# INTERIM REMEDIAL MEASURE
# WORK PLAN
may 1995

RON HILL CLEANERS
71 FOREST AVENUE
GLEN COVE, NEW YORK
NASSAU COUNTY
SITE #1-30-071

MAY 1995

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## INTRODUCTION

Tyree Brothers Environmental Services, Inc. (TBES) has been contracted by Bedford Affiliates to perform the required environmental work specified in the Order on Consent for the subject property. This report supplies the Interim Remedial Measures (IRM) Work Plan requested in Section II of the Order on Consent.

The subject property consists of a one-story, 3,600 square foot concrete block building with no basement on a 33,668 square foot plot. The property is located at the northeast intersection of Forest Avenue and Bryce Avenue in Glen Cove, New York. The areas to the south, east, and west of the building are asphalt paved. There is a grass area located to the north of the building. No fencing is currently located on the property. The building is boarded with plywood to discourage vandalism (see Figure 1 - Site Map in the Appendix).

The existing building was erected in 1963 to be utilized as a drive in cleaning establishment. The site was vacated in 1993 and is currently vacant. Therefore, the property has been utilized as a dry cleaning establishment for approximately thirty (30) years. Prior to the erection of the building in 1963, the property was vacant land.

The following information regarding hazardous wastes at the subject site was taken from the files of the Nassau County Department of Health (NCDH) in Mineola, New York, on January 28, 1993. Please note that the dates refer to the report date unless otherwise noted.

## Hazardous Waste Generation Information

| Type | Quantity | Physical State | Location | Method | Date |
|---|---|---|---|---|---|
| Reclamation Water | Unknown | Liquid | Unknown | Distillation | 1-8-80 |
| Dry Powder | Unknown | Solid | Machines ducted to sniffer | Sniffer | 1-8-80 |
| Separator Water | Unknown | Liquid | Separator | Unknown | 9-23-85 |
| Filter Powder | Unknown | Solid | Unknown | Sniffer | 9-23-85 |
| Separator Water | 120 gal/month | Liquid | Separator | Conden. & Dist. | 9-27-88 |
| Filter Powder | Unknown | Solid | Unknown | Sniffer | 9-27-88 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | Unknown |
| Filter Powder | Unknown | Solid | Unknown | Sniffer | Unknown |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 11-15-88 |
| Filter Cartridge | 2 Cartons (160 lbs) | Solid | Unknown | Sniffer | 11-15-88 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 11-15-88 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 6-21-89 |
| Filter Cartridge | Unknown | Solid | Unknown | Sniffer | 6-21-89 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 6-21-89 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 12-29-89 |
| Filter Cartridge | Unknown | Solid | Unknown | Sniffer | 12-29-89 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 12-29-89 |
| Separator Water | Unknown | Liquid | Separator | Unknown | 6-27-90 |
| Filter Cartridge | Unknown | Solid | Unknown | Unknown | 6-27-90 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 6-27-90 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 11-15-90 |
| Filter Cartridge | Unknown | Solid | Unknown | Unknown | 11-15-90 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 11-15-90 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 12-9-91 |
| Filter Cartridge | Unknown | Solid | Unknown | Unknown | 12-9-91 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 12-9-91 |
| Separator Water | Unknown | Liquid | Separator | Reclaimer | 7-22-92 |
| Filter Cartridge | Unknown | Solid | Unknown | Unknown | 7-22-92 |
| Still Bottom | Unknown | Unknown | Unknown | Unknown | 7-22-92 |

## Hazardous Waste Storage Information

| Type | Quantity | Physical State | Location | Method | Date |
|---|---|---|---|---|---|
| None | | | | | 1-8-80 |
| None | | | | | 9-23-85 |
| Filter Powder | Unknown | Solid | Unknown | Unknown | 9-27-88 |
| Unknown | Unknown | Unknown | Inside | Drum | Unknown |
| Unknown | Unknown | Unknown | Inside | Drum | 11-15-88 |
| Unknown | Unknown | Unknown | Unknown | Drum | 6-21-89 |
| Unknown | Unknown | Unknown | Inside | Drum & Spec. Cont. | 12-29-89 |
| Unknown | Unknown | Unknown | Inside | Drum | 6-27-90 |
| Unknown | Unknown | Unknown | Inside | Drum | 11-15-90 |
| Unknown | Unknown | Unknown | Inside | Drum | 12-9-91 |
| Unknown | Unknown | Unknown | Inside | Drum | 7-22-92 |

## Hazardous Waste Disposal (Including Spillage)

| Type | Quantity | Physical State | Location | Method | Date |
|---|---|---|---|---|---|
| Waste Liquid | Unknown | Liquid | Sewer | Drain | 1-8-80 |
| Dry Powder | Unknown | Solid | Sniffer vented to outside | Exhaust fans | 1-8-80 |
| Waste Liquid | Unknown | Liquid | Sewer | Drain | 9-23-85 |
| Filter Powder | Unknown | Solid | Unknown | Hold to haul | 9-27-88 |
| Separator Water Discharge | 120 gal/month | Liquid | Sewer | Unknown | 9-27-88 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | Unknown |
| Unknown | Unknown | Unknown | Unknown | Industrial Scavenger | Unknown |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 11-15-88 |
| Unknown | Unknown | Unknown | Unknown | Industrial Scavenger | 11-15-88 |
| Separator Water Dicharge | Unknown | Liquid | Sewer | Unknown | 6-21-89 |
| Unknown | Unknown | Unknown | Unknown | Industrial Scavenger | 6-21-89 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 12-29-89 |
| Unknown | Unknown | Unknown | Unknown | Industrial Scavenger | 12-29-89 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 6-27-90 |
| Unknown | Unknown | Unknown | Unknown | Industrial Scavenger | 6-27-90 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 11-15-90 |
| Still Bottom | 1 Drum | Unknown | Unknown | Industrial Scavenger | 11-15-90 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 12-9-91 |
| Filter Cartridges | 3 Drums/160 lbs | Solid | Unknown | Industrial Scavenger | 12-9-91 |
| Separator Water Discharge | Unknown | Liquid | Sewer | Unknown | 7-22-92 |
| Still Bottom | 1 Drum/100 lbs | Solid | Unknown | Industrial Scavenger | 7-22-92 |

Previous reports indicated shallow soil contamination by tetrachloroethene, acetone, and xylenes above acceptable levels. Groundwater was also contaminated by tetrachloroethene, trichloroethene, 1,2-dichloroethene, and chlorobenzene at levels above standards. An inside trough located along the northern and western walls of the building contained high levels of contamination.

The soil trench located inside of the building on site was excavated in order to remove the most heavily contaminated soil. Soil samples were screened with a Microtip photoionization detector. The excavated contaminated soil was stockpiled on and covered with polyethylene sheeting outside of the building. The area was backfilled with clean fill. Stockpiled soil samples were obtained for disposal purposes.

The contaminated soil stockpiled on site (72.92 tons) was removed on April 27, 1994 and disposed of on April 29, 1994 at E/Q Wayne Disposal Inc., a hazardous waste facility in Belleville, Michigan. A generator's US EPA ID number, NY0000228239, was obtained for the site in order to remove the soil.

Soil conditions encountered during drilling included fine to coarse grained sand, pebbles, silt and clay. According to information contained in U.S. Geological Survey Hydrologic Investigations Atlas HA-709 (Hydrologic Framework of Long Island, New York) and USGS Topographic Map - Hicksville Quadrangle, the land elevation of the site is approximately 125 feet above mean sea level. The Upper

Glacier aquifer is about 130 feet thick at the site. The Magothy aquifer extends from 5 to 205 feet below mean sea level. The Raritan confining unit is present from approximately -205 to -275 feet. The Lloyd aquifer extends from 275 to 445 feet below mean sea level. Top of bedrock is located at 445 feet below mean sea level (approximately 570 feet below grade).

There are no surface water bodies or wetlands located within one-half (.5) mile of the subject property. The closest public supply wells are located approximately 1,500 feet northwest of the subject site. Also, according to the U.S. Geological Survey Open-File Report 81-499 (Ground-Water Pumpage in Nassau County), the closest non-public supply well required to report groundwater pumpage is located approximately 1,100 feet southeast of the property.

## INITIAL DATA QUALITY OBJECTIVES

The objective of this IRM is to address the soil contamination related to the subject site. The following tasks will be performed in order to reach the above objective:

1. The soil contamination plume will be delineated both vertically and areally. Borings will be drilled. The soil samples will be screened with a photoionization detector (PID) and submitted for laboratory analysis of Volatile Organics.

2. Soil characteristics will be determined in order to assess the applicability of Soil Vapor Extraction at the site. Pilot testing will be performed to determine information such as the areas of influence and projected rate of contaminant removal.

3. Remediation design parameters will be evaluated based upon all of the information collected. These parameters will be utilized to properly design and specify the Soil Vapor Extraction System (SVES).

## IRM ACTIVITIES

Tyree Brothers Environmental Services, Inc. (TBES) proposes to perform the following activities at the subject property:

1. Soil Contamination Plume Delineation

It is recommended that the shallow soil contamination be completely delineated to acceptable levels (Recommended Soil Clean-up Objectives). A Geoprobe soil sampling drilling rig will be utilized to obtain split spoons at thirteen (13) locations at six (6) to eight (8) feet, ten (10) to twelve (12) feet, and eighteen (18) to twenty (20) feet. (The deepest soil contamination above acceptable levels was noted at six (6) to eight (8) feet.) All sampling equipment will be steam cleaned between boreholes. All boreholes will be backfilled with clean sand after completion. Drilling activities and sampling will be supervised by a hydrogeologist.

The soil samples will be screened with a Photovac Microtip photoionization detector. The sample from the bottom of each borehole and the remaining sample with the highest PID reading from each borehole will be submitted to Environmental Testing Laboratories (ETL), a New York State certified laboratory, for analysis by GC/MS for Volatile Organics via EPA method 8240. (It has been determined by CLP protocol that the only contaminants noted above acceptable levels in the soil were tetrachloroethene, acetone and xylenes.)

After the initial laboratory results are reviewed, additional soil borings/sampling may be performed if the shallow soil plume has not been delineated to acceptable levels. All results would be plotted on a contamination contour map. The proposed locations of the initial soil sampling points are included on Figure 1 - Proposal Map. The locations of these boreholes were based upon the soil sampling results of the PSA (as indicated by the tetrachloroethene concentrations plotted on the Proposal Map).

No cuttings are produced when advancing the sampling probes. Therefore, potential contaminated soil generation is minimal.

It should be noted that this work was previously approved by the NYSDEC. Some of the borings have already been performed.

## 2. SVES Remediation Design

The Remedial Plan for the IRM consists of in situ Soil Vapor Extraction. Soil vapor or vacuum extraction is the process of removing and treating volatile organic compounds (VOC) from the vadose or unsaturated zone. The technology uses extraction and monitoring wells, manifold piping, a vapor and liquid separator, a vacuum pump, and, if needed, an emission control device. The vacuum pump draws the subsurface contaminants from the extraction wells to the liquid/gas separator, and the contaminants are then discharged to the atmosphere.

The technology proposed is effective in virtually all hydrogeologic settings and can reduce soil contaminant levels to undetectable. The vacuum extraction process was first demonstrated at a Superfund site in Puerto Rico and has since been applied at many other sites. Under the USEPA Superfund Innovative Technology Evaluation (SITE) Program, the process was demonstrated at the Groveland Wells Superfund site in Groveland, Massachusetts from December 1987 through April 1988. During the 56-day operational period, the process successfully removed 1,300 pounds of VOCs, mainly trichloroethylene (TCE) from both highly permeable strata and low permeability clays.

The process achieved undetectable levels of VOCs at some locations and reduced the VOC concentrations in soil gas by 95 percent. The major considerations in applying this technology are volatility of the contaminants and site soils. Both of these considerations are well suited to the Forest Avenue site.

The soils at the site are medium sands with a high permeability; and the contaminants of concern are trichloroethylene (TCE) and tetrachloroethylene (PCE) which have Henry's Law constants of $9.9 \times 10^{-3}$ and $1.5 \times 10^{-2}$ atm-$m^3$/mole, respectively. Compounds with Henry's Law constants greater than $10^{-5}$ atm-$m^3$/mole indicate a "strippable" volatile constituent.

To finalize the design parameters for the soil vapor extraction system, TBES will conduct an SVE pilot test. Specific information that will be obtained includes the radius of influence, applied vacuum, applied flow rate, and air contaminant concentration.

A schematic of the proposed pilot test is shown in Appendix 3.

3. Miscellaneous Information

Site Preparation

The site is currently undergoing construction by a private contractor. The building (which is currently vacant) is being converted to a retail shoe store. A portion of the area to the north of the existing building that is currently vegetated with grass will be regraded and paved to allow for additional parking areas. The parking area will extend approximately fifty (50) feet to the north of the building. The remaining vegetated area to the northern property line (approximately ninety (90) feet) will not be regraded. Stormwater leaching basins will be installed in the parking areas to allow rainwater discharge.

The construction is scheduled to be completed by July 1995. The site is currently accessible to drilling and sampling equipment. Additional access will be available after construction is completed. The utilities in the building are also expected to be operational at that time. Currently, potable water for decontaminating purposes is piped via garden hose from an adjacent business (Cove 1-Hour Photo) to the east.

A sheet of 6-mil reinforced polyethylene sheeting will be emplaced in an unutilized location on the property in order to decontaminate the sampling equipment with a pressure washer. A separate sheet of polyethylene will be used to allow the split spoons to air dry.

No 55-gallon drums are expected to be necessary to contain waste. The only drum to possibly be used on the property would be an air/water separator drum utilized for the SVES.

Diagrams and Specifications

Four (4) venting wells have already been installed at the site under the supervision of the NYSDEC. These wells are located near the corners of the existing building. As shown on Figure 2 - Site Map in Appendix 1, the wells have been manifolded together with four-inch PVC piping. A four-inch PVC ball valve and vacuum gauge are also located adjacent to each venting well. A Typical Venting Well Detail is included in Appendix 2.

The SVES will be located on a concrete pad near the eastern property line. The SVES will consist of a regenerative blower, an air/water separator, an in-line filter, gauges, effluent piping, and a sampling port. A carbon adsorption drum will also be installed prior to the effluent piping if results indicate levels above acceptable air discharge limits. A schematic of a typical SVES is included in Appendix 3.

Excavation

No further excavation is expected to be performed in conjunction with the IRM Program.

Waste Handling

Future waste disposal may include contaminated boring cuttings and saturated carbon adsorption drums. Minor amounts of contaminated soil may be generated during split spoon soil sampling. The soil not being submitted to the laboratory will be stockpiled on a 6-mil reinforced polyethylene liner. After all of the soil is stockpiled, the liner will be used to cover the soil securely to protect it from the outside elements. The amount of soil will be estimated by measuring the approximate length, width, and height of the pile.

If carbon drums are necessary to treat effluent air from the SVES, they will be utilized until breakthrough is reached. At that time, a new carbon drum will be installed if levels still mandate off-gas treatment. The spent drum will be capped and stored in the recovery area on site no more than ninety (90) days while awaiting disposal. A proper label will be attached to the drum.

Waste Characterization

The stockpiled soil will be sampled for disposal purposes. A composite sample will be obtained in order to assess if the soil exhibits hazardous characteristics. The stockpile will be sampled with a clean steel scoop in various locations to evenly assess the soil. The sample will be obtained by digging into the soil pile at least six (6) inches. All samples will be logged on a laboratory-supplied chain of custody document (see Appendix 4 for an example of the chain of custody).

The soil sample will be analyzed for RCRA characteristics, i.e. ignitability, reactivity, corrosivity, and toxicity (volatiles and metals). The results of the analyses will determine if the soil will be classified as hazardous waste. No other waste types will be mixed with the soil.

The carbon drum will also be sampled after breakthrough occurs. A clean steel scoop will be utilized to obtain a composite sample of the carbon. The sample will be taken by digging into the carbon at least six (6) inches. All samples will be logged on a laboratory-supplied chain of custody document.

The sample will be analyzed for RCRA characteristics, i.e. ignitability, reactivity, corrosivity, and toxicity (volatiles and metals). The results of the analyses will determine if the carbon will be classified as hazardous waste. No other waste types will be mixed with the carbon.

Waste Preparation

The waste will be prepared for transportation and disposal once the laboratory analytical results are received. If the waste is classified non-hazardous based upon its RCRA characteristics, a Waste Profile Sheet and Non-Hazardous Waste Manifest will be prepared. Examples of these documents are shown in Appendix 5. Once these documents have been signed by the generator (Bedford Affiliates), the transportation and disposal will be scheduled.

If the waste is classified hazardous based upon its RCRA characteristics, a Waste Profile Sheet and Uniform Hazardous Waste Manifest will be prepared (see Appendix 5). Another sample will also be obtained (as described above) and sent to the proposed disposal facility. The facility will perform a treatability study on the waste. After acceptance by the facility, the transportation and disposal will be scheduled. All documents will be signed by the generator.

Waste Disposal

Contaminated soil will be transferred into a dump trailer with a loader. The top of the trailer will be secured with a cover. The soil will be transported to the disposal facility under the appropriate waste manifest.

If the soil is non-hazardous, it will be disposed of at S & W Waste, 105 Jacobus Avenue, South Kearny, New Jersey, 07032 (US EPA ID Number NJD991291105) by stabilization and landfilling. If the soil is hazardous, it will be disposed of at Michigan M.D.I. (E/Q Wayne Disposal Inc.), 49350 N. I-94 Service Drive, Belleville, Michigan, 48111 (US EPA ID Number MID04090633). The soil will be treated by physical and chemical processes after being mixed with similarly contaminated material. After testing indicates that the material is within acceptable limits, it is then landfarmed at the disposal facility.

A carbon drum will be transferred into a rack truck and transported to the disposal facility. If the waste is non-hazardous, it will be disposed of at S & W Waste, 105 Jacobus Avenue, South Kearny, New Jersey, 07032 (US EPA ID Number NJD991291105) by stabilization and landfilling. If the waste is hazardous, it will be disposed of at Michigan M.D.I. (E/Q Wayne Disposal Inc.), 49350 N. I-94 Service Drive, Belleville, Michigan, 48111 (US EPA ID Number MID04090633). The waste will be treated by physical and chemical processes after being mixed with similarly contaminated material. After testing indicates that the material is within acceptable limits, it is then landfarmed at the disposal facility.

Sampling Program For Residual Contamination

After no further contamination is being removed from the soil by the SVES, soil borings will be performed using a hollow stem auger drilling rig. Split spoon samples will be obtained as described subsequently. Five (5) borings will be drilled to the water table, and split spoon soil samples will be obtained every ten (10) feet. The samples will be screened with a PID. The two (2) samples with the highest PID readings from each boring will be submitted to ETL for analysis by GC/MS of Volatile Organics via EPA method 8240. The borings will be drilled adjacent to the northern and western walls of the building (see Figure 3 in Appendix 1). All results will be documented in the IRM Report.

Decontamination Procedures

Prior to sampling, the nickel sample tubes and stainless steel spoons will be hand scrubbed with a laboratory detergent (Microwash) mixed with clean water in an adequately sized basin. After cleaning, the samplers will be scrubbed with clean water to remove all residue detergent. The samplers will then receive a final double rinse with distilled water. After rinsing, the sampling equipment will be steam cleaned and then allowed to air dry.

Sampling rods and associated equipment will be pressure washed between boreholes. These rods and equipment will also be washed prior to leaving the site.

All appropriate personnel decontamination procedures are outlined in the enclosed Health and Safety Plan. All proper procedures will be followed.

Site Restoration

After the soil is determined to be remediated to NYSDEC clean-up objectives, the SVES equipment located in the recovery area will be removed from the site. All manifold piping will be cut and capped. The gauges and ball valves will be removed, and the manhole pits will be cemented to grade. In addition, the venting wells will be properly abandoned.

Abandonment procedures shall be performed as follows. The portion of the well occupied by the screen shall be filled with clean sand. The clean sand will not extend above the top of the screen. The entire casing shall be filled with a cement/bentonite grout. The grout shall be placed under pressure through pipes to the bottom of the space to be filled. The placing of the grout shall be continuous until grout appears at the top of the casing, at which time the grout pipe will be withdrawn.

After the grout has consolidated as confirmed by visual inspection, the top of the casing will be closed and sealed. A PVC cap will be permanently affixed to the casing. The well manhole will be filled with concrete after the well has been grouted and capped. The manhole cover may then be reinstalled.

5. Schedule

The following is a schedule for the anticipated performance of the above-mentioned proposed work (all time periods are measured from the date written approval is received from the NYSDEC by Bedford Affiliates and TBES, unless otherwise noted):

| | |
|---|---|
| 1. Initial Geoprobe Survey - | by June 30, 1995 |
| 2. Initial soil contamination plume map - | by July 15, 1995 |
| 3. SVES pilot testing - | within 90 days |
| 4. Pilot testing data analysis - | within 120 days |
| 5. SVES remediation design - | within 180 days |
| 6. SVES installation - | within 240 days |
| 7. SVES operation - | within 300 days |
| 8. Residual contamination sampling - | within 90 days of cessation of contaminant removal |
| 9. Site restoration - | within 60 days of NYSDEC determination that soil has been remediated to acceptable levels |
| 10. IRM Report generation- | within 90 days of site restoration |
| 11. Waste disposal- | within 90 days of generation |

## SAMPLING AND ANALYSIS PLAN

### Quality Assurance/Quality Control Protocol

In addition to the procedures mentioned below, the following measures will be taken to avoid cross contamination of samples:

1. If two or more boreholes are being sampled, the borings anticipated to be less contaminated are sampled first. All equipment is always cleaned and decontaminated between soil samplings.

2. Upon completion of sampling, all sampling equipment is cleaned and decontaminated on site prior to returning to TBES's headquarters.

All samples will be uniquely identified, and information associated with each sample will be recorded on container labels and the chain of custody document. The sample containers slated for laboratory analysis will be immediately placed on ice and kept refrigerated until hand delivered to the laboratory. Chain of custody documents will be kept with all samples at all times.

Trip and field blanks will also be obtained. Trip blanks will be supplied by the laboratory. The laboratory will also supply deionized water for the field blanks. The deionized water will be poured over a sample tube prior to use. QA/QC samples will be analyzed for all parameters to check for possible cross contamination due to sampling equipment or transport. It should also be noted that ETL will perform all internal laboratory QA/QC as specified for EPA method 8240.

The following table is a summary of the sampling parameters and protocols to be utilized for sampling and analysis:

| EPA Method | Matrix | Sample Container | Sample Preservation | Maximum Holding Time |
|---|---|---|---|---|
| 8240 | Soil | 22 ml glass jar w/ teflon septum | 4°C, no headspace | 14 days |
| 624 | Liquid | 40 ml glass vial w/ teflon septum | 4°C, no headspace, HCl preserved | 14 days |

Based upon the proposed work, the following number and types of samples will be obtained during the initial plume delineation:

| Type | EPA Method | Number | Location |
|---|---|---|---|
| Soil | 8240 | 26 | 1 from either 6 - 8 or 10 - 12 feet in each of 13 borings<br>1 from 18-20 feet in each of 13 borings |
| Blanks: | | | |
| Trip Blank | 624 | 1 | 1 for drilling event |
| Field Blank | 624 | 2 | 1 for each day of drilling |

The following number and types of samples will be obtained during the sampling for residual contamination:

| Type | EPA Method | Number | Location |
|---|---|---|---|
| Soil | 8240 | 10 | 2 from 0 - 90 feet in each of 5 borings |
| Blanks: | | | |
| Trip Blank | 624 | 1 | 1 for drilling event |
| Field Blank | 624 | 3 | 1 for each day of drilling |

Ms. Marybeth Puckace will be utilized as a data validation expert. Ms. Puckace's qualifications and experience were previously submitted to the NYSDEC. Another copy is included as Appendix 6.

