background and training, and that any deficiencies are corrected as soon possible (or immediately if the deficiency is an imminent hazard). The Project Director must forward a copy of the program review and abatement actions to the Site Health and Safety Officer and Project Manager for review. The Site Health and Safety Officer may conduct independent audits to ensure that all health and safety procedures are being followed.

The Site Health and Safety Officer must coordinate the reporting of any incident involving injury or exposure to a hazardous material (inoculation, ingestion, dermal contact, inhalation). The Site Health and Safety Officer must forward a copy of the accident report to the employee s medical record, and log all accidents according to the responsibilities described in this manual.

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