Field Sampling Plan

1. Soil Sampling Protocol

Soil samples will be obtained during drilling. Prior to sampling, the nickel sample tubes and stainless steel split spoons will be hand scrubbed with a laboratory detergent (Microwash) mixed with clean water in an adequately sized basin. After cleaning, the samplers will be scrubbed with clean water to remove all residue detergent. The samples will then receive a final double rinse with distilled water. After rinsing, the sampling equipment will be steam cleaned and then allowed to air dry.

If samples are collected with the Geoprobe, soil sampling probes are utilized. During the collection of discrete soil samples, the sampling tube remains completely sealed by a locked inner piston while the tube is driven to the desired depth. When the target depth is reached, a tool is inserted within the drive rods to the top of the sampling tube. The tool releases the sampling tube's inner piston from its locked position. The tube is then driven through the soil a distance of two (2) feet, filling the tube with soil. The rods are withdrawn from the hole, and the sample barrel is retrieved. The sample can then be removed from the tube and placed in bottles, or the ends of the tube can be capped, and the entire tube sent for analysis.

If samples are collected with a hollow stem auger drilling rig, split spoons are utilized. When the desired sampling depth is reached, the split spoon sampler will be threaded onto steel rods and lowered to the sampling horizon. A 140-pound hammer will then be repeatedly dropped onto a collar on the rods a distance of thirty (30) inches. Hammering will continue until the sample has been driven two (2) feet into the soil. The sampler will then be retrieved from the borehole and disconnected from the rods.

The sampler will be opened, and the soil lithologies present will be visually noted and logged. Following visual examination, each sample will be placed in two (2) pre-cleaned (laboratory supplied) 22-milliliter containers that have a teflon lined cover. The soil will be settled and capped to insure that little or no headspace is present within the sample. Sample containers will then be placed on blue ice until brought to the laboratory. All samples will be uniquely identified, and all information associated with the samples will be recorded on a chain of custody document.

2. Photoionization Meter Screening Procedures

After sampling, a portion of each soil sample will be placed in clean airtight containers and set aside in order to allow volatilization from the soil. The samples will be kept out of direct sunlight in order to inhibit excessive moisture accumulation. Also, the samples will be protected from excessively cold conditions to enhance volatilization.

After being allowed to volatilize, the samples will be screened with a Photovac Microtop photoionization meter using headspace analysis. This meter measures the concentrations of organic vapors in air as they evolve from the sediment sample. The numerical readouts are not exact determinations of true volatile contents of the samples, but instead provide qualitative indications of the degree of volatile organic contamination. The photoionization meter will be calibrated to a standard gas prior to screening the samples.

The probe of the meter will be inserted into the sample headspace, and the meter will be allowed to come to equilibrium with the sample concentrations. The meter furnishes direct readings of volatile concentrations in parts per million on a liquid crystal display. The individual reading for each sample will be indicated on the boring logs.

Laboratory Information

The laboratory to be used for the analysis of the samples to be collected is Environmental Testing Laboratories, Inc., 208 Route 109, Farmingdale, New York 11735. ETL is a NYSDOH-certified laboratory. Quality assurance/quality control protocols in addition to other general information regarding ETL are included in Appendix 7. All ETL analytical data will be validated by Ms. Puckace.

## HEALTH AND SAFETY PLAN

Attached as Appendix 8 is the Health and Safety Plan as previously approved by Mr. Joe Mazzurco, a certified health and safety professional. The same Health and Safety procedures will be implemented for the IRM as was utilized previously for the PSA.

## CONTINGENCY PLAN

A contingency plan will be implemented in the event that any element of the IRM Program fails to operate in accordance with the approved IRM Work Plan. This will be accomplished by the following:

1. Alternate equipment will be available in case proposed equipment cannot perform the required work. For example, a drilling rig will be utilized if the Geoprobe cannot obtain samples.

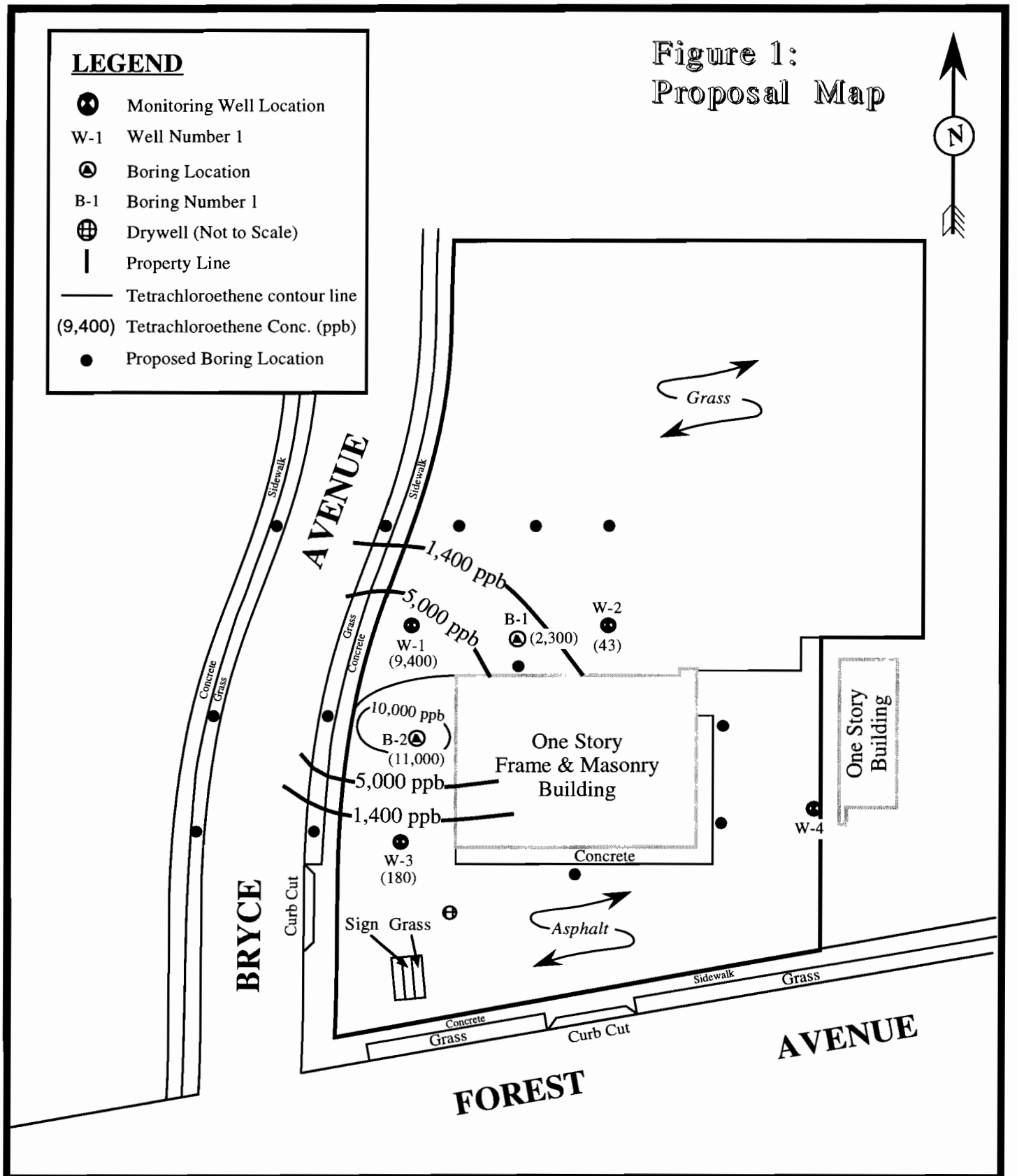
2. An extra container will be filled for each sample in order to assure analysis will be performed even in the event of sample breakage.

3. Additional venting wells will be installed and tied into the existing manifold piping if it is determined that the current layout cannot adequately address all of the soil contamination at the site.

# APPENDIX 1

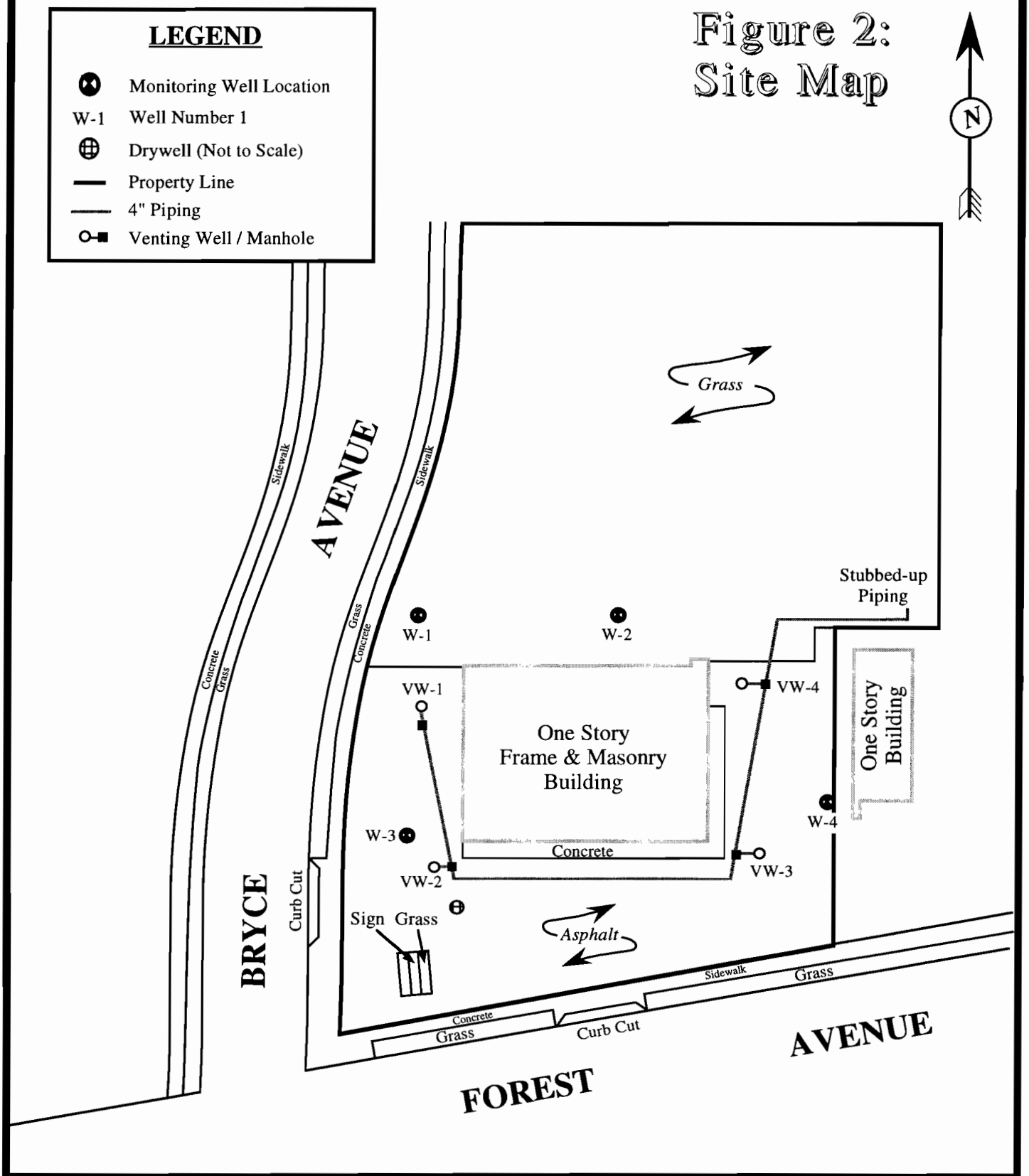
# MAPS

# Figure 1: Proposal Map



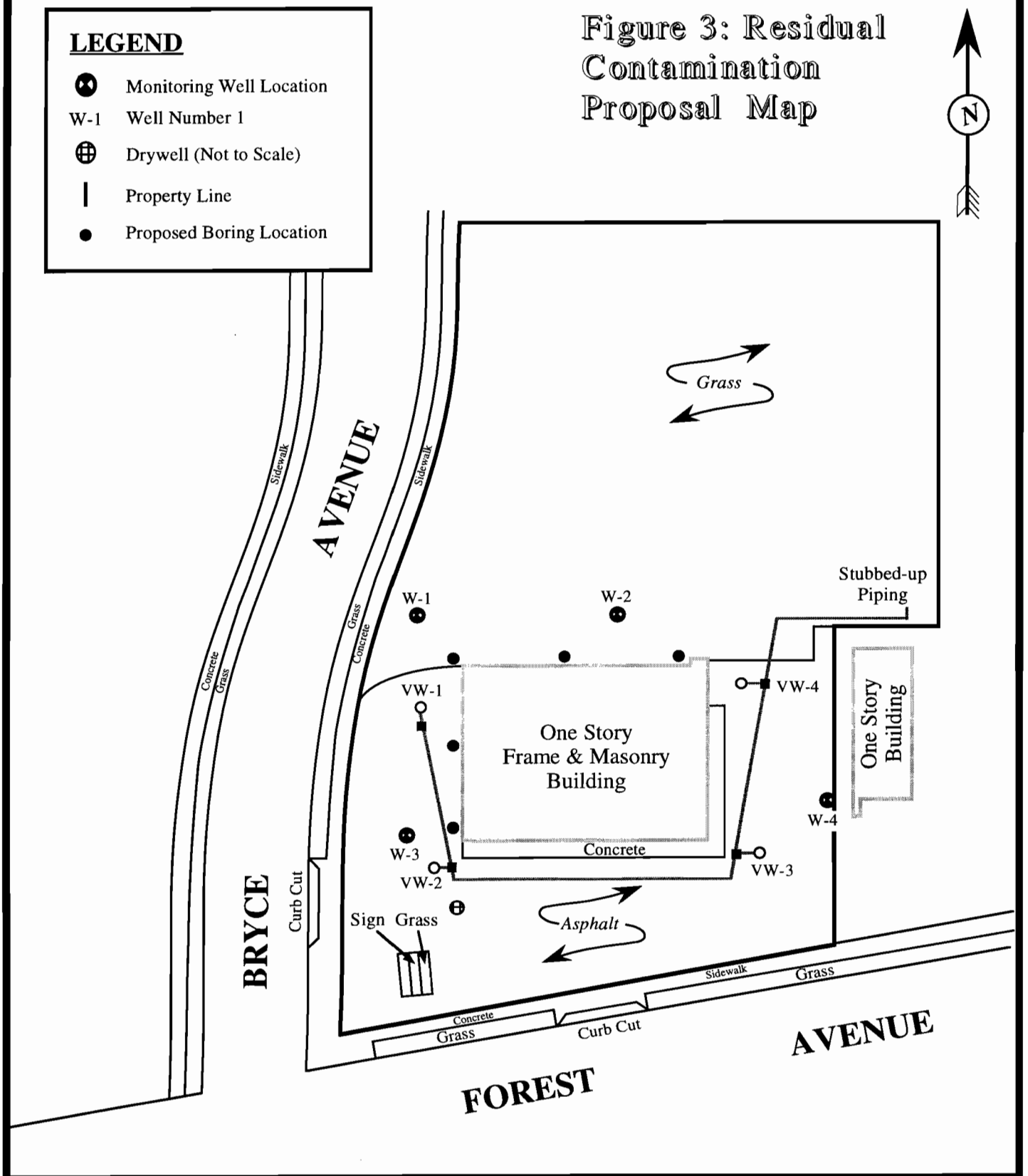

| | | |
|---|---|---|
| **Tyree Brothers**<br>**Environmental Services, Inc.**<br>208 Route 109<br>Farmingdale, New York 11735 | ***Ron Hill Cleaners***<br>*71 Forest Avenue*<br>*Glen Cove, NY 11542* | **DRAWN BY:** D. Medaglia<br>**SITE CODE:** 1-30-071<br>**SCALE:** 1" = 40'<br>**DATE:** 5/19/95 |

# Figure 2: Site Map




| | | |
|---|---|---|
| **Tyree Brothers Environmental Services, Inc.**<br>208 Route 109<br>Farmingdale, New York 11735 | ***Ron Hill Cleaners***<br>*71 Forest Avenue*<br>*Glen Cove, NY 11542* | **DRAWN BY:** D. Medaglia<br>**SITE CODE:** 1-30-071<br>**SCALE:** 1" = 40'<br>**DATE:** 1/7/95 |

# Figure 3: Residual Contamination Proposal Map

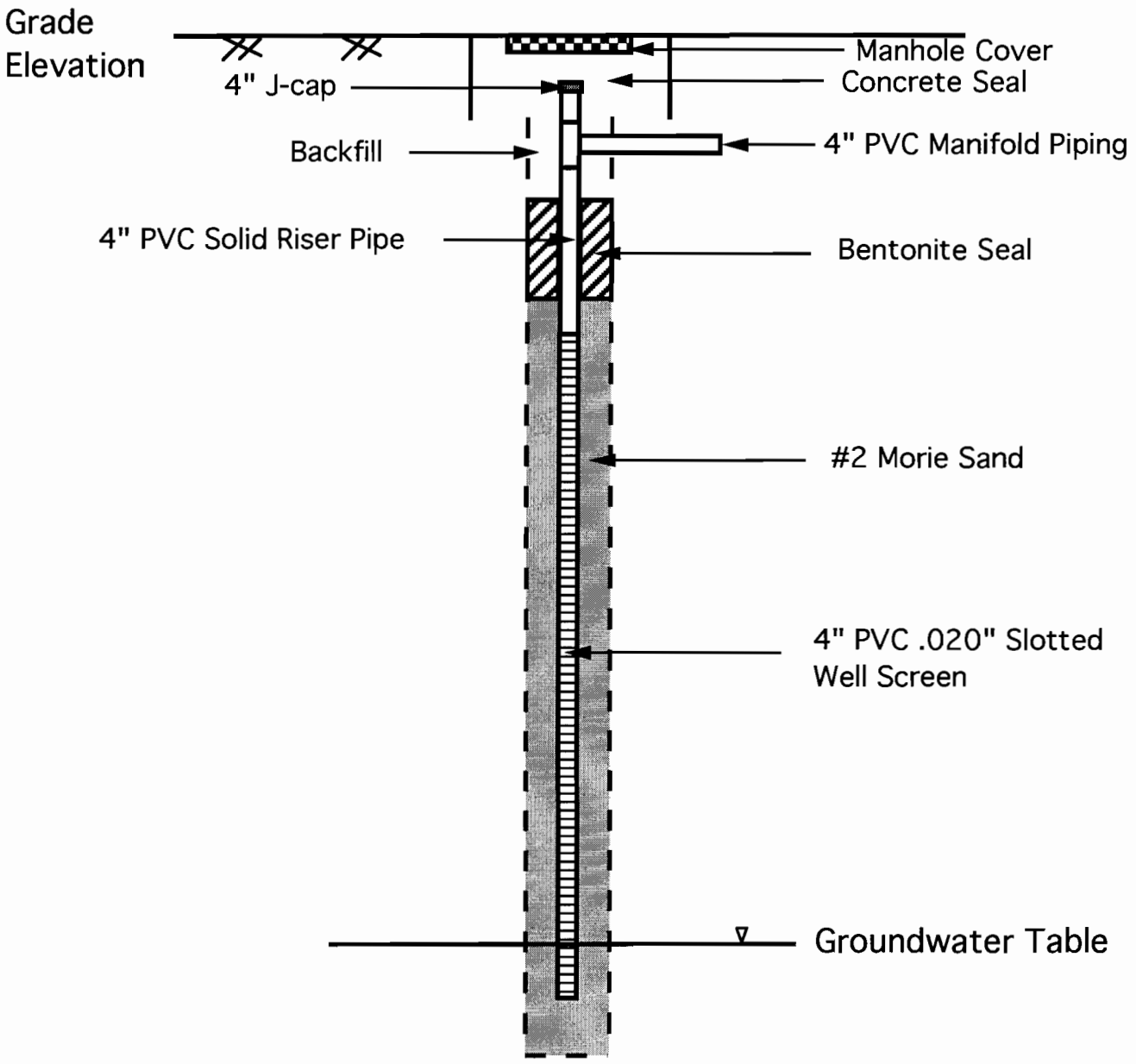



| | | |
|---|---|---|
| **Tyree Brothers Environmental Services, Inc.**<br>208 Route 109<br>Farmingdale, New York 11735 | ***Ron Hill Cleaners***<br>*71 Forest Avenue*<br>*Glen Cove, NY 11542* | **DRAWN BY:** D. Medaglia<br>**SITE CODE:** 1-30-071<br>**SCALE:** 1" = 40'<br>**DATE:** 5/19/95 |

# APPENDIX 2

# TYPICAL VENTING WELL DETAIL

# TYPICAL VENTING WELL DETAIL

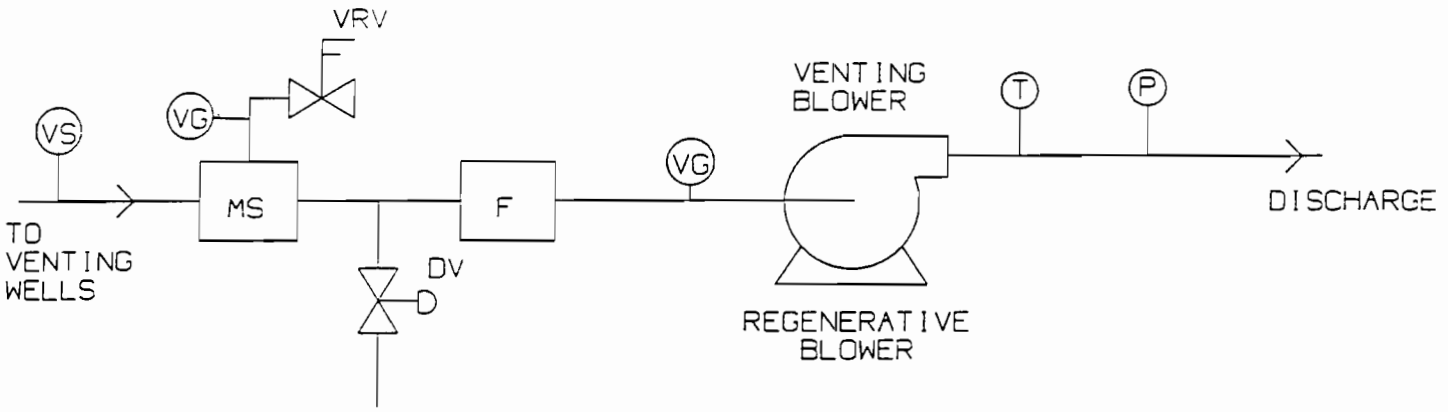



Not to Scale

# APPENDIX 3

# SVES SCHEMATIC

# SOIL VENTING UNIT




LEGEND:

| | |
|---|---|
| CV - CHECK VALVE | PRV - PRESSURE RELIEF VALVE |
| DV - DILUTION VALVE | RC - RUBBER COUPLING |
| F - FILTER | T - TEMPERATURE GAUGE |
| MS - MOISTURE SEPARATOR | VG - VACUUM GAUGE |
| P - PRESSURE GAUGE | VS - VACUUM SWITCH |
| | VRV - VACUUM RELIEF VALVE |

# APPENDIX 7

# ETL INFORMATION

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

# E.T.L.'s CORPORATE QUALIFICATIONS

Member
Tyree Environmental Technologies

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax 516-249-8344 Phone 516-249-1456

# Section 1

## TYREE ENVIRONMENTAL TECHNOLOGIES
## Environmental Testing Laboratories, Inc.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 Fax: 516-249-8344 Phone: 516-249-1456

# Section 2

## QUALITY ASSURANCE PROGRAM

# Appendix

I. Certifications

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

## Section 1

# Tyree Environmental Technologies
## Environmental Testing Laboratories Inc.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 Fax: 516-249-8344 Phone: 516-249-1456

# Tyree Environmental Technologies
## Environmental Testing Laboratories, Inc.

### IA. BACKGROUND

Larry E. Tyree Co., Inc. was founded in 1930 by Larry E. Tyree. He was joined by his sons Joe and Bill in the late 40's. The company grew and prospered to its present headquarters in Farmingdale, New York. The company became the No. 1 installer of underground fiberglass tanks. Joe Tyree retired in 1985. Bill Tyree and his four sons, Bill, Tom, Larry and Stephen, have escalated and expanded the diversified company whose total sales in 1989 exceeded 40 million. Larry E. Tyree Co., Inc. specializes in the construction of service stations and the installation of fuel tanks and accompanying equipment including the servicing and maintenance of same.

Tyree Brothers Environmental Services, Inc. was founded in 1986 to handle the rapidly growing environmental needs of the industrial and petroleum industries. The company offers a wide variety of services that include site assessments for divestments, acquisitions, and subsurface groundwater evaluations; drilling capabilities for sampling and monitoring well installations; removal and disposal of contaminated soil and water; the design, construction and maintenance of petroleum recovery systems; petro-tite tank testing; a six truck vacuum service fleet; sampling and monitoring services; on-site soil remediation using our mammoth Soil Incinerating Unit; and 24 hour emergency spill remediation.

The Tyree Organization was founded in 1988 in Brewster, New York and later expanded to its current facility in Danbury, Connecticut. This company is run by Tom Tyree and offers the combined services of all three companies. The location of this facility has given TET the ability to extend its operating area to include, New York State and the lower New England states.

208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

The Tyree Organization Delaware Valley Branch, located in Burlington Township, New Jersey, was formed in 1989. This facility, originally based in Riverside, New Jersey, later relocated in order to serve the Delaware Valley and its surrounding area.

TET's newest satellite offices are located in Auburn, Massachusetts and Syracuse, New York.

Environmental Testing Laboratories, Inc. (ETL). was established in 1988 at the Farmingdale Headquarters. It is full service environmental testing laboratory with its primary functions being the analysis of water, soil and hazardous waste for heavy metals and organic compounds. Asbestos sampling and analysis is its latest addition to the ever-increasing analytical capabilities.

Environmental Testing Laboratories, Inc.
208 Route 109 Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

TABLE 1

1. ETL ANALYTICAL CAPABILITIES

I. ORGANICS-GC/MS

Volatile Organics-524
Volatile Organics-624
Volatile Organics-8240
Volatile Organics-CLP
Acid & Base Neutrals-625
Acid & Base Neutrals-8270
Acid & Base Neutrals-CLP
Pesticides PCBs-625
Pesticides PCBs-8270
PCB-Selective Ion Monitoring
Library Search
Appendix VII-VOA
Appendix VII-Heated Purge & Trap
Appendix VII-Extractables
Appendix VIII-VOA
Appendix VIII-Heated Purge & Trap
Appendix VIII-Extractables
Appendix IX-VOA
Appendix IX-Heated Purge & Trap
Appendix IX-Extractables
ECRA Volatiles
ECRA Extractables
NJDEP X-195 Volatiles
NJDEP X-195 Extractables
Petroleum Refinery Waste-VOA
Petroleum Refinery Waste-Extractables
TCLP-Volatiles
TCLP-Direct Aqueous Inject-VOA
TCLP-Extractables

II. ORGANICS-GC

Volatile Organics-502.2
Purgeable Halocarbons-601/8010
Purgeable Halocarbons-602/8020
Non-Halogenated Volatile Organics-8015
EDB & DBCP-504
Phenols-604/8040
Organohalide Pesticides & PCBs-505
Chlorinated Pesticides-508
Chlorinated Pesticides & PCBs-608/8080
Chlorinated Pesticides & PCBs-CLP
Polynuclear Aromatic Hydrocarbon-610/8100
Chlorinated Hydrocarbons-612/8120
Chlorinated Herbicides-515
Organohalide Pesticides & PCBs-617
BTX, BTEX
Appendix VII Pesticides & PCBs
Appendix VII Herbicides
Appendix VII HPLC
Appendix VIII Pesticides & PCBs
Appendix VIII Herbicides
Appendix VIII HPLC
Appendix IX Pesticides & PCBs
Appendix IX Herbicides
ECRA Pesticides & PCBs
NJDEP X-195 Pesticides & PCBs
Drinking Water Pesticides
Drinking Water Herbicides
EPTOX Pesticides
EPTOX Herbicides
TCLP Pesticides
TCLP Herbicides

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# E.T.L.'s CORPORATE QUALIFICATIONS

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Environmental Testing Laboratories, Inc.
208 Route 109 Farmingdale NY 11735 Fax. 516-249-8344 Phone 516-249-1456

# Section 1

## TYREE ENVIRONMENTAL TECHNOLOGIES
## Environmental Testing Laboratories, Inc.

# Section 2

## QUALITY ASSURANCE PROGRAM

Environmental Testing Laboratories, Inc.
208 Route 109 · Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

# Appendix

I. Certifications

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208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

## Section 1

# Tyree Environmental Technologies
## Environmental Testing Laboratories Inc.

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|---|---|
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| Pesticides/PCBs-625 | Chlorinated Pesticides-508 |
| Pesticides PCBs-8270 | Chlorinated Pesticides & PCBs-608/8080 |
| PCB-Selective Ion Monitoring | Chlorinated Pesticides & PCBs-CLP |
| Library Search | Polynuclear Aromatic Hydrocarbon-610/8100 |
| Appendix VII-VOA | Chlorinated Hydrocarbons-612/8120 |
| Appendix VII-Heated Purge & Trap | Chlorinated Herbicides-515 |
| Appendix VII-Extractables | Organohalide Pesticides & PCBs-617 |
| Appendix VIII-VOA | BTX, BTEX |
| Appendix VIII-Heated Purge & Trap | Appendix VII Pesticides & PCBs |
| Appendix VIII-Extractables | Appendix VII Herbicides |
| Appendix IX-VOA | Appendix VII HPLC |
| Appendix IX-Heated Purge & Trap | Appendix VIII Pesticides & PCBs |
| Appendix IX-Extractables | Appendix VIII Herbicides |
| ECRA Volatiles | Appendix VIII HPLC |
| ECRA Extractables | Appendix IX Pesticides & PCBs |
| NJDEP X-195 Volatiles | Appendix IX Herbicides |
| NJDEP X-195 Extractables | ECRA Pesticides & PCBs |
| Petroleum Refinery Waste-VOA | NJDEP X-195 Pesticides & PCBs |
| Petroleum Refinery Waste-Extractables | Drinking Water Pesticides |
| TCLP-Volatiles | Drinking Water Herbicides |
| TCLP-Direct Aqueous Inject-VOA | EPTOX Pesticides |
| TCLP-Extractables | EPTOX Herbicides |
| | TCLP Pesticides |
| | TCLP Herbicides |

# Environmental Testing Laboratories, Inc.

208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456


## III. INORGANIC-CONVENTIONALS

Acidity, Alkalinity
Ammonia
Ash
Bicarbonate
Bromide
Carbonate
Chloride
Chlorine
COD
Color
Cyanides
Density
Fluoride
Hardness
Langelier Index
Nitrate, Nitrite
Nitrogen, Organic
Nitrogen, Total Kjeldahl
Odor, Oil & Grease
Petroleum Hydrocarbons
pH
Phenols
Reactive Cyanide, Reactive Sulfide
Salinity
Silica
Solids, Total
Solids, Total Dissolved
Solids, total Settleable
Solids, total Suspended
Solids, Total Volatile
Specific Conductance
Sulfate, Sulfide, Sulfite
Surfactants
Turbidity

## IV. INORGANIC METALS

ICAP Metals
Furnace Metals
Flame Metals
Hydride Metals
CLP Metals

## V. WASTE ANALYSES

EPTOX Extraction
EPTOX Parameters
TCLP Extraction
TCLP Parameters
Physical Compatibility
Chemical Compatibility
Flashpoint
Ignitability
Corrosivity
Reactivity

## VI. SPECIAL CHEMISTRY

Methods Development, Organic & Inorganic Compounds
Incinerator Test Burn Analyses
Client Specific Pesticides/Herbicide Analyses

## VII. MICROSCOPICAL EXAMINATIONS

Asbestos in Air
Asbestos in Friable Bulk Material
Asbestos in Non Friable Bulk Material
Asbestos in Water
Iron Bacteria in Water

2. Turnaround Time

Environmental Testing Laboratories, Inc. (ETL's) turnaround time is structured to meet the needs of our clients. We can offer priority turnaround of 24 to 48 hours or 3 to 5 days depending on the analytical type and number of samples. Our normal turnaround varies between 7 to 10 working days.

3. Report Requirements

ETL produces a technical report to conform to a specified regulatory format or results in a tabulated summary.

## IB. RESEARCH & DEVELOPMENT

ETL is staffed with experienced environmental scientists and engineers who are capable of designing and developing site-specific analytical programs. These individuals will review the clients needs and determine the best technological and economically feasible approach within the specified regulatory framework.

## IC. SUBCONTRACT SERVICES

Under "extraordinary" circumstances, ETL may find that it is necessary to subcontract out portions of the sampling or analytical needs of the client. These would be items that, due to the short holding time, may require them to be subcontracted to insure proper handling. ETL will only subcontract with others that meet our demanding QA/QC and reporting requirements. At no time will we subcontract work unless it is done up to ETL standards of performance.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 Fax: 516-249-8344 Phone: 516-249-1456

## ID. FIELD SERVICES

### 1. Sampling

ETL co-ordinates all aspects of the clients needs. Any work need on a site can be directed by our consulting staff if the client prefers. With the client, prior to the project, we can initiate a work plan to follow the proper QA/QC. Topics of discussion are: site directions, sample point location, history of each sampling point, protection to be used at the site, decontamination procedures, safety plans, level of equipment, vehicle usage, field QC, location preparation and sample shipment requirements.

It is the absolute goal of sample collection personnel to collect representative samples and to preserve them for chemical integrity. With this accomplished, the objectives of the environmental monitoring program to determine the presence or absence of contaminants can be achieved. Based on accuracy, starting at sampling, they may then prescribe remedial programs.

Our professional staff can provide the client with sampling protocols to obtain representative sampling to insure quality control and proper documentation. A well designed sampling effort is invaluable in determining the full extent and nature of the contamination. Proper sampling schedules can save countless man hours during the remediation. Our staff is experienced in the use of air monitoring and asbestos sampling as well.

## 2. ETL SAMPLE DELIVERY

ETL provides sample transportation coolers for shipment to insure proper thermal preservation of analytical samples. The coolers are prepared at ETL to include proper sample containers to cover requested analysis. All sample containers used by ETL conform to the criteria set forth in the appropriate analytical methodology for: size of container, material of composition and preservative required. When necessary, the preservatives are measured and placed into the sample container. Chain of custody seals are included to insure complete sample integrity during shipment.

ETL includes Chain of Custody forms with each cooler. These are used as a record of the sampling and account for the samples at all times. The Chain of Custody documents track the analytical results back to the sampling event.

## IE. PROJECT MANAGEMENT

### 1. Program Definition/Project Management

ETL strives for the highest quality of service available. Projects are handled in a dual level fashion. A project manager initially reviews and defines the sampling event that is going to take place. The reviewer takes into account the regulatory needs and designs an analytical scheme to meet the required goals. This information is then passed to the technical management. This group defines and establishes the final details of the project. The technical group is responsible for the successful implementation of the plan. This group follows the project from the initial design to the final submittal of the report to the client.

ETL has a highly qualified group that handles project management. Their responsibilities are:

a. Defining data quality objectives
b. Assisting the client in identifying the analytical methodologies
c. Regulatory requirement clarification
d. Coordinating sampling between field and laboratory
e. Providing guidelines to clients on quality assurance, methodology and planning
f. Scheduling project to insure all requirements for timing are met
g. Interpreting data as per regulations, i.e. RCRA, CWA

## IF. TECHNICAL SUPPORT

ETL has a staff of highly trained environmental professionals who can provide sound direction in environmental work effort. Our staff is always available to help clients on their projects.

ETL and its affiliates have a wide variety of resources to draw upon. Our long history of client satisfaction has awarded us a reputation of thoroughness and excellence throughout the industry.

## IG. DATA VALIDATION/COURT ROOM TESTIMONY

The data at ETL is put through stringent quality assurance review to meet the respective regulatory guidelines. This data produced has the potential of being used for legal defense with the laboratory producing the data responsible for its accuracy and authenticity.

ETL has a capable staff to provide court room testimony on the validity of data produced. ETL can also provide other valuable insight on a consulting basis.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

## Section 2

# QUALITY ASSURANCE PROGRAM

# IA. SAMPLE MANAGEMENT

Sampling plans and procedures address the problem of obtaining a representative sample from a particular site. Sample management procedures must ensure the integrity of this sample to the time of analysis. Proper type and preparation of sample containers and sampling equipment is necessary to avoid contamination, and proper preservation of samples is required to avoid changes in analytes. Access to sample storage must be limited to authorized personnel and final disposal of samples must conform to regulations to minimize impact on the environment and public health.

## A.1 Preparation of Sampling Equipment and Sample Containers

All containers and closures must be cleaned and prepared according to the analytical method specific requirements. When method specific requirements are not available, the following procedure shall be followed for samplers and sample containers.

1. Wash with soap and tap water.

2. Rinse with tap water.

3. If samples are to be analyzed for metals, rinse with 10% nitric acids solution.

4. Rinse with deionized water.

5. If samples are to be analyzed for organics, rinse with acetone and dry totally in air or nitrogen. (Omit this rinse for volatile organics analyses.)

After cleaning, samplers shall wrap in similarly cleaned aluminum foil until used in the field. Sample containers supplied to clients shall be shipped in custody sealed coolers.

## A.2 Sampling

Samples shall be taken in accordance with the Sampling Summary of Procedures and the site-specific sampling plan. The sample shall be preserved immediately as indicated by the table and, where applicable, shall be sealed with a custody seal. Sampling date, time, source and preservative shall be recorded on the sample label with water insoluble ink. All samples obtained from a given sampling event shall be placed in one or more coolers, and the latter shall be sealed with two custody seals each. Chain of Custody forms shall be filled out at the site and shall accompany he samples to the laboratory.

## A.3 Sample Log-In, Storage and Control

Upon arrival at the laboratory, all samples shall be turned over to the Sample Management Technician (SMT). The SMT shall check the condition of all seals and note any deficiencies on the Chain of Custody form before opening any coolers. The coolers shall then be opened and each sample shall be checked against the Chain of Custody form. Any deficiencies, such as missing or extra samples, breakage, broken seals, etc., shall be recorded on the Chain of Custody form before the SMT assumes responsibility for the samples.

The sampling event shall be assigned a serial job number by the SMT, and each sample shall be given a unique number affixed to the lower part and lid of the sample container. The samples shall then be assigned a location in a secured cold storage (4° C) facility), and this location shall be recorded in the Sample Location Log. During regular working hours, access to the sample storage areas shall be limited to the SMT; at all other times, access to the sample storage areas shall be limited to the Shift Supervisor. (All references to the SMT in the following paragraph shall also apply to the Shift Supervisor.)

Technicians needing samples for analysis shall inform the SMT, who will obtain the requested samples. The technician shall sign the Sample Sign-Out Log and, where applicable, the Chain of Custody form. Upon returning the samples to the SMT, the technician shall sign any applicable Chain of Custody forms and the SMT shall initial the Sample Sign-Out Log. If a sample is entirely consumed by an analysis, this shall be noted in the Sample Location Log. (Aqueous samples for semivolatile and/or pesticide analyses are normally consumed by the analytical method; this need not be recorded in the Sample Location Log.)

## A.4 Sample Disposal

Samples submitted shall be retained for 90 days after issuance of the analytical report unless otherwise provided for by special arrangement with the client. At the end of this period, innocuous samples shall be disposed of by ordinary means, except that aqueous samples shall be pH adjusted between 5.0 and 8.0 prior to disposal.

Whenever possible, liquid organic samples and samples for which one or more hazardous substance levels are exceeded shall be returned to the client or the site.

Hazardous samples that cannot be returned shall be composited in the appropriate group as follows:

- PCBs
- Halogenated Organics
- Nonhalogenated Organics
- Inorganics (exclusive of acids and bases)

Disposal of these wastes will be contracted to a certified hazardous waste hauler.

## A.5 APPROVED SAMPLE CONTAINERS AND PRESERVATION

| Parameter | Container | Preservative |
|---|---|---|
| Inorganic Chemistry | | |
| Acidity (as $CaCO_3$) | G or P | 1 |
| Alkalinity (as $CaCO_3$) | G or P | 1 |
| Ammonia (as N) | G or P | 1,2 |
| Biochemical Oxygen Demand ($BOD_5$) | G or P | 1 |
| Bromide | G or P | None |
| Chemical Oxygen Demand (COD) | G or P | 1,2 |
| Chloride | G or P | None |
| Chlorine, total residual | G or P | None |
| Chromium, hexavalent | G or P | 1 |
| Color | G or P | 1 |
| Cyanide | G or P | 1,5,7 |
| Fluoride | P | None |
| Hardness, total (as $CaCO_3$) | G or P | 2 or 3 |
| Hydrogen Ion (pH) | G or P | None |
| Kjeldahl Nitrogen, total (as N) | G or P | 1,2 |
| Metals | G or P | 3 |
| Nitrate (as N) | G or P | 1 |
| Nitrite (as N) | G | 1 |
| Odor | G | 1 |
| Oil and Grease | G | 1,4 |
| Organic Carbon, total (TOC) | G or P | 1,2 |
| Organic Halogens, total (TOX) | Z | None |
| Orthophosphate (as P) | G or P | 1,9 |
| Oxygen, dissolved, probe method | G* | None |
| Petroleum Hydrocarbons, total | G | 1,4 |
| Phenolics, total | G | 1,2 |
| Phosphorus, total | G or P | 1,2 |
| Residue | G or P | 1 |
| Silica | P | 1 |
| Specific Conductance | G or P | 1 |
| Sulfate (as $SO_4$) | G or P | 1 |
| Sulfide (as S) | G or P | 1,8 |
| Sulfite (as $SO_3$) | G or P | None |
| Surfactants (MBAS) | G or P | 1 |
| Turbidity | G or P | 1 |

| Parameter | Container | Preservative |
|---|---|---|
| **Organic Chemistry** | | |
| Volatile Organics | V | 1 |
| All other organics | T | 1 |

**Containers**

| | |
|---|---|
| G | Glass |
| G* | Glass with glass stopper |
| P | Polyethylene |
| T | Glass with Teflon-lined cap |
| V | 40-ml glass vial with Teflon-lined septum |
| Z | Zero-headspace glass with Teflon-lined septum |

**Preservatives**

| | |
|---|---|
| 1 | Cool to 4° C |
| 2 | pH <2 with concentrated sulfuric acid |
| 3 | pH <2 with concentrated nitric acid |
| 4 | pH <2 with concentrated hydrochloric acid |
| 5 | pH >2 with 10N sodium hydroxide |
| 6 | 0.008% sodium thiosulfate (in presence of residual chlorine only) |
| 7 | 0.04% ascorbic acid (in presence of residual chlorine only) |
| 8 | 2 mL of 2N zinc acetate adjusted to pH >9 with sodium hydroxide |
| 9 | Filter immediately |

## IIB. MANAGEMENT OF SUPPLIES

The production of good quality data is dependent upon many things. One of the most critical areas is the specification of the chemical standards and reagents used. In addition, an area that is commonly overlooked is glassware. While correct selection and use of these items does not guarantee a good analysis, it is virtually certain that accurate data will not be obtained without using quality standards, reagents, and glassware. Therefore, certain procedures and practices must be followed in the procurement and use of these items.

### B.1 Procurement

Generally, chemical reagents, gases and solvents are available from several manufacturers in up to six grades: technical grade, practical grade, chemically pure, USP grade, analyzed and primary standard grade. For use in analyses where parts-per-million detection or lower is required, the first three grades of material shall be avoided unless one of the other grades is unavailable. The acceptable grades are as follows:

- USP: These are reference standards supplied with purity data. While these materials may be used for chemical analysis, they are not to be used to prepare working standards.

- Analyzed: This class may also be labeled as "reagent grade" or "ACS grade," and conforms to the specifications set forth by the Committee on Analytical Reagents of the American Chemical Society. Each lot of material is individually analyzed by the manufacturer. The material must meet or exceed the specifications listed on the bottle.

- Primary Standard: This is the purest form of reagent available. Each lot is analyzed by the manufacturer, and its purity certified on the bottle. This grade of material shall be utilized to make laboratory working standards, and shall be traceable to EPA standards.

All reagents shall be purchased in the grade specified by the analytical method. Additionally, reagents shall be purchased in proper containers as determined by the use to which they will be put (e.g., reagents for organic preparations should never be purchased in plastic bottles). All bottles or cans must be received tightly closed with the original label firmly affixed. Container sizes should be selected so that they will be consumed rapidly after opening. The month and year of receipt shall be clearly marked on the label, and stock shall be used on a first-in-first-out basis. Containers shall be stored in an appropriate place: solvents in vented solvent cabinets, acids in acid storage cabinets, and other reagents on shelves in the laboratory. Incompatible materials must be kept segregated. Storage of reagents above eye level is prohibited.

### B.2 Standards

If possible, all standards shall be prepared from "primary standard" materials, and shall be traceable to EPA reference materials. Primary reference standards are available from a number of sources: The National Institute of Standard Technology (NIST), The American Society for Testing and Materials (ASTM), and the Environmental Protection Agency (EPA) pesticide repository, as well as numerous commercial suppliers. Primary reference standards are used to calibrate instruments as well as to assay secondary or "working" standards. Therefore, they must be treated with extreme care to avoid contamination and/or decomposition.

All primary reference standards, regardless of source, shall be dated when received and stored in such a way as to prevent deterioration (i.e., refrigerated, desiccated, etc.). These materials shall be used within six months or prior to the expiration date, if longer. Any material remaining after this date must be discarded in accordance with the procedures for disposal of hazardous samples. If a primary reference standard or other material is to be used for preparation of a secondary or working standard, the following procedures must be followed:

- The working standard shall be placed in an appropriate container.
- The standard shall be labeled with solute, concentration, solvent, name of preparer, notebook and page references, date prepared, expiration date and required storage conditions.
- The preparation of the standard shall be documented in a laboratory notebook with name of solute, manufacturer, catalog number, lot number, purity, tare weight, gross weight, net weight, net weight corrected for purity (if purity is <95%), solvent, final volume and concentration.
- All old working standards shall be discarded before the new standard is put in storage.

Working standards shall be discarded on or before the expiration date, or sooner if laboratory studies indicate that degradation has occurred. In no case shall a working standard be kept longer than six months.

## B.3 Reagents

Each type of analysis has its own requirements for grade of reagents used. This is mainly due either to instrumentation or to level of detection required for trace analyses. All analyses are to be considered trace level, and reagents shall be purchased accordingly. The types of analyses performed and their requirements are as follows.

1. GC Analyses: The minimum acceptable grade for pesticides and PCB analyses is pesticide grade. Analyses performed by flame ionization detector require ACS grade reagents at a minimum. Certain analyses may require that high grades of material be used, but this is to be considered on a case-by-case basis.

2. GC/MS Analyses: Due to the normal performance of NBS searches in the GC/MS run, it is necessary that all reagents used be of the highest purity so as not to introduce impurity peaks into the chromatograms. Therefore, solvents of the highest purity level, and reagents of ACS or primary standard grade shall be used.

3. General Inorganic Analyses: Each analysis performed may have special requirements for quality of reagent used. In general, however, ACS analytical reagent grade chemicals are satisfactory for this work.

4. Trace Metal Analyses: In general, ACS analytical reagent grade chemicals are satisfactory for this work. However, if possible, spectro-quality reagents shall be used. In wither case, the specifications for these reagents need to be closely checked to ensure that their metal content is below the necessary detection limits for the analysis.

## B.4 Gases

Numerous gases are used for laboratory operation. Gases such as compressed air, which are used to operate a mechanical apparatus (e.g., door opening solenoids), may be of any available grade. Gases which are used as carrier or reagent gases for chromatography equipment, flame or plasma gases for AA/ICP, or gases which somehow come into direct contact with samples or sample preparations, shall be of the highest purity, typically "zero" grade. All cylinders, no matter what their use, shall be connected to water filters to prevent condensation in the gas lines. Gases used for GC and GC/MS instruments as well as organic sample preparation shall pass through an oxygen removal filter, a hydrocarbon trap and a particle filter before coming in contact with any equipment, samples, or sample digestions or extracts.

Gas cylinders shall be removed from service when the internal pressure reaches approximately 50 psi in order to prevent the entry of air into the system. Empty cylinders should be marked clearly as being empty.

B.5 Glassware

In general, the published analytical methods specify the types of glassware to be used for storage of standards and extracts. Guidelines are as follows if the glassware is not specified:

- Standard solutions of silica, boron, and the alkali metals shall be stored in polyethylene bottles.
- Standard solutions and reagents for inorganic analyses shall be stored in borosilicate or polyethylene bottles except as stated above.
- Dilute metal standards shall not be stored since they tend to plate out upon standing. These solutions shall be prepared as needed, then discarded.
- For certain analyses, the use of disposable containers for storage of extracts is acceptable. This is especially true when using containers such as autosampler vials.

For use in analysis, measuring equipment is regularly used, such as pipettes, burettes, graduated cylinders, volumetric flasks, etc. For rough measurement of volumes, it is permissible to use less accurate glassware such as graduated cylinders. However, when preparing standard solutions or measuring samples, Class A glassware shall be used. All Class A glassware that is damaged in any way shall be immediately discarded. In the event that an analytical method requires that Class A glassware be used for a particular application, the technician performing the test will comply with the specifications.

Clean glassware is the first requirement in the performance of a quality analysis. Attention to the cleanliness of glassware is of extreme importance and each analytical method specifies the cleaning methods to be used. Glassware shall be cleaned with soap and water and rinsed with tap water and deionized water by the laboratory glassware washer. It is the analyst's responsibility however, to ensure that the proper reagent and/or solvent rinses are performed on all glassware before beginning the analysis.

B.6 Control

It is the responsibility of each analyst to notify his or her supervisor when supplies run low or when contaminated supplies are suspected. All new lots of reagents and solvents shall be tested by the analyst for purity before use, and any irregularities shall immediately be brought to the attention of the Section Supervisor or Quality Assurance Manager. Reagents shall be used by pouring the required amount of material into a clean beaker or flask, and then returning the stock bottle to storage. At no time shall any excess material be poured back into the stock bottle, nor shall any implements (e.g., pipettes, spatulas, etc.) be placed into the stock bottle for withdrawal of material. If this happens, the bottle shall be discarded immediately.

## IIC. QUALITY CONTROL SAMPLE ANALYSIS

Quality control (QC) analyses are essential for continual assessment of analytical procedures. QC analyses include blanks, check standards, matrix spikes, matrix spike duplicates, blind QC samples and double blind QC samples.

Matrix blanks shall be prepared in the same manner as samples and shall be analyzed at a minimum frequency of once per day or once per batch, whichever is more frequent.

Check standards shall be run at the level and frequency specified in the analytical method used. Where the level is not specified by the analytical method, the level shall be equal to the mid-range of the standard curve or five times the minimum detection limit, whichever is lower. Where the frequency is not specified by the analytical method, the frequency shall be 10% of the samples analyzed, including blanks and spikes, or once every twelve hours, whichever is more frequent. In all cases a check standard should be the last analysis performed in a given analytical session.

A laboratory control standard is a check standard that must be prepared in the same manner as samples. It shall be run at the level and frequency specified by the analytical method. Control limits are specified in each method of analysis.

Matrix spikes and matrix spike duplicates shall be prepared at the level and frequency specified in the analytical method used. Where the level is not specified by the analytical method, the level shall be five times the minimum detection limit. Where the frequency is not specified by the analytical method, the frequency shall be 10% of the samples analyzed, exclusive of blanks and standards.

Blind QC samples containing analytes of importance to environmental analyses shall be prepared and submitted by the Quality Assurance Manager on a monthly basis.

Double blind QC samples containing any analytes for which is qualified to analyze shall be submitted by the Quality Assurance Manager at least four times annually on an irregular basis.

Quarterly control limits shall be calculated from the most recent 25 pairs of matrix spike duplicates. Upper and lower control limits for spike recoveries (a measure of accuracy) shall be calculated as the mean recovery plus and minus three times the standard deviation of the recoveries:

$\bar{X} = X_i / n$

$s = ( (X_i - \bar{X})^2/(n-1))^{1/2}$

$UCL = \bar{X} + 3s$

$LCL = \bar{X} - 3s$, where $3s \leq \bar{X}$

$= 0$ , where $3s > \bar{X}$

$\bar{X}$ = mean recovery

$X_i$ = individual matrix spike recoveries

n = number of spikes (normally 50)

s = standard deviation of spike recoveries

UCL = upper control limit

LCL = lower control limit

Maximum relative percent differences (a measure of precision) shall be calculated as three times the standard deviation of the absolute values of the relative percent differences:

$RPD = 100 (X_{MS} - X_{MSD})^2/((X_{MS} + X_{MSD})/2)$

$\overline{RPD} = RPD/n$

$s = ( ( |RPD| - \overline{RPD})/(n-1))^{1/2}$

$MRPD = 3s$

RPD = relative percent difference

$\overline{RPD}$ = mean relative percent difference

$X_{MS}$ = matrix spike recovery

$X_{MSD}$ = matrix spike duplicate recovery

s = standard deviation of the absolute values of RPD

n = number of matrix spike and matrix spike duplicate pairs

MRPD = maximum relative percent difference

In the event that insufficient data is available to calculate control limits for a particular parameter, the method specified precision and accuracy statement shall be used to calculate control limits. Where the method does not include a precision and accuracy statement, the following values shall be used:

| Analysis | Recovery Range | Maximum RPD |
|---|---|---|
| Volatile Organics | 70-130 | 30 |
| Base/Neutral Extractables | 40-120 | 30 |
| Acid Extractables | 40-120 | 30 |
| PCBs and Pesticides | 70-120 | 30 |
| Inorganics | 75-125 | 20 |

When the amount of spike is less than 20% of the total amount of analyte found in a spiked sample, recovery data shall be disregarded.

Where contractual requirements differ from the standards set in this section, the contractual requirements shall prevail.

## IID. QUALITY ASSURANCE - ORGANICS

D.1 Discussion:

The Organic Laboratory Operations encompasses the following individual groups:

1- Extractions
2- Gas-Chromatography, Volatiles
3- Gas-Chromatography, Semi-volatiles
4- Gas-Chromatography/Mass-Spectrometry, Volatiles
5- Gas-Chromatography/Mass-Spectrometry, Semi-volatiles.

Each laboratory group is involved either in part or whole for the performance of EPA specified methodologies. This is accomplished through the implementation of standard operating procedures, oversight by the supervisors, quality assurance officer, laboratory manager, and laboratory director. Additional analyst experience is gained through company sponsored training programs.

D.2 Overview

a. **Extractions:**
ETL uses EPA specified sample preparation techniques for Pesticides, PCBs, Herbicides, Base-Neutral and Acid-Extractables. Every sample is spiked with one or more surrogates to measure extraction efficiency, with the implementation of corrective action as required. For every batch of 10 to 20 samples one matrix spike and matrix spike duplicate is performed. In some instances matrix spikes are performed more frequently (Project/Client Specific)

b. **Volatiles, Purge & Trap:**
Volatiles are purged using Tekmar P&T, and analyzed either by GC-Hall/PID or GC/MS. ETL utilizes the internal standard quantitation technique, with surrogates as a measure of purging efficiency. Surrogate recovery are plotted daily, and measured against every run to isolate statistical outliers. These samples are then re-scheduled for analysis.

D.3 Gas-Chromatography

a. **Calibration**
A Minimum of five calibration standards containing the method analytes are analyzed to establish instrument/system calibration. The initial calibration concentrations define the working range of the GC system, with the low level, at or near the method detection limit. One calibration check standard must be done for every ten samples with a minimum allowable %RSD of 30. When the %RSD exceeds 30, the analysis is immediately stopped and the system checked for malfunctions. Once corrected, the check standard is re-analyzed prior to the analysis of any samples.

b. **Matrix-Spike/Matrik-Spike Duplicate (MS/MSD)**
With every batch of 10 to 20 samples one MS and MSD is analyzed to monitor and plot analyte recoveries in individual matrices.

c. **Laboratory Control Samples (LCS)**
LCS are used to verify the quality of the check standard and laboratory continued performance. Calibration standard materials and LCS are purchased from different manufacturers, with the materials always from a National Institute of Standard Technology (NIST) source. The laboratory control sample must meet 75-120 % recovery from the calibration check standard or initial calibration.

D.4 Gas-Chromatography/Mass-Spectrometry

a. **Tune**
Prior to the analysis of blanks, standards or samples the instrument must be tuned to meet either BFB, or DFTPP criteria. Only when acceptable criteria for the individual ions is met can the analyst proceed to establish system calibration. Every 12 hours the Tune standard must be analyzed, and only when it meets criteria can the analysis proceed.

b. **Quantitation**
A minimum of five calibration standards containing the method analytes is used to establish system calibration. The initial calibration concentration levels should define the working range of the GC/MS system, with the low level standard near the method detection limit.
Before the initial calibration can be used, system performance and calibration check criteria must be met. These are established in the individual methodologies, and found in the standard operating procedures.

If the percent relative deviation of an analyte in the initial calibration is less than 35% in the continuing calibration, the system is in control and the analysis can proceed. The state of the calibration must be checked every 12 hours.

# IIE. QUALITY ASSURANCE - INORGANICS

## E.1 Discussion for Graphite Furnace Analysis

Samples are analyzed using the Perkin-Elmer Zeeman 5100. The furnace is calibrated with five (5) standards. Our Quality Control measures which are followed are listed below:

## E.2 Overview

a. **Calibration Verification:**
At a frequency of 10%, a calibration verification standard is analyzed to assure accuracy. If the percent recovery is not within 85-115%, the analysis is terminated, the instrument recalibrated, and samples reanalyzed.

b. **Calibration Blank:**
A calibration blank is analyzed immediately following the calibration verifications. If the value is greater than the method detection limit, the analysis is terminated, corrective action taken, the instrument recalibrated and samples reanalyzed.

c. **Laboratory Control Standard:**
A Laboratory control Standard (LCS) is a known standard solution that is treated like a regular sample. The LCS is digested once with every digestion run. The percent recovery must be within 80-120% with the exception of Ag and Sb. If recovery falls outside these limits, all samples associated with that digestion run must be redigested.

d. **Preparation Blank:**
A preparation blank consists of laboratory grade water which is digested and analyzed as if it were a sample. The absolute value of the prep blank must be less than or equal to the method detection limit. Otherwise, all samples associated with this digested blank must be redigested and reanalyzed.

e. **Duplicate Analysis:**
A duplicate analysis is performed on each group of 10 samples of similar matrix. A control limit of 20% RPD shall be used for sample values >5 times of ± the detection limit shall be used for sample values <5 times the detection limit. If this criteria is not met, it is noted in a Case Narrative.

f. **Matrix Spike Analysis**
A matrix spike analysis consists of a known amount of an analyte being added into a sample prior to digestion. A matrix spike is performed on each group of 10 samples of similar matrix. Spike recovery limits are 75-125%. If this criteria is not met, a post-digested spike is analyzed to determine matrix interference - If neither criteria is met, it is noted in a case narrative.

g. **General Graphite Furnace Quality Control**
All graphite furnace analysis requires replicate analysis. The average of the replicates is reported. If the percent RPD is greater than 20%, the samples must be rerun.

All samples require post digestion spikes. The recovery of the spikes must be within 85-115% or the samples must be rerun. If the criteria is still not met, the sample must be analyzed by Method of Standard Addition.

## IIF. QUALITY ASSURANCE - INORGANIC

### F.1 Discussion of ICP Analysis

Samples are analyzed using the Leeman PS1000 ICP. The ICP is calibrated per manufacturers specifications using two standards. Our quality control measures which are followed are listed below:

### F.2 Overview

a. **Calibration Verification:**
At a frequency of 10%, a calibration verification is analyzed to assure accuracy. If the percent recovery is not within 90-110%, the analysis is terminated, the instrument recalibrated, and samples reanalyzed.

b. **Calibration Blank:**
A calibration blank is analyzed immediately following the calibration verifications. If the value is greater than the method detection limit, the analysis is terminated, corrective action taken, the instrument recalibrated and samples reanalyzed.

c. **Laboratory Control Standard:**
A Laboratory Control Standard (LCS) is a known standard solution that is treated like a regular sample. The LCS is digested once with every digestion run. The percent recovery must be within 80-120% with the exception of Ag and Sb. If recovery falls outside these limits, all samples associated with that digestion run must be redigested.

d. Preparation Blank:

A preparation blank consists of laboratory grade water which is digested and analyzed as if it were a sample. The absolute value of the prep blank must be less than or equal to the method detection limit. Otherwise, all samples associated with this digested blank must be redigested and reanalyzed.

e. Duplicate Analysis

One duplicate is analyzed from each group of samples of similar matrix type and concentration. A control limit of 20% for relative percent difference (RPD) shall be used for original and duplicate sample values greater than or equal to 5 times the CRDL. A control limit of ± the CRDL must be used for sample values less than the CRDL.

RPD is calculated as follows:

$$RPD = \frac{1s - D1}{(S+D)/2} \times 100$$

Where S = First Sample Value (Original)
D = Second Sample Volume (Duplicate)

f. Spike Sample Analysis

The spike sample analysis will provide information about the effect of the sample matrix on the recovery of the analytes. A known amount of spike is added prior to the digestion of the sample. A spike is performed on each matrix type and each concentration range. The spiking levels are determined by various analytical services protocols. If the spike recovery is not within the limits of 75-125%, all samples associated with this sample spike must be flagged. An exception to this rule is granted where the sample concentration exceeds the spike concentration by a factor of four or more. If this should occur, the data shall be reported unflagged even if the percent recovery falls outside the 75-125% limits.

For ICP analyses, when the pre-digestion spike recovery falls outside the 75-125% control limits, and the sample result does not exceed 4 times the spike added, a post-digestion spike must be performed for all elements that do not meet specified criteria (except Ag). The sample must be spiked with a level of 2 times the CRDL.

If the percent recovery falls outside the limits, the data is flagged and it is noted in a case narrative.

g. General ICP Quality Control

ICP Interference Check Sample (ICSA & ICSAB)

At the beginning and end of each analytical run, an ICSA & ICSAB must be run. The control limits are 80-120%. If the result falls outside these control limits, analysis is terminated and corrective action taken.

ICP Serial Dilution

One sample from each analytical group of similar matrix and concentration must undergo a serial dilution. A serial dilution determines if the sample matrix is causing physical or chemical interferences. The sample is diluted 1:5 and analyzed with a regular analytical run. If the analyte concentration is a factor of 10 above the IDL after dilution, the analysis of the dilution must agree within 10% of the original result. If the result is not within 10%, a chemical or physical interference effect should be suspected.

## IIG. INTERNAL POLICY

### 1. Statement of Policy

ETL has and will continue to strive for the highest quality to meet or exceed those standards put forth in the regulatory environmental laboratory industry. ETL's objective is to produce data of the highest quality so our client can make their decisions based on accurate data.

ETL's Quality Assurance Plan consists of policies that create a uniform structure under which data is generated with accuracy and precision. This plan was put into place by senior staff members and is reviewed routinely to insure up-to-date status of any regulatory or technical changes.

The quality assurance staff consists of highly qualified and trained members. They have experience in the areas they are reviewing and are kept informed of all regulatory changes. The QA plan is incorporated into the daily operations of the laboratory. The QA staff has direct access to the senior manager of the laboratory. With data generated from the QA staff, the operations management can determine that the data meets regulatory requirements.

Personnel are required to follow all QA/QC criteria. Operational criteria and methodology must be followed and met before any result is considered completed. To minimize equipment error and down time, preventive maintenance programs are followed.

QA/QC procedures begin at the delivery of the sample and follow through the completion of the technical report. Hard copy data is maintained during the entire process.

## 2. Performance Audits

ETL has and will continue in a number of external performance audits by clients as well as federal and state regulatory agencies. An audit can consist of inspection and review of data generated, quality control and the infrastructure of the laboratory. These reviews include all areas of QA/QC and record keeping. They may also include samples which track the quantitative ability of the facility.

ETL QA plan includes internal audits which are conducted to inspect all areas to insure compliance with the plan.

Managers are responsible for implementing any corrective actions brought forth in these audits.

## 3. Certification

ETL holds laboratory certification in a number of states. Many of these require the analysis of proficiency samples on a routine basis. A list of certifications held is found in the appendix.

## 4. Chain of Custody

The Chain of Custody forms are the paper trail of a sample from its inception to its final disposition.

The EPA (NEIC) defines custody as follows:

a. It is in your actual possession; or
b. It is in a secure area; or
c. It is in your view, after being in your physical possession; or
d. It was in your possession and then you locked or sealed it to prevent tampering.

ETL's Chain of Custody begins when the sample containers are being prepared. ETL has a three page Chain of Custody that conforms with state and federal requirements.

This record shows the following types of information:

a. The person with custody.
b. Time and date each person accepted/relinquished custody.
c. Sample location and analysis required.

To insure security throughout the system, ETL uses the following procedure:

a. Access to laboratory is through a monitored reception area.
b. Visitors sign in at the reception area and are escorted in the laboratory.
c. Only designated sample custodian and supervisory personnel have access to sample storage area.
d. All sample transfers are documented into and out of storage.
e. Samples remain in storage area when not needed.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 Fax: 516-249-8344 · Phone: 516-249-1456

# IIH. EQUIPMENT

| Instrument | Manufacturer | Number |
|---|---|---|
| GC/Mass Spectrometer (GC/MS) | Hewlett Packard | 5 |
| GC/FID | Varian/Tracor | 3 |
| GC/ECD | Tracor | 1 |
| GC/PID-HALL | Varian/Tracor | 2 |
| GC/PID | HNU | 1 |
| TCLP Extractors | | 3 (8-12 position) |
| Inductive Coupled Plasma | Leeman | 1 |
| Atomic Absorption (Furnace) | Perkin-Elmer | 1 |
| Atomic Absorption (Flame) | Varian | 1 |
| Infrared Spectrometer (IR) | Buck | 1 |
| Ultraviolet/Visible Spectrometer (UV/VIS) | Bausch & Lomb | 1 |
| Transmission Electron Microscope | JOEL 100cx | 1 |
| Microscopes (PLM, PCM) | Nikkon | 3 |

And numerous apparatus for conventional or "wet" chemistry procedures.

## 1. INSTRUMENTATION CONFIGURATION

### a. Organic Analysis

**Hewlett Packard 5970B MSD GC/MS**
*Volatiles*

**Hewlett Packard 5970B MSD GC/MS**
*Semi-Volatiles*

**Tracor 540**
- Photoionization Detector(PID) - Electolytic Conductivity Detector (HALL)
- Envirochem Concentrator- Liquid, Soil & Air sample introduction
- Tekmar Autosampler
- PE/Nelson Data acquisition and analysis

*Volatile Organic Aromatics & Halogenated Compounds*

**Tracor 540**
- Flame Ionization Detector
- PE/Nelson Data acquisition and analysis

*Petroleum Product Identification*

**Tracor 540**
- Electron Capture Detector
- PE/Nelson Data acquisition and analysis

*PCBs,*

**Tracor 540**
- Flame Ionization Detector
- PE/Nelson Data acquisition and analysis

*Polynuclear Aromatic Hydrocarbons*

**Tracor 540**
- Electron Capture Detector
- PE/Nelson Data acquisition and analysis

*Pesticides & Herbicides*

**Varian 3400**
- Photoionization Detector(PID) - Electolytic Conductivity Detector (HALL)
- Tekmar Concentrator - Liquid & Soils
- Tekmar Autosampler
- PE/Nelson Data acquisition and analysis

*Volatile Organic Aromatics & Halogenated Compounds*

Instrumentation - cont:

Varian 3400
- Flame Ionization Detector
- PE/Nelson Data acquisition and analysis

*Volatile Organic Compound Screening*

**HNu Portable Field GC-311**
- Photoionization Detector(PID)
- PE/Nelson Data acquisition and analysis

*Volatile Organic Compound Screening*

**DELL 386 Central Data Acquisition Work Station**

*Data Analysis and Reporting*

**Hewlett Packard A-Series Micro Computer**

*Data Analysis and Reporting*

**Apple Macintosh Mac II , CX, SE Network**

*Sampling Tracking, Data Management & Reporting*

b. **Inorganic and General Analysis**

**Leeman Laboratory ICP 1000**
- Microprocessor Control for Data Reporting

*Metals Analysis*

**Perkin Elmer 5100 PC Zeeman Furnace Atomic Absorption**
- TCLP required for metals
- 386 pc based Data Reporting

*Metals Analysis*

**Varian Spec 20 Furnace Atomic Absorption**
- Microprocessor Control for Data Reporting

*Metals Analysis*

**Varian Spec 20 Atomic Absorption**
- Hydride Generator
- Microprocessor Control for Data Reporting

*Metals Analysis*

**Penski Martin Flash Point Apparatus**

*Ignitability*

**pH Meter**

*pH Measurement*

Instrumentation - cont.

Conductivity Meter
*Conductance Measurements*

Spectrophotometer
*Colorimetric Determinations*

Titrators
*End Point Determinations*

Asbestos Analysis

JEOL 100CX Transmission Electron Microscope (TEM)
Kevex EDS attachment
Digital PDP-11 computer control

Nikon Labophot - POL Polarizing Microscopes

Nikon Labophot - 2 Phase Contrast Microscope

Air Sampling Equipment

Personnel Air Monitoring Equipment

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 Phone: 516-249-1456

# III. DISPOSAL REQUIREMENTS

| Category | EPA Waste # | Compound | Solid Waste Method | Holding Time | M.C.L. (mg/l) |
|---|---|---|---|---|---|
| Metals | D0004 | Arsenic | SW-846, 7000 | 6 months | 5.00 |
| Metals | D005 | Barium | SW-846, 7000 | 6 months | 100.00 |
| Metals | D007 | Chromium | SW-846, 7000 | 6 months | 5.00 |
| Metals | D006 | Cadmium | SW-846, 7000 | 6 months | 1.00 |
| Metals | D008 | Lead | SW-846, 7000 | 6 months | 5.00 |
| Metals | D009 | Mercury | SW-846, 7000 | 28 days | 0.20 |
| Metals | D010 | Selenium | SW-846, 7000 | 6 months | 1.00 |
| Metals | D011 | Silver | SW-846, 7000 | 6 months | 5.00 |
| Pesticide | D012 | Endrin | SW-846, 8080 | 7/40 days | 0.02 |
| Pesticide | D013 | Lindane | SW-846, 8080 | 7/40 days | 0.40 |
| Pesticide | D014 | Methoxychlor | SW-846, 8080 | 7/40 days | 10.00 |
| Pesticide | D015 | Toxaphene | SW-846, 8080 | 7/40 days | 0.50 |
| Herbicide | D016 | 2,4-D | SW-846, 8150 | 7/40 days | 10.00 |
| Herbicide | D017 | 2,4,5-TP | SW-846, 8150 | 7/40 days | 1.00 |
| Volatiles | D018 | Benzene | SW-846, 8020 | 14 days | 0.50 |
| Volatiles | D019 | Carbon Tetrachloride | SW-846, 8010 | 14 days | 0.50 |
| Pesticide | D020 | Chlordane | SW-846, 8080 | 7/40 days | 0.03 |
| Volatiles | D021 | Chlorobenzene | SW-846, 8240 | 14 days | 100.00 |
| Volatiles | D022 | Chloroform | SW-846, 8240 | 14 days | 6.00 |
| Volatiles | D023 | o-Cresol | SW-846, 8240 | 14 days | 200.00 |
| Volatiles | D024 | m-Cresol | SW-846, 8240 | 14 days | 200.00 |
| Volatiles | D025 | p-Cresol | SW-846, 8240 | 14 days | 200.00 |
| Volatiles | D026 | Cresol | SW-846, 8240 | 14 days | 200.00 |
| Semi-volatiles | D027 | 1,4-Dichlorobenzene | SW-846, 8250 | 7/40 days | 7.50 |
| Volatiles | D028 | 1,2-Dichloroethane | SW-846, 8240 | 14 days | 0.50 |
| Volatiles | D029 | 1,1-Dichloroethylene | SW-846, 8240 | 14 days | 0.70 |
| Semi-volatiles | D030 | 2,4-Dinitrotoluene | SW-846, 8250 | 7/40 days | 0.13 |
| Pesticide | D031 | Heptachlor | SW-846, 8080 | 7/40 days | 0.008 |
| Semi-volatiles | D032 | Hexachlorobenzene | SW-846, 8250 | 7/40 days | 0.13 |
| Semi-volatiles | D033 | Hexachloro-1,3-butadiene | SW-846, 8250 | 7/40 days | 0.50 |
| Semi-volatiles | D034 | Hexachloroethane | SW-846, 8250 | 7/40 days | 3.00 |
| Volatiles | D035 | Methyl ethyl Ketone | SW-846, 8240 | 14 days | 200.00 |
| Semi-volatiles | D036 | Nitrobenzene | SW-846, 8250 | 7/40 days | 2.00 |
| Semi-volatiles | D037 | Pentachlorophenol | SW-846, 8250 | 7/40 days | 100.00 |
| Semi-volaitles | D038 | Pyridine | SW-846, 8250 | 7/40 days | 5.00 |
| Volatiles | D039 | Tetrachloroethylene | SW-846, 8240 | 14 days | 0.70 |
| Volatiles | D040 | Trichloroethylene | SW-846, 8240 | 14 days | 0.50 |
| Semi-volatiles | D041 | 2,4,5-Trichlorophenol | SW-846, 8250 | 7/40 days | 400.00 |
| Semi-volatiles | D042 | 2,4,6-Trichlorophenol | SW-846, 8250 | 7/40 days | 2.00 |
| Volatiles | D043 | Vinyl Chloride | SW-846, 8240 | 14 days | 0.20 |

# IIJ. KEY PERSONNEL

# Environmental Testing Laboratories, Inc.

208 Route 109 Farmingdale, NY 11735 Fax: 516-249-8344 Phone 516-249-1456


**Laboratory Director**- Daniel J. Spandau

## EDUCATION

MBA degree in Management Information Systems.
New York Institute of Technology
36 credits Related Coursework : Information Resource Management, Data-Base Management Systems, Systems Analysis and Design, Personnel Management

Graduate Level Courses:
Laboratory Management Pittsburgh, PA..1987
Computer Interface of Laboratory Instrumentation. RPI, Troy, N.Y. 1985
Aerosol Dispersion and Meas. Univ. of Minn, Minneapolis, MN 1983

Bachelors Degree, SUNY Oneonta, 1977

## SUMMARY OF EXPERIENCES

**Environmental Testing Laboratories, Inc.**, Farmingdale, N.Y. 11735
Laboratory Director September, 1988 to Present
Responsible for overseeing the day to day operation of a commercial, New York State certified analytical testing laboratory. Implementation, and maintenance of required QA/QC procedures specified by NYSDOH, NYDEC and EPA.

**Brookhaven National Laboratory**, Upton, N.Y. 11973
Chemistry Associate II 1984 to September, 1988
Responsibilities include management and supervision of the analytical laboratory of the Environmental Chemistry Division, Tracer Technology Center. Designed and implemented laboratory information management system, which includes data acquisition to data reporting. Responsibilities included the analysis and supervision of three Gas Chromatographs for the analysis of fluorinated organic compounds. Designed and setup a central computing facility with a local area network and links to VAX and IBM mainframe computers for the Environmental Chemistry Division.

Chemistry Associate III 1982 to 1984
Operated a HP 5985A GC Mass Spectrometer for 2 years. Designed a multi-user mobile field measurement facility, for use in ambient air monitoring. Designed a Circular Dicroism/Vacuum UV Spectrometer that is being used in experimental research at the National Synchrotron Light Source. Participated in the design and development of a Chemiluminescent detector for a GC used for the detection of reduced sulfur compounds.

Chemistry Associate IV 1977 to 1981
Development and/or modification of various instrumental and wet chemical techniques to determine trace inorganic and organic pollutants. Use of aerosol dispersion and measurement techniques. Used a wide variety of laboratory instrumentation, which include Atomic Absorption, Ion Chromatography, Technicon Auto Analyzer Colorimetric techniques and more.

## RESEARCH AND PROFESSIONAL INTERESTS

**Laboratory information management** - instrument interface, QA/QC to data reporting.
**American Chemical Society**- Analytical Chemistry
**Delta Mu Delta**- Business management honors society
**National Well Water Association**- Assoc. of Ground Water Scientists and Engineers

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**Asbestos Supervisor** - Edward Detweiler

## EDUCATION

Bachelor Degree, Physics: Major in Geology, SUNY Cortland, 1987

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories, Inc., Farmingdale, NY
1/90 - Present
Asbestos Supervisor

Laboratory Testing Services, Westbury, New York 9/87 - 12/89
TEM Operator

## CERTIFICATIONS/REGISTRATIONS

New York State Asbestos Handler, No. AH88-09139
AHERA Inspector, No. 8910/03/093, Institute of Asbestos Awareness
AHERA Management Planner, No. 8910/04/058, Institute of Asbestos Awareness
New Jersey Asbestos Safety Technician, No. 0418

## TRAINING CERTIFICATES

Asbestos Abatement Investigator
Asbestos Training Academy
Sampling and Evaluating Airborne Dust, NIOSH 582
University of Medicine and Dentistry of New Jersey
JEOL TEM Operation and Maintenance, February, 1990
NIOSH Polarized Light Microscopy Post Graduate Course, March, 1990

## EXPERIENCE

Analysis:

| | |
|---|---|
| Transmission Electron Microscopy | November, 1988 - Present |
| Phase Contrast Microscopy | February, 1988 - Present |
| Polarized Light Microscopy | March, 1990 |

Industrial Hygienist:

| | |
|---|---|
| Air Monitoring | September, 1988 - Present |
| Asbestos Investigation | March, 1988 - Present |
| Asbestos Management Planning | June, 1988 - Present |

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## Quality Assurance Officer - Patricia Werner-Patak

### EDUCATION

Bachelor Degree Environmental Sciences. Fairleigh Dickinson University. June 1983

### SUMMARY OF EXPERIENCE

Environmental Testing Laboratories, Inc., Farmingdale, New York August 1990 - Present
May 1992 - Present
Quality Assurance Officer
Responsibilities include the development and implementation of a Quality Assurance/Quality Control progr Monitoring the lab's performance with blind samples and double blind samples; Performing internal audits data review for quality issues: Overseeing the introduction of proficiency samples to the lab from NYDOH NJDEPE. NIOSH and ELLAP; Answering client questions regarding quality issues. Acting liason betwee the lab and governing agencies for protocol changes and certification updates. Maintain lab certification an necessary analytical requirements for eight states.

October 1991-May 1992
Technical Specialist
Responsibilites included QA/QC development, project and sample management. and laboratory supply purchasing.

August 1990-October 1991
Inorganic Supervisor
Responsible for the day to day operation of the inorganic section of the lab; Developed the inorganic sectio include a wet chemistry department; was instrumental in the implementation of QA/QC procedures; installe and developed the Perkin Elmer Z5100 graphite furnace for metals analysis.

$H_2M$ Laboratories. Inc., Melville, New York August 1985 - August 1990
July 1988 - August 1990
Promotion responsibilities include the quality control and quality assurance of wet chemistry and metals da for Contract Laboratory Protocol (CLP) work. Organization of USEPA Lead studies, and writing propos for protocol work. Institution of CLP packages through Telecation Associations software and generation review of finished data. In charge of all the laboratory supply through numerous vendors.

August 1985 - June 1988
Technician in the inorganic and metals department. Responsible for the operation of the ARL 3410 Induct Coupled Plasma Spectrophotometer, the Perkin Elmer 5100 Graphite Furnace and the Varian GT 96 Grapl Furnace. Duties also included the analysis of waste water for Phenols, Cyanide. Total Kjeldahl Nitrogen. Ammonia. Total Alkalinity, and Solids.

### PERSONAL

American Chemical Society
New York Chapter of the Environmental Information Association

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**Lab Supervisor** - Peggy Parigoris

## EDUCATION

Bachelor of Science in Biology, SUNY Albany, May 1979

## SUMMARY OF EXPERIENCE

Environmental Testing Laboratories, Inc., Farmingdale, New York
April 1992 - Present
Lab Supervisor: Responsibilities include the scheduling and prioritizing of work flow in all areas of the lab, overseeing the daily operations of personnel, reviewing and signing of lab reports.

Pedneault Associates Testing Labs, Bohemia, New York
January 1988 - April 1992
Supervisor GC/MS Department: Hewlett Packard Rte-A operating system, three Model 5970's for analyses of volatiles and semi-volatiles in accordance with EPA protocols. Interpreted mass spectral data, compiled findings and finalized reports.
Technical Director: Oversaw GC and extraction departments; instituted new EPA protocols.

Citrus and Allied Essences, LTD.,Floral Park, New York
November 1985 - January 1988
Research Scientist: Identified unknown compounds using a Finnigan 1030 GC/MS for the purpose of duplicating flavors and fragrance materials. Performed routine quality control on essential oils, including gas chromatography and wet chemistry methods.

NYTEST Environmental, Inc.,Westbury, New York
January 1985 - November 1985
Quality Control Manager Implemented and maintained a Quality Control/Quality Assurance program for a major independent laboratory. Noteworthy responsibilities include: devised Standard Operating Procedures for GC and GC/MS analyses in accordance with EPA protocol; Instituted EPA/CLP protocol in GC/MS and atomic absorption departments; Examined QA/QC records of all analysts to ensure that performance criteria meet specifications; Trained and supervised technicians and support staff; Reviewed all final laboratory reports.

October 1983 - January 1985
GC/MS Operator: Operated Finnigan Models 1020 and 5100 for the analyses of semi-volatile compounds and Model 1030 for the determination of volatile compounds with EPA methods.

January 1980 - October 1983
Atomic Absorption Supervisor: Scheduled work flow for samples entering the department. Developed analytical methods concerning toxic and hazardous chemicals in diverse complex matrices. Reviewed and interpreted all analytical data and prepared laboratory reports.

June 1978 - January 1980
Chemical Technician: Performed routine colorimetric and gravimetric analyses. Operated flame, flameless and graphite atomic absorption spectrophotometers.

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**Chemist** : Bryan T. Harrigan

## EDUCATION

Bachelor of Science Resource Management
SUNY College of Environmental Science and Forestry, Syracuse, NY,May 1983

Associate of Science
Nassau Community College, Garden City, NY, June, 1981

## SUMMARY OF EXPERIENCE

Environmental Testing Laboratories, Inc., Farmingdale, New York
August 1992 - Present
Responsible for the operation and maintenance of HP Mass-Spectrometer. Additional responsibilities incl maintaining QC program, method development, and assist department supervisor in laboratory functions.

IEA, Inc., Monroe, CT
July 1988 - August 1992
GC/MS Chemist - Operated three HP 5995 and 5970 MSD systems for Volatile, Semi-volatile and Air analyses and review final data for reporting and packaging. Responsible for tracking all GC/MS required analyses for both holding and reporting times to ensure timely production of data. Other responsibilities include: source cleaning and maintenance, reporting weekly invoicing and cumulative revenue to departme supervisor, tracking GC/MS backlog using LIMS system and using computer form generation to complete packages for final reporting.

Volatile Group, Nanco Labs, Wappinger Fall, NY
May, 1987 - July, 1988
GC/MS Analyst - Responsible for operating three HP MSD Systems (HP-1000, E-Series with Aquarius Software) to analyze soil and water samples from loading to final data review. Report department product and quality control.

GC Operator - for methods 601/602, 503.1 (HALl/PID Detectors), % Solvent (TCD), Non-Halogenated Compounds (8010/8015 by FID), TOC/TOX (Dohrman Instruments).

# Environmental Testing Laboratories, Inc.

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**Chemist** - Dennis Costello

## EDUCATION

| | |
|---|---|
| St. Johns College, Queens N.Y. | M.S. 1989 Quantitative Organic Chemistry |
| Brooklyn College, Brooklyn N.Y. | B. S. 1969 Chemistry |
| Staten Island C.C., Staten Island N.Y. | A.A.S. 1961 Engineering Science |

## SUMMARY OF EXPERIENCES

| | |
|---|---|
| Environmental Testing Laboratories, Inc., Farmingdale, NY<br>Chemist - Inorganics Section | 12/88 - Present |
| St Johns University, Queens, NY<br>Laboratory Instructor | 1983 - Present |
| Meenan Oil Corporation<br>Sales | 1981 - 1983 |
| Queens College<br>Senior Laboratory Technician | 1961 - 1981 |

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**Chemist**- Juan R. Cuba

## EDUCATION

B.S. Chemical Engineering, University of Saint Andrews, La Paz, Bolivia 1981.

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories, Inc., Farmingdale, NY
4/92 - Present
Team Leader: Direct lab operations in organic analyses through gas chromatography for PCB's, pesticides, herbicides, petroleum products, alcohols, glycols and organic pollutants in air. R&D in gas chromatography to develop new methodologies.
Environmental Consultant: R&D for the treatment of industrial waters and developing technologies to minimize wastes and costs. Designed a complete chemical plant that performs several processes: recover metals, recover organic chemicals; purify industrial waters; and destroy both inorganic and organic pollutants. This design is part of a total project to obtain a Hazardous Waste Treatment Storgae and Disposal Permit from the New York Department of Environmental Conservation and the USEPA.

Stout Environmental, Farmingdale, NY
6/90 - 4/92
Directed hazardous waste management in-house operations in accordance with RCRA, CERCLA, TSCA, CAA and CWA regulations. Directed compliance procedures and evaluations of treatment options to develop the best technology to treat hazardous waste.

Chemical Management, Farmingdale, NY
5/87 - 6/90
Directed lab operations in a hazardous waste treatment plant. Implemented Standard Operating Procedures in accordance with EPA regulations and other related agencies. Set up QA/QC for wet chemistry(cyanides, fluorides, ammonia) for metal analyses through atomic absorption spectroscopy and for organic analyses through gas chromatography(PCB's and VOC's).

U.P.F.B. (Fiscal Bolivian Petroliferous Fields)
10/80-3/87
Chemical Engineer. Worked on gas wells, fields and plants in process control, transport and storage. Directed lab operations to carry out the different analyses related to the petroleum industry and its products. Set up QA/QC for ASTM tests, such as gas chromatography, Reid vapor tension, Engler distillation, corrosivity and other tests to determine the quality and physical chemical properties of petroleum products.

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**Chemist** - Maria Frak

Master's Degree, Physics,
Bachelor's Degree, Chemistry and Physics,
Maria Curie Sklodowska Univ, Lublin, Poland

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories, Inc., Farmingdale, NY
1/95 - Present
Responsible for the analysis of soil, groundwater and wasterwater samples for volatile organics using two GC/PID/HALL detectors.

Pednault Associates Inc., Bohemia
2/93 - 1/95
Responsible for GC, GC/MS and HPLC analysis of environmental samples.

Central Laboratory of Maria Curie-Sklodowska Univiversity of Poland
Specialized in studies of structure of chemical compounds using HRMS and ionization methods EI, CI, FI, FD, and FAB.

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**Chemist** - Ryszard M. Frak

## EDUCATION

Ph.D. in Physical Chemistry, 1979, Polish Academy of Science, Warsaw, Poland
Masters in Chemistry, 1972, Maria Curie-Sklodowska Univ, Lublin, Poland

## SUMMARY OF EXPERIENCES

Environmental Testing Labs, Inc., Farmingdale, NY
1/95 - Present
Responsible for the scheduling and analysis of soil, groundwater and wastewater for semi volatile compounds using Hewlett Packard 5970/5890 GC/MS.

Pednault Associates Inc., Bohemia, NY
2/93 - 1/95
Supervised Chemists, responsible for routine GC, GC/MS, and HPLC analyses of environmental samples. Preventative maintenance and repair of lab equipment. Programming of computers to report results according to EPA CLP requirements.

Volumetric Techniques, LTD, Bayport, NY
2/90 - 2/93
Supervised chemists performing GC, HPLC, and GC/MS analyses. Operation and troubleshooting of GC/MS, GC and HPLC instruments.

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**Asbestos Assistant**- Louis Lombardi

## EDUCATION

Bachelor Degree Environmental Sciences/Biology, LIU, Southampton Campus, 1992

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories, Inc., Farmingdale, NY
2/93 - Present
Asbestos Assistant: Prepare all samples for analysis by TEM, PCM and PLM analysis. Assist supervisor in the daily operation of the asbestos department. Maintain QA/QC records for the department.

Baccarat Homes, Inc.
6/87 - 9/92
Carpenter & Framer

## PERSONAL

NIOSH 582 Equivalent
Asbesos Sampling Technician #AH95-02588
PADI Certified

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**Chemist** - Daniel Mahoney

## EDUCATION

Certified Netware Engineer, Island Drafting and Technical Institute, Amityville, NY

Bachelors Degree, Environmental Science, State University College of Arts and Science at Plattsburgh, NY, 1992

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
10/92 - Present
Responsible for the daily operation of the GC volatile lab including reporting and review of all data for SW-846 and 600 series methods. Other responsibilities include training in the GC/MS department for operation of Hewlett Packard 5890/5971/5972 instruments.

## PERSONAL

Certificates:
Certified Netware Engineer(CNE)
Certified Netware Administrator(CNA)
Introduction to Capillary Gas Chromatography, Hewlett Packard
GC Trouble Shooting and Maintenance, Hewlett Packard

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## Chemist - Adrian D'netto

### EDUCATION

Bachelors Degree. Chemistry. Madras University. April 1974
Masters Degree. Analytical Chemistry. University of Maine, December 1984

### SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
5/94- Present
Responsible for the operation and troubleshooting of HP 5890/5972. 5971 using SW-846. 600 and 500 series methods.

Volumetric Techniques. Bayport, NY
10/93-5/94
Organic Supervisor. Analyses using SW-846 and 600 series methods using HP5890/5970 GC/MS with Chemstation software. Responsible for training chemists, method development and report review.

NYTEST Environmental, Port Washington, NY
5/91 - 4/93
Data Review Manager/QA/QC Director. Duties included review/validation of data: Mass Spec Iterpretation: Establishing data review and reporting procedures for EPA CLP, NJ CLP, NYS ASP and other protocols. Wrote SOP's, QApp's and answered clients QA/QC questions.

ETC. Baton Rouge. Louisiana
9/90 - 4/91
GC/MS Division Manager. GC/MS analyses using EPA CLP protocols: Mass Spectral Interprtation: report review: installed HP GC/MS with components from various sources without HP's help.

Chemical Waste Management, Texas
9/89 - 9/90
Organics Lab Supervisor. Started up Organics Lab for SW-846 analyses using HP GC/MS RTE/Aquarius and HP GC's with CHemstation software. Trained and supervised chemists and reviewed reports.

### PERSONAL

American Chemical Society

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## Chemist - Laura Taenzer

### EDUCATION

Bachelors Degree, Biology with Chemistry minor, SUNY Oneonta, December 1989
Associate Degree, Biology with Math minor, Adirondack Community College, May 1987

### SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
4/90 - Present
Responsible for scanning various matrices for BNA and volatile compounds by GC/MS direct injection and purge and trap. Tested for volatile compounds by GC/PID and Hall. Analyzed various matrices for PCB's, Pesticides and Herbicides by GC/ECD, performed petroleum product identification by by GC/FID. Performed extractions of organic compounds using EPA methods.

### PERSONAL

Career Related Courses:

| | |
|---|---|
| Restek Capillary Chromatography | 9/91 |
| Supelco Capillary Chromatography | 8/92 |
| Hewlett Packard Introdution to GC/MS | 3/93 |
| Hewlett Packard GC/MS | 12/93 |

Professional Memberships:
American Chemical Society

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## Chemist - Marcine Meister

### EDUCATION

Bachelor Degree, Chemistry, Canisius College, May 1993
Associate of Applied Science Degree in Chemical Technology, Alfred State College, May 1985

### SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
6/93 - Present
Performend extractions and sample preparation for SW-846 methods for the organic department.

Huntingdon Analytical Services, Middleport, NY
8/92 - 2/93

Occidental Chemical Corp, Niagra Falls, NY.
3/92 - 5/92

Union Carbide Corp. Linde Division, Tonawanda, NY
2/89 - 5/91

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## Chemist/QA/QC Assistant - Eric Frend

### EDUCATION

Bachelors Degree, Environmental Science, SUNY Plattsburgh, 1994,
Water Resource Concentration

### SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
1/95 - Present
Responsible for the compilation of data for QA/QC reduced data deliverable packages.

### PERSONAL

Volunteer Fireman, Bellport Fire Dept., Pi Kappa Phi

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Chemist - Thomas Hartill

## EDUCATION

Masters Degree, Environmental Technology, NY Institute of Technology(in progress)
Bachelors Degree, Environmental Studies, St. John's University, 1993

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
9/94 - Present
Team leader in the metals department. Responsible for the operation, maintanance and troubleshooting of Leeman PS1000 ICP, Perkin Elmer Zeeman 5100 graphite furnace, and Varian Spectra 20 AA for mercury analysis.

9/93-9/94
Analyzed and reported environmental samples analyzed via SW-846 and 600 series methods for volatile organics by GC.

1/93-9/93
Responsible for the sample extraction and preparation for SW-846 organic methods.

NYC DEP Bureau of Clean Water Process Control Section
9/92 - 1/93
Intern

Water and Sewage Treatment Enterprises Inc.
5/86 - 9/92
Senior Operator

## PERSONAL

Memberships
E.A.R.T.H. Club, Eagle Scout, Asst. Scoutmaster, Water Pollution Control Federation

Professional Courses
Conference on Laboratory Safety and Health, 10/1, 10/2/93
Conference on Chemical Health and Safety, 10/15/93
OSHA 40 hr HazMat Training
Leeman Labs PS Series ICP/Echelle Spectrometer Training 10/25-28/94

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Chemist - Victoria Harris

## EDUCATION

Bachelors Degree, Biology, SUNY Old Westbury, 1994

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
12/93 - Present
Analyzing soil, groundwater and wastewater by traditional wet chemistry methods found in Standard Methods for Water and Wastewater Analysis.

Pednault Associates, Inc., Bohemia, NY
3/90-8/93
Responsible for wet chemistry analysis of environmental samples.

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Chemist - Ruth Otero

## EDUCATION

Bachelor's Degree, Chemistry, University of Puerto Rico, 1992

## SUMMARY OF EXPERIENCES

Environmental Testing Laboratories Inc., Farmingdale, NY
10/94 - Present
Responsible for the sample peraration for the metals department following SW-846, EPA, NIOSH and ELAP methodologies for soil, groundwater, wastes and air matrices. Assist in the operation of a Leeman PS1000 ICP, Perkin Elmer Z5100 graphite furnace, and Varian Spectra 20 AA for mercury analysis.

High Technology Laboratory, Inc., Guaynabo, PR`
8/92 - 5/94
Sample preparation for metals, organic and inorganic analyses according to EPA methods. Preparation of SOP and QA/QC. Metals analysis by Atomic Absorption Spectrophotometer, ICP, Microwave Digestion and UV/VIS Spectrophotometry. Also knowledgeable in GC/MS and GC PID/HALL.

## PERSONAL

Memberships
Puerto Rico Chemist Association
Professional Courses/Seminars
TCLP seminar conducted by NJDEPE, 3/95
Atomic Absorption, ICP and ICP/MS, Varian Analytical Instruments, 5/25/93

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## Chemist/Field Service Technician - Brien Costello

### EDUCATION

Bachelors Degree, Environmental Science. St. Johns University, 1994

### SUMMARY OF EXPERIENCE

Environmental Testing Laboratories Inc., Farmingdale, NY
11/93- Present
Reponsible for the field sampling of in house and client requested sites. Perform inorganic analysis on environmental samples using "Standard Methods for Water and Wastewater Analyses".

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**Custodian** - Monica Alcalde

## SUMMARY OF EXPERIENCES

Environmental Testing Labs, Inc., Farmingdale, NY
3/94 - Present
Responsible for the custodial duties associated with environmental samples brought to the lab; maintaining supplies for sampling and shipping for five satellite offices; coordinate the sample analysis to fit the disposal facility requirements. Act as a liason between the sampler/project manager and the laboratory. Purchase all necessary supplies to maintain operation of an environmental lab.

Pednault Associates, Inc., Bohemia, NY
6/87 - 3/94
Technical Coordinator of various aspects of an environmental lab.

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**Office Manager:** Maureen Kavanagh

**EDUCATION:**

Architecture/Computer Science, NYIT, Westbury, 9/86-6/87
Liberal Arts, SUNY Stonybrook, NY 9/85-6/86

**SUMMARY OF EXPERIENCES**

Environmental Testing Labs, Inc., Farmingdale, NY
3/91 - Present
Office Manger: Responsible for client contact, assigning work to be done for each department, prepare invoices for all clients; oversee daily office operations and procedures.

12/90-3/91
Larry E. Tyree General Contracting, Farmingdale, NY
Administrative Assistant: Organize and schedule subcontractors; acquire permits.

7/89-12/90
Larry E. Tyree Co. Inc, Farmingdale, NY
Personnel Administrative Assistant: Implement company policies and procedures; insurance and pension plans; recruiting.

6/88-7/89
Tyree Brothers Environmental Services, Farmingdale, NY
General data entry and word processing.

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**Administrative Assistant**: Carol Marigliano

**EDUCATION:**
Kings Park Senior High School, Business Academic Diploma, 1990

**SUMMARY OF EXPERIENCES**

Environmental Testing Labs, Inc., Farmingdale, NY
8/92-Present
Duties include answering the phones, filing, data entry for all lab analyses, keep records of attendence and time sheets, purchase office supplies, prepare and review analysis reports for typographical errors, contact clients to resolve problems; accounts receiveable and other general office functions.

Long Island Cheese and Specialties, Happaugue, NY
9/90-8/92
Duties include answering the phones, filing, data entry, billing and purchasing consumer requests, domestic and foreign client contact, and other general office functions.

**PERSONAL**
Professional Skills:
Word Perfect, Lotus 123, Macintosh, Microsoft Word, MacDraw, Fax Machine and Copier.

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# Summary of Professional Expertise

| Personnel | # Employed |
|---|---|
| **Analytical Support** | |
| Senior Chromatographers | 5 |
| Mass Spectroscopists | 5 |
| Separation Chemists | 2 |
| Analytical Technicians | 5 |
| Inorganic Chemists | 4 |
| Special Project Chemists | 2 |
| QA Specialists | 2 |
| Production Support | 4 |
| **Regulatory and Project Support** | |
| Account Executives | 2 |
| Program Managers | 2 |
| Technical Project Managers | 2 |
| Project Design Specialists | 2 |
| **Field Support** | |
| Field Supervisors | 2 |
| Field Chemists | 3 |
| Sampling Technicians | 4 |
| **Legal Support** | |
| Contract Specialists | 4 |

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# IIK. SAMPLE REPORTS

Environmental Testing Laboratories, Inc.
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# ANALYSIS REPORT - EPA 602/8020 & MTBE

03/09/95

**Project**
ABC Service Center
123 Maple Street
New York, New York
**Handler**: Jane Smith

**Custody Document TEST**
Received: 03/09/95 12:00 PM
Sampled by: John Doe

---

**Sample 1**
Custody: TEST
Collected: 03/09/95
Location: Monitoring Well
Remarks:
Type: Grab
Matrix: Liquid

**Analysis Information**
Analyzed: 03/09/95
Remarks:

| Analyte | Concentration | Units | Dilution | MDL | Units |
|---|---|---|---|---|---|
| Benzene | <0.21 | ppb | 1 | 0.21 | ppb |
| Toluene | <0.39 | ppb | 1 | 0.39 | ppb |
| Clorobenzene | <0.18 | ppb | 1 | 0.18 | ppb |
| Ethylbenzene | <0.22 | ppb | 1 | 0.22 | ppb |
| m,p-Xylene | <0.19 | ppb | 1 | 0.19 | ppb |
| o-Xylene | <0.07 | ppb | 1 | 0.07 | ppb |
| 1,3-Dichlorobenzene | <0.17 | ppb | 1 | 0.17 | ppb |
| 1,4-Dichlorobenzene | <0.19 | ppb | 1 | 0.19 | ppb |
| 1,2-Dichlorobenzene | <0.13 | ppb | 1 | 0.13 | ppb |
| Mert-tert-butyl Ether | <0.059 | ppb | 1 | 0.059 | ppb |

**Review by:**_____

ppb=µg/L, µg/Kg; ppm=mg/L, mg/Kg; ND=Not Detected; B=in blank; NA=Not Analyzed: MDL=Method Detection Limit; nd=Not Determined; E=Quantitated above calibration; IDL=Instrument detection limit: Results of soil samples are based on dry weight basis: Air MDL's based on 1 liter of sample.

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 Phone: 516-249-1456

# CERTIFICATIONS

Environmental Testing Laboratories, Inc.
208 Route 109, Farmingdale, NY 11735 · Fax: 516-249-8344 · Phone: 516-249-1456

ETL is certified as follows (Certificates attached):

**New York State Department of Health**
*Environmental Analyses/Non-Potable Water*

**New York State Department of Health**
*Environmental Analyses/Solid and Hazardous Waste*

**New York State Department of Health**
*Environmental Analyses/Potable Water*

**New York State Department of Health**
*Environmental Analyses/Air and Emissions*

**State of Connecticut Department of Health Services**
*Potable Water, Wastewater, and/or Trade Waste, Sewage and/or Effluent, Soil, Asbestos*

**State of New Hampshire Department of Environmental Services**
*Wastewater Analyses*

**Commonwealth of Massachusetts Dept of Environmental Protection**
*Chemical Analysis of Non-Potable Water*

**State of New Jersey Department of Environmental Protection**
*Drinking Water and/or Water Pollution Limited Chemistry, Metals, Organics*

**NVLAP**
*Airborne Asbestos Fiber Analysis*

**State of New York Department of Labor**
*Asbestos Handling*

STATE OF NEW YORK - DEPARTMENT OF LABOR
DIVISION OF SAFETY AND HEALTH
License and Certificate Unit
ONE MAIN STREET
BROOKLYN, NY 11201

# ASBESTOS HANDLING LICENSE

LICENSE NUMBER: AC-94-0877
DATE OF ISSUE: 10-14-94
EXPIRATION DATE: 09-30-95

Contractor: ENVIRONMENTAL TESTING LABORATORIES, INC.

Address: 208 ROUTE 109
FARMINGDALE, NY 11735

Duly Authorized Representative: DANIEL J. SPANDAU

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. The licensee verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Maria L. Colavito

Maria L. Colavito, Director
FOR THE COMMISSIONER OF LABOR

DOSH-432 (2-91)

NEW YORK STATE DEPARTMENT OF HEALTH

MARK R. CHASSIN, M.D., M.P.P., M.P.H. *COMMISSIONER*

*Expires 12:01 AM April 1, 1995*
*ISSUED April 1, 1994*
*REVISED July 12, 1994*

# INTERIM CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*Lab ID No.: 10969*

*Director: MR. DANIEL SPANDAU*
*Lab Name: ENVIRONMENTAL TESTING LABS INC*
*Address : 208 ROUTE 109*
*FARMINGDALE NY 11735*

*is hereby APPROVED as an Environmental Laboratory for the category*

*ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS*

*All approved subcategories and/or analytes are listed below:*

aneous Air :
estos
ers

Chlorinated Hydrocarbons (ALL)

Purgeable Aromatics (ALL)

erial No.: 024628

Wadsworth Center for Laboratories and Research

roperty of the New York State Department of Health. Valid only at the address shown.
ust be conspicuously posted. Valid certificate has a red serial number.

OH-3317 (12/92)

NEW YORK STATE DEPARTMENT OF HEALTH

MARK R. CHASSIN, M.D., M.P.P., M.P.H. *COMMISSIONER*

*Expires 12:01 AM April 1, 1995*
*ISSUED April 1, 1994*
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# INTERIM CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*Lab ID No.: 10969*

*Director: MR. DANIEL SPANDAU*
*Lab Name: ENVIRONMENTAL TESTING LABS INC*
*Address : 208 ROUTE 109*
*FARMINGDALE NY 11735*

*is hereby APPROVED as an Environmental Laboratory for the category*

*ENVIRONMENTAL ANALYSES/ POTABLE WATER*

*All approved subcategories and/or analytes are listed below:*

ıking Water Non-Metals :
Alkalinity
Calcium Hardness
Nitrate (as N)
Hydrogen Ion (pH)
Solids, Total Dissolved
Sulfate (as SO4)

D.W. Miscellaneous :
Asbestos
Volatile Halocarbons (ALL)

Drinking Water Trihalomethane (ALL)
Drinking Water Metals II (ALL)

Drinking Water Metals I (ALL)
Volatile Aromatics (ALL)

Serial No.: 024627

Wadsworth Center for Laboratories and Research

Property of the New York State Department of Health. Valid only at the address shown.
Must be conspicuously posted. Valid certificate has a red serial number.

DOH-3317 (12/92)

NEW YORK STATE DEPARTMENT OF HEALTH

MARK R. CHASSIN, M.D., M.P.P., M.P.H. *COMMISSIONER*

*Expires 12:01 AM April 1, 1995*
*ISSUED April 1, 1994*
*REVISED July 12, 1994*

# INTERIM CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*Lab ID No.: 10969*

*Director: MR. DANIEL SPANDAU*
*Lab Name: ENVIRONMENTAL TESTING LABS INC*
*Address : 208 ROUTE 109*
*FARMINGDALE NY 11735*

*is hereby APPROVED as an Environmental Laboratory for the category*

*ENVIRONMENTAL ANALYSES NON POTABLE WATER*

*All approved subcategories and/or analytes are listed below:*

. Hydrocarbon Pesticides :
,4'-DDD
,4'-DDE
,4'-DDT
lpha-BHC
ldrin
eta-BHC
hlordane Total
elta-BHC
ieldrin
ndrin aldehyde
ndrin
ndosulfan I
ndosulfan II
ndosulfan sulfate
eptachlor
eptachlor epoxide
indane
ethoxychlor
oxaphene

Wastewater Miscellaneous :
Boron, Total
Cyanide, Total
Color
Phenols
Oil & Grease Total Recoverable
Hydrogen Ion (pH)
Specific Conductance
Temperature
Acrolein and Acrylonitrile (ALL)
Chlorophenoxy Acid Pesticides (ALL)
Haloethers (ALL)
Nitroaromatics and Isophorone (ALL)
Polychlorinated Biphenyls (ALL)
Purgeable Aromatics (ALL)
TCLP Additional Compounds (ALL)

Mineral :
Acidity
Calcium Hardness
Chloride
Fluoride, Total
Sulfate (as SO4)
Hardness, Total
Volatile Chlorinated Organics :
Benzyl chloride
Benzidines (ALL)
Chlorinated Hydrocarbons (ALL)
Wastewater Metals I (ALL)
Nitrosoamines (ALL)
Phthalate Esters (ALL)
Purgeable Halocarbons (ALL)

Wastewater Metals III :
Cobalt, Total
Molybdenum, Total
Tin, Total
Titanium, Total
Thallium, Total
Nutrient :
Kjeldahl Nitrogen, Total
Ammonia (as N)
Orthophosphate (as P)
Phosphorus, Total
Wastewater Metals II (ALL)
Polynuclear Aromatics (ALL)
Priority Pollutant Phenols (ALL)
Residue (ALL)

Serial No.: 024626

Wadsworth Center for Laboratories and Research

Property of the New York State Department of Health. Void unless at the address shown.
Must be conspicuously posted. Valid certificate has a red serial number.

DOH-3317 (12/92)

NEW YORK STATE DEPARTMENT OF HEALTH

MARK R. CHASSIN, M.D., M.P.P., M.P.H. *COMMISSIONER*

*Expires 12:01 AM April 1, 1995*
*ISSUED April 1, 1994*
*REVISED July 12, 1994*

# INTERIM CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*Lab ID No.: 10969*

*Director: MR. DANIEL SPANDAU*
*Lab Name: ENVIRONMENTAL TESTING LABS INC*
*Address : 208 ROUTE 109*
*FARMINGDALE NY 11735*

*is hereby APPROVED as an Environmental Laboratory for the category*

*ENVIRONMENTAL ANALYSES/AIR AND EMISSIONS*

*All approved subcategories and/or analytes are listed below:*

Miscellaneous Air :
Asbestos
Fibers

Chlorinated Hydrocarbons (ALL)

Purgeable Aromatics (ALL)

Serial No.: 024628

Wadsworth Center for Laboratories and Research

Property of the New York State Department of Health. Valid only at the address shown.
Must be conspicuously posted. Valid certificate has a red serial number.

DOH 3317 (12/92)

NEW YORK STATE DEPARTMENT OF HEALTH

MARK R. CHASSIN, M.D., M.P.P., M.P.H. *COMMISSIONER*

*Expires 12:01 AM April 1, 1995*
*ISSUED April 1, 1994*
*REVISED July 12, 1994*

# INTERIM CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

*Issued in accordance with and pursuant to section 502 Public Health Law of New York State*

*Lab ID No.: 10969*

*Director: MR. DANIEL SPANDAU*
*Lab Name: ENVIRONMENTAL TESTING LABS INC*
*Address : 208 ROUTE 109*
*FARMINGDALE NY 11735*

*is hereby APPROVED as an Environmental Laboratory for the category*

*ENVIRONMENTAL ANALYSES/SOLID AND HAZARDOUS WASTE*

*All approved subcategories and/or analytes are listed below:*

acteristic Testing :
Corrosivity
Ignitability
Reactivity
TCLP
E.P. Toxicity
eable Aromatics (ALL)

Miscellaneous :
Asbestos in Friable Material
Asbestos in Non-Friable Materia
Cyanide, Total
Lead in Paint
Hydrogen Ion (pH)
Purgeable Halocarbons (ALL)

Acrolein and Acrylonitrile (ALL)
Chlor. Hydrocarbon Pesticides (ALL)
Haloethers (ALL)
Metals II (ALL)
Polynuclear Arom. Hydrocarbon (ALL)
Phthalate Esters (ALL)
Volatile Chlorinate Organics (ALL)

Chlorophenoxy Acid Pesticides (ALL)
Chlorinated Hydrocarbons (ALL)
Metals I (ALL)
Nitroaromatics Isophorone (ALL)
Polychlorinated Biphenyls (ALL)
Priority Pollutant Phenols (ALL)

Serial No.: 024629

Wadsworth Center for Laboratories and Research

Property of the New York State Department of Health. Valid only at the address shown.
Must be conspicuously posted. Valid certificate has a five digit serial number.

DOH-3317 (12-92)

# STATE OF NEW JERSEY
# DEPARTMENT OF ENVIRONMENTAL PROTECTION

Let's protect our earth

*Certifies That*

Environmental Testing Labs, Inc.
208 Route 109
Farmingdale, NY 11735

*having duly met the requirements of the*

*Regulations Governing Laboratory Certification*
*And Standards Of Performance N.J.A.C. 7:18 et. seq.*

*is hereby approved as a*

## *State Certified Water Laboratory*

*To perform the analyses as indicated on the Annual Certified Parameter List*
*which must accompany this certificate to be valid*

#73812
PERMANENT CERTIFICATION NUMBER

May 20, 1991
DATE

COMMISSIONER
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**This certification is subject to unannounced laboratory inspections as specified by N.J.A.C. 7:18-2.11(d) and agreed to by the Laboratory Manager on filing the application**

**TO BE CONSPICUOUSLY DISPLAYED AT THE LABORATORY WITH THE ANNUAL CERTIFIED PARAMETER LIST.**

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF QUALITY ASSURANCE
ANNUAL CERTIFIED PARAMETER LIST FOR 1994-1995

)VIRONMENTAL TESTING LABS INC (73812) IS CERTIFIED TO PERFORM THE ANALYSES BELOW UNTIL JUNE 30 1995.

)RINKING WATER LABORATORY CERTIFICATION

LIMITED CHEMISTRY

018 ASBESTOS, "TEM"

951 PH, GLASS ELECTRODE

METALS

010 CALCIUM, ICAP

017 ALUMINUM, ICAP

025 ANTIMONY, GRAPH FURNACE

030 NICKEL, ICAP

031 THALLIUM, GRAPH FURNACE

035 ANTIMONY, ICAP

036 BERYLLIUM, ICAP

912 HG,MANUAL COLD VAPOR

914 AS, GRAPHITE FURNACE

918 PB, GRAPHITE FURNACE

920 SE, GRAPHITE FURNACE

921 AG, GRAPHITE FURNACE

954 NA, ATOMIC ABSORPTION

DRINKING WATER LABORATORY CERTIFICATION

METALS

960 ARSENIC, ICAP

961 BARIUM, ICAP

962 CADMIUM, ICAP

963 CHROMIUM, ICAP

964 LEAD, ICAP

965 SILVER, ICAP

966 COPPER, ICAP

967 IRON, ICAP

968 MANGANESE, ICAP

969 ZINC, ICAP

ORGANICS

943 TRIHALOMETHANES
CHLOROFORM
BROMOFORM
BROMODICHLOROMETHANE
DIBROMOCHLOROMETHANE

524.2 VOC (PT/GC-MS)

WATER POLLUTION LABORATORY CERTIFICATION

LIMITED CHEMISTRY

00010 TEMPERATURE

00095 SPECIFIC CONDUCTANCE

00400 HYDROGEN ION-PH

00500 TOT SOLIDS

WATER POLLUTION LABORATORY CERTIFICATION

LIMITED CHEMISTRY

00530 SUSP SOLIDS

00545 SETT SOLIDS-VOLUMETRIC

00546 SETT SOLIDS-GRAVIMETRIC

00556 OIL AND GREASE

00720 CYANIDE, TOTAL

00722 CYANIDE, AMEN TO CHLOR

00900 HARDNESS

32730 PHENOLS

70300 TOT DISS SOLIDS

METALS

00915 CALCIUM (ICAP)

00916 CALCIUM (AA)

00925 MAGNESIUM (ICAP)

00927 MAGNESIUM (AA)

00929 SODIUM (ICAP)

00930 SODIUM (AA)

00935 POTASSIUM (ICAP)

00937 POTASSIUM (AA)

01000 ARSENIC (ICAP)

01002 ARSENIC (AA/GF)

01005 BARIUM (ICAP)

WATER POLLUTION LABORATORY CERTIFICATION

METALS

01007 BARIUM (AA/GF)

01010 BERYLLIUM (ICAP)

01012 BERYLLIUM (AA/GF)

01025 CADMIUM (ICAP)

01027 CADMIUM (AA/GF)

01030 CHROMIUM (ICAP)

01032 CHROMIUM VI (AA)

01034 CHROMIUM (AA/GF)

01035 COBALT (ICAP)

01037 COBALT (AA/GF)

01040 COPPER (ICAP)

01042 COPPER (AA/GF)

01045 IRON (ICAP)

01046 IRON (AA/GF)

01049 LEAD (ICAP)

01051 LEAD (AA/GF)

01055 MANGANESE (ICAP)

01056 MANGANESE (AA/GF)

01057 THALLIUM (ICAP)

01059 THALLIUM (AA/GF)

01060 MOLYBDENUM (ICAP)

01065 NICKEL (ICAP)

WATER POLLUTION LABORATORY CERTIFICATION

METALS

01067 NICKEL (AA/GF)

01075 SILVER (ICAP)

01077 SILVER (AA/GF)

01085 VANADIUM (ICAP)

01087 VANADIUM (AA/GF)

01090 ZINC (ICAP)

01092 ZINC (AA/GF)

01095 ANTIMONY (ICAP)

01097 ANTIMONY (AA/GFO

01102 TIN (AA/GF)

01105 ALUMINUM (ICAP)

01106 ALUMINUM (AA/GF)

01145 SELENIUM (ICAP)

01147 SELENIUM (AA/GF)

ORGANICS

601 PURGEABLE HALOCARBONS(GC)

602 PURGEABLE AROMATICS (GC)

608 PESTICIDES & PCBS (GC)

612 CHLORIN HYDROCARBONS (GC)

624 PURGEABLES (GC/MS)

625 B/N, ACIDS & PEST (GC/MS)

WATER POLLUTION LABORATORY CERTIFICATION

ORGANICS

99007 PESTICIDES
- 39330 ALDRIN
- 39380 DIELDRIN
- 39360 DDD
- 39365 DDE
- 39370DDT
- 39410 HEPTACHLOR
- 39350 CHLORDANE

HIS LIST MUST BE CONSPICUOUSLY DISPLAYED WITH THE PERMANENT
ERTIFICATE AT THE LABORATORY

# State of Connecticut, Department of Health Services

## APPROVED PUBLIC HEALTH LABORATORY

*This is to certify that the laboratory described below has been approved by the State Department of Health pursuant to applicable provisions of the Public Health Code and General Statutes of Connecticut, for making the examinations, determinations, or tests specified below which have been authorized in writing by that Department.*

ENVIRONMENTAL TESTING LABORATORIES, INC.
Name of Laboratory

*Located at* .....208 Route 109..... *in* ..Farmingdale,.New.York.11735.....*and*

*registered in the name of* ....William F. Tyree.....

*This certificate is issued in the name of* ....Daniel J. Spandau.....*who has been designated by the registrant to be in charge of the laboratory work covered by this certificate of approval as follows:*

Potable Water, Wastewater, and/or Trade Waste, Sewage and/or Effluent, Soil

Examination for:
Inorganic Chemicals
Organic Chemicals

Asbestos
Air - Fiber Counting
Bulk - Identification

SEE COMPUTER PRINT-OUT FOR SPECIFIC TESTS APPROVED

*This certificate expires* .....June 30,..... *19* 95 *and is revocable for cause by the State Department of Health.*

*Dated at Hartford, Connecticut, this* .....5th.....*day of* ....October....., *19*93

Chief, Bureau of Laboratories

Division Director, Laboratory Standards

NO. ...PH-0645
OL 181B REV 8-90

CONNECTICUT STATE DEPARTMENT OF HEALTH

LABORATORY DIVISION

TUESDAY NOVEMBER 9, 1993 8:02 AM

REGISTRATION DATE 07/01

PH0645 ENVIRONMENTAL TESTING LABS., INC 208 ROUTE 109 FARMINGDALE, NY 11735
REGISTRANT WILLIAM E. TYREE DIRECTOR DANIEL J. SPANDAU
CO-DIRECTOR
MEDICARE NUMBER- INTERSTATE NUMBER-

| | |
|---|---|
| TEST 200 | POTABLE WATER |
| TEST 201 | WASTEWATER AND/OR TRADE WASTE |
| TEST 202 | SEWAGE AND/OR EFFLUENT |
| TEST 203 | SOIL |
| TEST 230 | CHEMISTRY |
| TEST 231 | INORGANIC CHEMICALS |
| TEST 232 | PHYSICAL EXAMS |
| TEST 233 | COLOR |
| TEST 236 | PH |
| TEST 237 | CONDUCTIVITY |
| TEST 235 | MINERALS |
| TEST 242 | HARDNESS |
| TEST 248 | FLUORIDE |
| TEST 258 | MISCELLANEOUS |
| TEST 259 | TOTAL SOLIDS |
| TEST 262 | TOTAL SUSPENDED SOLIDS |
| TEST 263 | CYANIDE |
| TEST 264 | IGNITABILITY |
| TEST 270 | METALS |
| TEST 271 | ALUMINUM |
| TEST 272 | ANTIMONY |
| TEST 273 | ARSENIC |
| TEST 274 | BARIUM |
| TEST 275 | BERYLLIUM |
| TEST 277 | CADMIUM |
| TEST 278 | CHROMIUM TOTAL |
| TEST 279 | CHROMIUM VI |
| TEST 280 | COBALT |
| TEST 281 | COPPER |
| TEST 282 | IRON |
| TEST 283 | LEAD |
| TEST 285 | MAGNESIUM |
| TEST 286 | MANGANESE |
| TEST 287 | MERCURY |
| TEST 288 | MOLYBEDNUM |
| TEST 289 | NICKEL |
| TEST 290 | POTASSIUM |
| TEST 291 | SELENIUM |
| TEST 292 | SILVER |
| TEST 293 | SODIUM |

| | |
|---|---|
| TEST 294 | THALLIUM |
| TEST 296 | TITANIUM |
| TEST 297 | VANADIUM |
| TEST 298 | ZINC |
| TEST 311 | ORGANIC CHEMICALS |
| TEST 312 | PURGEABLE HALOCARBONS |
| TEST 313 | PURGEABLE AROMATICS |
| TEST 314 | PESTICIDES |
| TEST 315 | HERBICIDES |
| TEST 316 | PCB |
| TEST 317 | PCB IN OIL |
| TEST 320 | PHENOLS |
| TEST 321 | BENZIDINES |
| TEST 322 | PHTHALATE ESTERS |
| TEST 323 | NITROSAMINES |
| TEST 324 | NITROAROMATICS AND ISOPHORONE |
| TEST 325 | POLYNUCLEAR AROMATIC HYDROCARBONS |
| TEST 326 | HALOETHERS |
| TEST 327 | CHLORINATED HYDROCARBONS |
| TEST 331 | OIL AND GREASE |
| TEST 357 | ASBESTOS |
| TEST 358 | AIR |
| TEST 359 | BULK MATERIALS |

# The Commonwealth of Massachusetts

## Department of Environmental Protection
## Division of Environmental Analysis

*Certifies*

*Laboratory ID #:* M-NY061

Environmental Testing Laboratories, Inc.
208 Route 109
Farmingdale, NY 11735

*for the Chemical Analysis of Non-Potable Water*

*pursuant to 310 CMR 42.00*

*Laboratory Director:* Daniel J. Spandau

*Expiration Date:* 06/30/96

*This certificate supercedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.*

*This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P.*

*Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.*

Oscar C. Gonzalez

*Director, Division of Environmental Analysis*

01/01/95
Issued

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List

01/01/95

M-NY061 Environmental Testing Laboratories, Inc. EXPIRES: 06/30/9
Farmingdale, NY

NON-POTABLE WATER

201 Aluminum
202 Antimony
203 Arsenic
204 Beryllium
205 Cadmium
206 Chromium
208 Copper
209 Iron
210 Lead
211 Manganese
212 Mercury
214 Nickel
215 Selenium
216 Silver
220 Vanadium
221 Zinc
222 pH
224 Total Dissolved Solids
225 Total Hardness (CaCO3)
226 Calcium
227 Magnesium
228 Sodium
242 Total Cyanide
243 Non-Filterable Residue
245 Oil and Grease
* 246 Total Phenolics
247 Volatile Halocarbons
248 Volatile Aromatics
249 Chlordane
250 Aldrin
251 Dieldrin
252 DDD
253 DDE
254 DDT
255 Heptachlor

* Provisional Certification

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List

01/01/95

M-NY061 Environmental Testing Laboratories, Inc. EXPIRES: 06/30/96
Farmingdale, NY

NON-POTABLE WATER

256 Heptachlor Epoxide

* Provisional Certification

**The State of New Hampshire**
**Department of Environmental Services**

# CERTIFICATE OF APPROVAL
## Drinking Water Analysis

*Issued to*
Environmental Testing Laboratories

*Located at*
208 Route 109, Farmingdale, NY

*Under the provisions of the Regulations in Env-C300*
*for the following analyses:*

FULL CERTIFICATION: Metals by Graphite Furnace, Metals by ICP, Mercury, Total Filterable Residue, pH, Sodium, Total Cyanide, Trihalomethanes, Volatile Organics, and Vinyl Chloride.

PROVISIONAL CERTIFICATION: Calcium.

REPLACES CERTIFICATE #252594-A

CERTIFICATE NUMBER: 252594-C

DATE OF ISSUE: March 7, 1995

Certifying Officer

EXPIRATION DATE: October 4, 1995

United States Department of Commerce
National Institute of Standards and Technology

# NVLAP®

ISO/IEC GUIDE 25:1990
ISO/IEC GUIDE 58:1993
ISO 9002:1994

## Certificate of Accreditation

DEPARTMENT OF COMMERCE ★ UNITED STATES OF AMERICA ★

## ENVIRONMENTAL TESTING LABORATORIES, INC.

FARMINGDALE, NY

*is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:*

## AIRBORNE ASBESTOS FIBER ANALYSIS

**July 1, 1995**

*Effective until*

*For the National Institute of Standards and Technology*

NVLAP LAB CODE: 1937

ENVIRONMENTAL LEAD PROFICIENCY ANALYTICAL TESTING (ELPAT) PROGRAM
INDIVIDUAL LABORATORY REPORT FOR ROUND 009
LAB ID=07812

| SAMPLE TYPE | SAMPLE NO. | REPORTED RESULTS | REFERENCE VALUES * | ACCEPTABLE RANGE # LOWER | UPPER | LAB § PERFORMANCE | Z & SCORE |
|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 1 | 0.4267 | 0.5499 | 0.4025 | 0.6973 | A | -2.51 |
| | 2 | 0.0408 | 0.0481 | 0.0354 | 0.0608 | A | -1.73 |
| | 3 | 2.8527 | 4.7702 | 3.8909 | 5.6496 | L | -6.54 |
| | 4 | 0.3151 | 0.4245 | 0.3189 | 0.5301 | L | -3.11 |
| Soil (mg/kg) | 1 | 471.6 | 500.9 | 433.3 | 568.5 | A | -1.30 |
| | 2 | 968.1 | 957.2 | 794.6 | 1119.7 | A | 0.20 |
| | 3 | 502.9 | 502.4 | 431.9 | 573 | A | 0.02 |
| | 4 | 82.6 | 89.5 | 69.5 | 109.5 | A | -1.03 |
| Dust Wipes (ug) | 1 | 807 | 884.8032 | 729.4 | 1040.2 | A | -1.50 |
| | 2 | 249.9 | 330.9258 | 224.9 | 437 | A | -2.29 |
| | 3 | 92.8 | 108.3774 | 84 | 132.8 | A | -1.92 |
| | 4 | 431.7 | 478.629 | 376.6 | 580.6 | A | -1.38 |

* Reference value is the mean of the reference laboratories
≠ Upper limit: reference value + 3 standard deviations
Lower limit: reference value - 3 standard deviations
§ A : Analysis acceptable; - : Results not reported
H: Results > upper limit, not acceptable
L: Results < lower limit, not acceptable
& Z Score = (reported result-reference value)/standard deviation

LABORATORY YEAR-TO-DATE PERFORMANCE REPORT
LAB ID=07812

| SAMPLE TYPE | ROUND NO. | ROUND * PERFORMANCE | ACCUMULATED 4 ROUNDS | (%) | PERFORMANCE 2 ROUNDS | (%) | PROFICIENCY RATING # |
|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 006 | 4/4 | | | | | |
| | 007 | 1/4 | | | | | |
| | 008 | 4/4 | | | | | |
| | 009 | 2/4 | 11/16 | 68 | 6/8 | 75 | NP |
| Soil (mg/kg) | 006 | 4/4 | | | | | |
| | 007 | 4/4 | | | | | |
| | 008 | 4/4 | | | | | |
| | 009 | 4/4 | 16/16 | 100 | 8/8 | 100 | P |
| Dust Wipes (ug) | 006 | 4/4 | | | | | |
| | 007 | 4/4 | | | | | |
| | 008 | 4/4 | | | | | |
| | 009 | 4/4 | 16/16 | 100 | 8/8 | 100 | P |

* The denominators represent the number of total samples analyzed.
The numerators represent the number of acceptable results.
# P : Proficient NP: Nonproficient -: Not Rated
Performance ratings are based on accumulated results over four rounds (one year). A lab's performance in ground paint chips, soil, or dust wipes is rated proficient (P), if: 1) three-fourths (75%) or more of the accumulated results over four rounds are acceptable or 2) for the last two rounds, all samples are analyzed and the results are 100 % acceptable.

ENVIRONMENTAL LEAD PROFICIENCY ANALYTICAL TESTING (ELPAT) PROGRAM
SUMMARY STATISTICS OF REFERENCE LABORATORIES FOR ROUND 008

| SAMPLE TYPE | SAMPLE | N | MEAN | MINIMUM | MAXIMUM | STD | RSD(%) | ACCEPTABLE RANGE |
|---|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 1 | 31 | 0.322 | 0.294 | 0.3444 | .018 | 5.5 | 0.2685 - 0.3756 |
| | 2 | 31 | 3.5563 | 3.2137 | 3.823 | .186 | 5.2 | 2.9992 - 4.1133 |
| | 3 | 31 | 0.0784 | 0.0698 | 0.0888 | .006 | 8.2 | 0.0591 - 0.0977 |
| | 4 | 31 | 0.7435 | 0.67 | 0.875 | .058 | 7.8 | 0.5692 - 0.9177 |
| Soil (mg/kg) | 1 | 31 | 1620.1 | 1480 | 1729.4 | 78.6 | 4.9 | 1384.1 - 1856.1 |
| | 2 | 31 | 44.2 | 31.2 | 61.3 | 8.58 | 19.4 | 18.4 - 70 |
| | 3 | 31 | 251.1 | 211 | 286.2 | 25.5 | 10.1 | 174.6 - 327.6 |
| | 4 | 31 | 791.9 | 724.7 | 847.6 | 43.4 | 5.5 | 661.6 - 922.1 |
| Dust Wipes (ug) | 1 | 31 | 469.1 | 409 | 521.2 | 35.8 | 7.6 | 361.8 - 576.4 |
| | 2 | 31 | 104.6 | 86.2 | 119.8 | 10.2 | 9.7 | 74 - 135.2 |
| | 3 | 31 | 1302.1 | 1112.7 | 1454.5 | 107 | 8.2 | 980 - 1624.1 |
| | 4 | 31 | 241.9 | 213 | 278 | 20.5 | 8.5 | 180.3 - 303.5 |

SUMMARY STATISTICS OF ALL LABORATORIES PARTICIPATED

| SAMPLE TYPE | SAMPLE | N | MEAN | MINIMUM | Q1 | MEDIAN | Q3 | MAXIMUM |
|---|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 1 | 299 | 0.3285 | 0.0037 | 0.2998 | 0.3186 | 0.3329 | 3.1826 |
| | 2 | 299 | 3.602 | 0.033 | 3.3557 | 3.5461 | 3.7276 | 33.0572 |
| | 3 | 299 | 0.0989 | 0.0008 | 0.0734 | 0.0795 | 0.0852 | 3.9474 |
| | 4 | 299 | 0.7465 | 0.0067 | 0.6948 | 0.735 | 0.7782 | 3.3069 |
| Soil (mg/kg) | 1 | 259 | 1628.1 | 591 | 1521.10 | 1611.2 | 1692.70 | 9750 |
| | 2 | 259 | 46.2 | 0 | 36.8000 | 42 | 49.0000 | 285 |
| | 3 | 259 | 271.1 | 91.7 | 237.000 | 257.7 | 279.800 | 1363.2 |
| | 4 | 259 | 790.4 | 160.2 | 742.000 | 786.7 | 822.500 | 4331.2 |
| Dust Wipes (ug) | 1 | 279 | 478.1 | 4.1 | 439.100 | 471.8 | 500.000 | 4400 |
| | 2 | 279 | 108.4 | 0.9 | 96.5000 | 105 | 111.000 | 990 |
| | 3 | 279 | 1297.4 | 11 | 1232.00 | 1323 | 1400.00 | 3075.9 |
| | 4 | 279 | 253.1 | 1.9 | 220.000 | 237 | 254.100 | 2720 |

SUMMARY OF PERFORMANCE - ALL LABORATORIES PARTICIPATED

| SAMPLE TYPE | SAMPLE NO. | N OF LABS RATED | ACCEPTABLE LABS | LOW OUTLIER | HIGH OUTLIER |
|---|---|---|---|---|---|
| Paint Chips (%) | 1 | 299 | 273 | 17 | 9 |
| | 2 | 299 | 253 | 29 | 17 |
| | 3 | 299 | 273 | 11 | 15 |
| | 4 | 299 | 276 | 11 | 12 |
| Soil (mg/kg) | 1 | 259 | 234 | 18 | 7 |
| | 2 | 259 | 236 | 6 | 17 |
| | 3 | 259 | 244 | 5 | 10 |
| | 4 | 259 | 237 | 16 | 6 |
| Dust Wipes (ug) | 1 | 279 | 256 | 14 | 9 |
| | 2 | 279 | 260 | 9 | 10 |
| | 3 | 279 | 262 | 10 | 7 |
| | 4 | 279 | 262 | 14 | 3 |

07812 M X A O
DANIEL J SPANDAU
ENVIRONMENTAL TESTING LABS, INC
208 ROUTE 109
FARMINGDALE, NY 11735

PROFICIENCY ANALYTICAL TESTING PROGRAM
LABORATORY PERFORMANCE - ROUND 120

| | | | RND120 STATISTICAL SUMMARY | | | | | LABORATORY RESULTS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CONTAMINANT | SAMPLE | REF. VALUE | PERFORMANCE LIMITS | NO. LABS | OUTLIERS HI | LO | TOT | R120 DATA | PROF RATING | OUTLIER SUMMARY 117 | 118 | 119 | 120 |
| METALS | CADMIUM (CAD) | 1 | 0.0107 | 0.0096-0.0119 | 388 | 17 | 24 | 41 | 0.0110 | P | | | | |
| | (MG) | 2 | 0.0088 | 0.0076-0.0101 | | 4 | 19 | 23 | 0.0092 | | | HI | | |
| | | 3 | 0.0059 | 0.0053-0.0065 | | 25 | 26 | 51 | 0.0059 | | | HI | | |
| | | 4 | 0.0179 | 0.0159-0.0199 | | 10 | 19 | 29 | 0.0177 | | | HI | | |
| | CHROMIUM (CHR) | 1 | 0.2179 | 0.1855-0.2503 | 384 | 9 | 18 | 27 | 0.1988 | | | | | |
| | (MG) | 2 | 0.1335 | 0.1092-0.1578 | | 9 | 16 | 25 | 0.1072 | | | | | LO |
| | | 3 | 0.0610 | 0.0527-0.0692 | | 16 | 21 | 37 | 0.0537 | | | | | |
| | | 4 | 0.0796 | 0.0647-0.0945 | | 10 | 12 | 22 | 0.0748 | | | | | |
| | LEAD (LEA) | 1 | 0.0441 | 0.0387-0.0496 | 395 | 13 | 15 | 28 | 0.0423 | | | | | |
| | (MG) | 2 | 0.0959 | 0.0818-0.1100 | | 8 | 12 | 20 | 0.0939 | | | | | |
| | | 3 | 0.0232 | 0.0190-0.0274 | | 15 | 10 | 25 | 0.0223 | | | | | |
| | | 4 | 0.0802 | 0.0688-0.0917 | | 11 | 11 | 22 | 0.0752 | | | | | |
| SILICA | SILICA (SIL) | 1 | 0.1131 | 0.0319-0.1943 | 90 | 1 | 1 | 2 | | - | - | - | - | - |
| | (MG) | 2 | 0.0988 | 0.0330-0.1646 | | 1 | 2 | 3 | | | - | - | - | - |
| | | 3 | 0.0564 | 0.0167-0.0961 | | 3 | 1 | 4 | | | - | - | - | - |
| | | 4 | 0.0735 | 0.0255-0.1214 | | 1 | 4 | 5 | | | - | - | - | - |
| ASBESTOS | ASBESTOS (ASB) | 1 | 469.40 | 294.30-685.20 | 1114 | 88 | 30 | 118 | 732.50 | P | | | | HI |
| | (F/MM2) | 2 | 223.40 | 112.60-371.80 | | 72 | 14 | 86 | 389.90 | | | | | HI |
| | | 3 | 668.30 | 374.80-1046.0 | | 58 | 22 | 80 | 984.10 | | | | | |
| | | 4 | 312.90 | 159.50-517.60 | | 52 | 13 | 65 | 619.60 | | | | | HI |
| ORGANIC SOLVENTS | METHANOL (MOH) | 1 | 0.8208 | 0.6588-0.9827 | 349 | 15 | 15 | 30 | 0.7265 | P | HI | | | |
| | (MG) | 2 | 0.4743 | 0.3731-0.5755 | | 18 | 14 | 32 | 0.4711 | | | LO | | |
| | | 3 | 0.3485 | 0.2828-0.4142 | | 16 | 14 | 30 | 0.3415 | | | | | |
| | | 4 | 0.1902 | 0.1508-0.2297 | | 16 | 17 | 33 | 0.1889 | | HI | | | |
| | | OVERALL: | | | 1305 | | | | | P | | | | |

PROFICIENCY RATINGS: P =PROFICIENT
NP =# OF TIMES NONPROFICIENT
- =ANALYSIS NOT PERFORMED OR NOT RATED

OUTLIER SUMMARY: BLANK =ANALYSIS ACCEPTABLE
- =ANALYSIS NOT PERFORMED
HI =HIGH OUTLIER
LO =LOW OUTLIER

NOTE: ONLY ONE PROFICIENCY RATING IS GIVEN FOR METALS AND ONLY ONE PROFICIENCY RATING IS GIVEN FOR ORGANIC SOLVENTS.

ENVIRONMENTAL LEAD PROFICIENCY ANALYTICAL TESTING (ELPAT) PROGRAM
INDIVIDUAL LABORATORY REPORT FOR ROUND 007
LAB ID=07812

| SAMPLE TYPE | SAMPLE NO | REPORTED RESULTS | REFERENCE VALUES * | ACCEPTABLE RANGE # LOWER | UPPER | LAB @ PERFORMANCE | Z & SCORE |
|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 1 | 0.97 | 0.7454 | 0.5536 | 0.9372 | H | 3.51 |
| | 2 | 0.15 | 0.1135 | 0.09 | 0.137 | H | 4.66 |
| | 3 | 0.37 | 0.2729 | 0.2 | 0.3459 | H | 3.99 |
| | 4 | 2.2 | 1.7189 | 1.1867 | 2.2511 | A | 2.71 |
| Soil (mg/kg) | 1 | 951 | 959.4 | 707.4 | 1211.5 | A | -0.10 |
| | 2 | 88.8 | 89.6 | 61 | 118.1 | A | -0.08 |
| | 3 | 1841 | 1754.3 | 1335.9 | 2172.6 | A | 0.62 |
| | 4 | 416 | 413.2 | 328.9 | 497.5 | A | 0.10 |
| Dust Wipes (ug) | 1 | 452 | 485.8 | 346.9 | 624.7 | A | -0.73 |
| | 2 | 865 | 872.8306 | 653.9 | 1091.7 | A | -0.11 |
| | 3 | 523 | 492.3694 | 396.6 | 588.1 | A | 0.96 |
| | 4 | 28.1 | 20.6917 | 9.9 | 31.5 | A | 2.06 |

* Reference value is the mean of the reference laboratories
\# Upper limit: reference value + 3 standard deviations
Lower limit: reference value - 3 standard deviations
@ A : Analysis acceptable; - : Results not reported
H: Results > upper limit, not acceptable
L: Results < lower limit, not acceptable
& Z Score = (reported result-reference value)/standard deviation

LABORATORY YEAR-TO-DATE PERFORMANCE REPORT
LAB ID=07812

| SAMPLE TYPE | ROUND NO. | ROUND * PERFORMANCE | ACCUMULATED 4 ROUNDS | (%) | PERFORMANCE 2 ROUNDS | (%) | PROFICIENCY RATING # |
|---|---|---|---|---|---|---|---|
| Paint Chips (%) | 005 | 3/4 | | | | | |
| | 006 | 3/4 | | | | | |
| | 007 | 1/4 | 9/12 | 75 | 5/8 | 62 | P |
| Soil (mg/kg) | 005 | 4/4 | | | | | |
| | 006 | 4/4 | | | | | |
| | 007 | 4/4 | 12/12 | 100 | 8/8 | 100 | P |
| Dust Wipes (ug) | 005 | 4/4 | | | | | |
| | 006 | 4/4 | | | | | |
| | 007 | 4/4 | 12/12 | 100 | 8/8 | 100 | P |

* The denominators represent the number of total samples analyzed.
The numerators represent the number of acceptable results.
\# P : Proficient NP: Nonproficient -: Not Rated
Performance ratings are based on accumulated results over four rounds (one year). A lab's performance in ground paint chips, soil, or dust wipes is rated proficient (P), if: 1) three-fourths (75%) or more of the accumulated results over four rounds are acceptable or 2) for the last two rounds, all samples are analyzed and the results are 100 % acceptable.

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. Box 509 Albany, New York 12201-0509

Barbara A. DeBuono, M.D., M.P.H.
*Commissioner*

Karen Schimke
*Executive Deputy Commissioner*

MARCH 17, 1995

Dear Laboratory Director:

Please note that although your ELAP Certificate of Approval expires on 12:01 AM April 1, 1995, it is still valid until June 30, 1995 pending receipt of your 1995-96 Certificate(s), as per ELAP Certification Manual, No. 140, Page 7 of 25, dated 4/1/86, Part 55-2.4e NYCRR. "All environmental laboratory approval will, during the pendency of inspections or extension or grace period permitted by this subpart, remain in force beyond the normal expiration dates of certificates unless such approval is specifically revoked or suspended in writing."

Notification regarding the issuance of 1995-96 ELAP Certificate(s) of Approval is pending receipt of all non-governmental laboratories' Total Adjusted Volumes and Approval of the 1995-96 ELAP Budget by the New York State Legislature.

Further verification of your laboratory's approved ELAP status is available by calling the Program Office at (518) 485-5570.

Sincerely,

Linda L. Madlin

Linda L. Madlin
Administrative Assistant
Environmental Laboratory
Approval Program

LLM:saw

# APPENDIX 8

# HEALTH AND SAFETY PLAN

# SITE SPECIFIC SAFETY AND HEALTH PLAN
## For Other Than Gasoline

### SECTION 1: GENERAL INFORMATION & ACKNOWLEDGMENTS

CLIENT NAME: Bedford Affiliates PROJECT NAME: Ron Hill Cleaners

PROJECT MANAGER: Dawn Medaglia JOB NUMBER: 934cc2

SITE SUPERINTENDENT: Ken Watson/Rick Doxey REVISION: _____

SITE HEALTH & SAFETY OFFICER: Ken Watson/Rick Doxey

PREPARED BY: Dawn Medaglia DATE: 1-5-94

SHORT FORM APPROVED BY: DATE:

Health & Safety Manager: [signature] 1-5-94

Project Manager: [signature] 1-5-94

Site Superintendent: [signature] 1-5-94 1-5-94.

### SECTION 2: PROJECT INFORMATION

1. WILL POTENTIAL HAZARDS TO ON-SITE PERSONNEL EXIST? (YES OR NO)

Physical: Yes (If yes, see Section 3)

Chemical: Yes (If yes, see Section 4)

Confined Space Entry: No (If yes, see Section 6)

2. SITE INFORMATION:

Site Name: Ron Hill Cleaners Site Contact: Bedford Affiliates

Address: 71 Forest Avenue Telephone: (516) 829-9520

Glen Cove, N.Y.

3. SITE CLASSIFICATION: (Check all that apply)

| | | | | | |
|---|---|---|---|---|---|
| ____ | Hazardous (RCRA) | ____ | Hazardous (CERCLA) | ✓ | Other |
| ____ | Construction | ____ | UST/LUST | ____ | Active |
| ____ | Sanitary Landfill | ____ | Manufacturing | ✓ | Inactive |

4. PURPOSE AND DATE(S) OF FIELD VISIT(S): ~~Drilling, sampling, surveying~~ Environmental Assessment - 1994: pending approval of NYSDEC

5. TASKS: Drilling, well installation, sampling, surveying

6. ON-SITE ORGANIZATION: Subject to change

| Tyree Personnel | Responsibilities |
|---|---|
| Ken Watson*/Rick Dixey* | Driller |
| Dawn Medaglia | Hydrogeologist |
| | |
| | |
| | |
| | |

NOTE: Identify on-site Supervisor with an asterisk (*).

NOTE: This Site Safety Plan has been prepared for use by Tyree employees. Tyree claims no responsibility for its use by others. The plan is written for the specific site conditions, purposes, dates and personnel specified and must be amended if these conditions change.

Contractors and subcontractors whose work will be performed on-site, or who otherwise could be exposed to health and safety hazards, will be advised of known hazards through distribution of site information obtained by Tyree from others and this Site Safety Plan (SSP). They shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. All contractors and subcontractors are responsible for: 1) Providing their own personal protective equipment; 2) Training their employees in accordance with applicable Federal, State and local laws; 3) Providing medical surveillance and obtaining medical approvals for their employees; 4) Ensuring their employees are advised of and meet the minimum requirements of this SSP and any other additional measures required by their site activities and 5) Designating their own Site Safety Officer.

7. BACKGROUND INFORMATION: (Attach existing description and map, if available)

Tetrachloroethylene and trichloroethylene contaminated soil present within building and in shallow soil behind building.

## SECTION 3: PHYSICAL HAZARDS INFORMATION

1. IDENTIFY POTENTIAL PHYSICAL HAZARDS TO WORKERS:

| | | |
|---|---|---|
| ___ Confined Space | ___ Steep/Uneven Terrain | ___ Surface Waters |
| ✓ Heavy Equipment | ___ Heat Stress | ✓ Drum Handling |
| ✓ Moving Parts | ___ Extreme Cold | ✓ Noise |

Describe other unsafe environments ___

2. PROTECTIVE EQUIPMENT REQUIRED? Yes (✓) No ( )

If yes, complete Section 3

3 SAFETY EQUIPMENT REQUIRED:

| | | |
|---|---|---|
| ___ Harnesses | ___ Stretcher | ___ Lights |
| ___ Explosimeter | ✓ Eye Wash | ___ Lights - Emergency |
| ___ Blower | ___ Shower | ✓ Safety Cones |
| ___ Lifeline | ✓ Barrier Tape | ___ Communications On-site |
| ___ Ladder | ___ Fire Extinguisher | ___ Communications Off-site |
| ✓ First Aid Kit | ___ Emergency Air Horn | ___ Traffic Vest |
| ___ SCBA | ___ Full Body Harness | |

Describe other Hardhat, work boots, gloves

4. See Section 9 for additional safe work practices.

## SECTION 4: CHEMICAL HAZARDS INFORMATION

1. IDENTIFIED CONTAMINANTS:

Known or suspected hazardous/toxic materials (Attach tabulated data, if available).

| Media | Substances Involved | Characteristics | Estimated Concentrations |
|---|---|---|---|
| SL | Tetrachloroethylene | VO | 0 - 14,000,000 ppb |
| SL | Trichloroethylene | VO | 0 - 1,000 ppb |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Media Types: GW (ground water), SW (surface water), WW (wastewater), AI (air), SL (soil), SD (sediment), LE (leachate), WA (waste), OT (other), WL (waste, liquid), WS (waste, solid), WD (waste, sludge), WG (waste, gas)

Characteristics: CA (corrosive, acid), CC (corrosive, caustic), IG (ignitable), RA (radioactive), VO (volatile), TO (toxic), RE (reactive), UN (unknown), OT (other, describe)

2. DESCRIBE POTENTIAL HAZARDS FOR EACH MEDIA TYPE:

Exceeding TWA for referenced substances

3. OVERALL SITE HAZARD LEVEL:

___ Serious ___ Moderate ✓ Low ___ Unknown

5 SITE MONITORING REQUIRED? Yes (✓) No ( )

If yes, identify monitoring equipment below:

____ HNU Meter (Lamp ____ eV) ____ Geiger Counter
____ Explosimeter ____ Respirable Dust Monitor
____ Organic Vapor Analyzer (OVA) ✓ Other
Describe Other PID

Monitoring equipment is to be calibrated according to manufacturer's instructions. Record measured levels in log book.

Describe method of surveillance (e.g., continuous, periodic, etc.). Indicate action levels and PPE required (total vapors, oxygen, LEL, radiation, other).

Periodic monitoring
PPE will be enforced if levels are exceeded as per MSDS information

6. PROTECTIVE CLOTHING REQUIRED? Yes (✓) No ( )

If yes, complete protective equipment form (Section 8).

7. RESPIRATORS REQUIRED? Yes ( ) No ( ) Pending actual levels

If yes, complete Section 8 and respirator log (Attachment 2).

## SECTION 5: HAZARD COMMUNICATION PROGRAM

Each chemical used at the site shall have a Material Safety Data Sheet (MSDS) and be available for review by all field personnel. The company's written HAZCOM Program shall be available at all times with the MSDS. Training shall be performed whenever a new chemical is introduced at the site. Signatures for the training shall be documented on the Daily Toolbox Meeting form.

## SECTION 6: CONFINED SPACE ENTRY

1. WILL CONFINED SPACE ENTRY TAKE PLACE? Yes ( ) No (✓)

If yes, complete Attachment 1, the Confined Space Entry Permit, prior to entering each confined space, each work shift. The Confined Space Permit must be posted outside the confined space. A copy of the company's written Confined Space Procedure is on-site with the written HAZCOM Program. (See Site Supervisor.)

## SECTION 7: SITE EMERGENCY PLAN

Your Location Adaress: 71 Forest Avenue. Glen Cove, New York

Telephone Located at: Friendly's - south side of Forest Avenue

**Emergency Phone Numbers:**

Ambulance: (911) _____

Fire: (911) _____

Police: (911) _____

Poison Control: 676-5000

Hospital: 676-5000 Community Hospital of Glen Cove

Directions: Go east on Forest Avenue. Make first right onto Walnut Road. Hospital on right one block south.

**FIRST AID**

Ingestions: Give water if patient is conscious. Call Poison Control and follow instructions. Administer CPR, if necessary. Seek medical attention.

Inhalation: Remove person from contaminated environment. Administer CPR, if necessary. Seek medical attention.

Skin Contact: Brush off dry material and remove contaminated clothing. Wash skin with soap and water. Seek medical attention if irritation develops.

Eye Contact: Flush eyes and surrounding tissue with water for 15 minutes. Seek medical attention.

* Exposure Symptoms: Headache, dizziness, nausea, drowsiness, irritation of eyes, nose, throat and breathing difficulties.

Report incident to Project Manager and Regional Health and Safety Manager after emergency procedures have been implemented.

## THE HOME OFFICE:

The following person(s) is/are available for assistance or guidance at all times and can be contacted at the Home Office during working hours at (516) 249-3150; after 5:00 p.m. as follows:

J. P. Mazzurco, Safety Manager - (914) 469-9386

Sky Pager
Numeric Message

* Dial 1-800-SKY-PAGE
  1-800-759-7243

* Enter PIN 279-9817, press #

* Enter numeric message or telephone number, press #

* Confirm message, press #

* Cancel message, press #

* For help, call SkyTel
  1-800-SKY-USER

## SECTION 8: PROTECTIVE EQUIPMENT LIST

| NAME Pending/Subject to change | MEDICAL CURRENT (DATE) | 40 HR/8 HR TRAINING (DATE) | CONSTR. TRAINING (DATE) | FIT TEST CURRENT (INCLUDE TYPE & DATE) |
|---|---|---|---|---|
| Ken Watson | Feb. 1993 | Oct. 1993 | Oct. 1993 | Smoke Test - Oct. 1993 |
| Rick Doxey | Feb. 1993 | Oct. 1993 | Oct. 1993 | Smoke Test - Oct. 1993 |
| Dawn Medaglia | Feb. 1993 | Oct. 1993 | Oct. 1993 | Smoke Test. Oct. 1993 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| TASK | RESPIRATORS & CARTRIDGE* | CLOTHING | GLOVES | BOOTS | OTHER |
|---|---|---|---|---|---|
| Drilling | C - O | | V, L | | H |
| Well Installation | C - O | | V, L | | H |
| Sampling | D | | V, L | | |
| Surveying | D | | V, L | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| RESPIRATORS | CARTRIDGE | CLOTHING | GLOVES | BOOTS | OTHER |
|---|---|---|---|---|---|
| B = SCBA | O = Organic Vapor | T = Tyvek | B = Butyl | F = Firemans | F = Face Shield |
| C = Resp. | G = Organic Vapor & Acid Gas | P = PE Tyvek | L = Latex | L = Latex | G = Goggles |
| D = N/A | A = Asbestos (HEPA) | S = Saranex | N = Neoprene | N = Neoprene | L = Glasses |
| E = Escape | P = Particulate | C = Coveralls | T = Nitrile | S = Safety | H = Hard Hat |
| | C = Combination Organic Vapor & Particulate | | V = Viton | | |

* Action levels for upgrade/downgrade < 200 ppm (STEL), no respirator

## SECTION 9: SAFE WORK PRACTICES

THE FOLLOWING WORK PRACTICES MUST BE FOLLOWED BY PERSONNEL ON-SITE

1. Smoking, eating or drinking are forbidden.
2. Ignition of flammable liquids with or through improvised heating devices (e.g., barrels) is forbidden.
3. Contact with samples, excavated materials or other contaminated materials must be minimized.
4. Do not kneel on the ground when collecting samples.
5. If drilling equipment is involved, know where the "kill switch" is.
6. All electrical equipment must be plugged into ground fault interrupter (GFI) protected outlets.

## SECTION 10: EMPLOYEE ACKNOWLEDGMENTS

I acknowledge that I have reviewed the information of this Site Safety Plan. I understand the site hazards as described and agree to comply with the contents of this plan.

| EMPLOYEE (print) | SIGNATURE | DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

ATTACHMENT I

# Confined Space Entry Permit

Space Name: _____ Entry #: _____

Purpose of Entry: _____

Entry Date(s): _____ Entry Time(s): _____ Permit Expires: _____

Attendant(s): _____ Entrants: _____ Rescue Information: _____

Phone #: _____

Exit Time(s)

| Hazards Identified | yes | no |
|---|---|---|
| Oxygen deficiency (less than 19.5% at sea level) | | |
| Flammable gases or vapors (greater than 10% of the lower flammable limit, or greater than 23.5% oxygen at sea level) | | |
| Toxic gases or vapors (greater than the permissable exposure limit) | | |
| Mechanical hazards | | |
| Electrical shock | | |
| Materials harmful to the skin | | |
| Engulfment | | |
| Configuration | | |

| Equipment (specify) | required yes | required no | check when provided |
|---|---|---|---|
| 1. Respiratory Protection | | | |
| 2. Protective Clothing/Equipment | | | |
| 3. Communication Equipment | | | |
| 4. Rescue Equipment | | | |
| 5. Ventilation | | | |
| 6. Electrical Equipment | | | |

| Hazard Controls (specify) | required yes | required no | check when provided |
|---|---|---|---|
| 1. Isolate The Space | | | |
| 2. Lockout | | | |
| 3. Clean/Purge | | | |
| 4. Ventilate | | | |
| 5. Barriers | | | |
| 6. Other | | | |

## Air Monitoring Results

Air Monitoring Equipment Used: _____

| | | | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM | Time: ___ AM PM |
|---|---|---|---|---|---|---|---|---|---|---|
| Oxygen level | min | 19.5% | | | | | | | | |
| | max | 23.5% | | | | | | | | |
| Flammability | | 10% LEL | | | | | | | | |
| $H_2S$ | | 10 ppm | | | | | | | | |
| CO | | 25 ppm | | | | | | | | |
| $SO_2$ | | 2 ppm | | | | | | | | |
| Other (specify) | | | | | | | | | | |

| Authorization of Entry Supervisor | Additional Instructions? | Additional Permits? |
|---|---|---|
| Name: _____ Date: _____ Phone #: _____ | yes ___ no ___ *If yes, list on back* | yes ___ no ___ *If yes, attach* |

# EXHIBIT I

## CONFINED SPACE SURVEY

(Prior to entering a confined space refer to 1910.146.

### GENERAL

Confined Space Location _____

No. of workers to enter _____

Expected duration of Entry _____ Actual _____

Type of work _____

### HAZARDS

| No. | | No. | |
|---|---|---|---|
| 1 | Explosive/Flam. Gases | 9 | Burns |
| 2 | Oxygen Deficiency | 10 | Noise |
| 3 | Toxic Gases | 11 | Slipping |
| 4 | Electrical Shock | 12 | Fire |
| 5 | Temperature | 13 | Biological |
| 6 | Contamination | 14 | Ergonomic |
| 7 | Energy Release | 15 | Engulfment |
| 8 | Radiation | 16 | Compression |

| No. | Control Methods |
|---|---|
| ___ | _____ |
| ___ | _____ |
| ___ | _____ |
| ___ | _____ |
| ___ | _____ |

Surrounding Area Survey

| | Hazard | Control |
|---|---|---|
| 1. | _____ | _____ |
| 2. | _____ | _____ |
| 3 | _____ | _____ |

### TESTING

| Atmospheric Testing | Level |
|---|---|
| Oxygen Def. | _____ |
| LFL | _____ |
| Hydrogen Sulfide | _____ |
| Other | _____ |

Continuous Atmospheric Testing

Equipment: _____

Tester _____

| Hazard | Freq. |
|---|---|
| 1. _____ | |
| 2. _____ | |
| 3. _____ | |
| 4. _____ | |

### REQUIRED PPE

| | |
|---|---|
| Respirator | [ ] |
| Glasses | [ ] |
| Face Shield | [ ] |
| Shoes | [ ] |
| Gloves | [ ] |
| Apron | [ ] |
| Earplugs | [ ] |

Confined Space Permit Issued [ ] Yes [ ] No

Explain _____

Signature _____ Date _____

Member
Tyree
Environmental
Technologies

# DAILY TOOLBOX SAFETY MEETING

Date: _____ Weather Temp: _____

Foreman: _____ Jobsite Location: _____

Topics of Safety Meeting:

[ ] Hardhats & Safety Shoes
[ ] Eye & Ear Protection
[ ] Work Zones & Site Control
[ ] Heat & Cold Stress
[ ] Designated Smoking Zone
[ ] Previously Occurring Accidents
[ ] Accident Reporting
[ ] Ladders for Excavations
[ ] Entering Excavations
[ ] Confined Space Entry
[ ] Ground Fault Interrupters
[ ] Location of First Aid Kit, Fire Extinguishers & Phone Numbers
[ ] HAZCOM Training
[ ] Other _____

_____

_____

_____

Signatures:

| Tyree Employees | Subcontractors & Visitors |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Notes From Daily Activities: _____

_____

_____

_____

_____

Superintendent Signature _____

safety-kleen®

# *Material Safety Data Sheet*

# *Perchloroethylene*

## *Part #'s 775, 10778, 30778*

# PERCHLOROETHYLENE

## MATERIAL SAFETY DATA SHEET FOR U.S.A. AND CANADA

## SECTION 1 -- PRODUCT INFORMATION

Safety-Kleen Corp. - 777 Big Timber Road - Elgin, IL, U.S.A. 60123
Safety-Kleen Canada Inc. - 3090 Blvd. Le Carrefour - Suite 300 - Chomedy Laval Quebec, Canada H7T 2J7
For Product Technical Information Call 312-694-2700 (U.S.A.):
800-363-2260 (Eastern Canada); 514-686-2040 (Western Provinces/Call Collect)

| *24-HOUR EMERGENCY TELEPHONE* | *MEDICAL:* | *TRANSPORTATION:* |
|---|---|---|
| These numbers are for emergency use only. If you desire non-emergency information about this product, please call a telephone number listed above. | 800-752-7869 (U.S.A.)<br>312-942-5969 (CANADA)<br>RUSH POISON CONTROL CENTER CHICAGO, ILLINOIS, U.S.A. | 708-888-4660 (U.S.A.) SAFETY-KLEEN ENVIRONMENT, HEALTH AND SAFETY DEPARTMENT<br>613-996-6666 (CANADA) CANUTEC |

| | |
|---|---|
| *IDENTITY (TRADE NAME):* | PERCHLOROETHYLENE |
| *SYNONYMS:* | TETRACHLOROETHYLENE |
| *SK PART NUMBER:* | 775, 10778, 30778 |
| *FAMILY/CHEMICAL NAME:* | CHLORINATED HYDROCARBON |
| *PRODUCT USAGE:* | DRY CLEANING SOLVENT |
| *MSDS FORM PART NO.:* | 82342 |

## SECTION 2 -- HAZARDOUS COMPONENTS

| NAME | SYNONYM | Wt. % | CAS NO. | OSHA PEL TWA ppm | OSHA PEL STEL ppm | ACGIH TLV TWA ppm | ACGIH TLV STEL ppm | LD50[a] | LC50[b] |
|---|---|---|---|---|---|---|---|---|---|
| *Perchloroethylene | Tetrachloroethylene | 99.5-100 | 127-18-4 | 25 | N.Av. | 50 | 200 | 2629 | 34200 |

N.Av. = Not Available
*See Section 10-Other Regulatory Information
[a]Oral-Rat LD50 (mg/kg)
[b]Inhalation-Rat LC50 ($mg/m^3$/8 hours)

## SECTION 3 -- PHYSICAL DATA

| | |
|---|---|
| *PHYSICAL STATE, APPEARANCE AND ODOR:* | Clear, colorless, liquid with a mild ether-like odor. |
| *ODOR THRESHOLD:* | 50ppm (For Perchloroethylene). |
| *BOILING POINT:* | 250°F (121°C) (For Perchloroethylene). |
| *VAPOR PRESSURE:* | 14mm Hg at 68°F (20°C) (For Perchloroethylene). |
| *FREEZING POINT:* | -7.6°F (-22°C) (For Perchloroethylene). |
| *EVAPORATION RATE:* | 2.8 (Butyl Acetate = 1) (For Perchloroethylene). |
| *VOLATILE:* | 100% |
| *VOLATILE ORGANIC COMPOUNDS:* | 13.5 lbs gal; 1623 g/l |
| *DENSITY:* | 13.5 lbs gal (For Perchloroethylene). |

| | |
|---|---|
| *VAPOR DENSITY:* | 5.7 (Air = 1) (For Perchloroethylene). |
| *SOLUBILITY IN WATER:* | Slight (For Perchloroethylene). |
| *pH* | 7-10 |
| *SPECIFIC GRAVITY:* | 1.623 (Water = 1) (For Perchloroethylene). |
| *COEFFICIENT OF WATER/OIL DISTRIBUTION:* | Not available. |
| *MOLECULAR WEIGHT:* | 165.8 (For Perchloroethylene). |

## SECTION 4 – FIRE AND EXPLOSION HAZARD DATA

| | |
|---|---|
| *FLASH POINT:* | Not applicable. |
| *AUTOIGNITION TEMPERATURE:* | Not applicable. |
| *CONDITIONS OF FLAMMABILITY:* | Heat, sparks and flame. |
| *FLAMMABLE LIMITS IN AIR:* | *LOWER:* Not applicable. *UPPER:* Not applicable. |
| *UNUSUAL FIRE AND EXPLOSION HAZARDS:* | Decomposition and combustion products may be toxic. Heated containers may rupture, explode or be thrown into the air. Not sensitive to mechanical impact or static discharge. |
| *EXTINGUISHING MEDIA:* | Carbon dioxide, dry chemical. |
| *FIRE FIGHTING PROCEDURES – SPECIAL:* | Perchloroethylene NFPA 704 Rating 2-0-0<br>Keep storage containers cool with water spray. Use self-contained breathing apparatus (SCBA). |
| *HAZARDOUS COMBUSTION PRODUCTS:* | Thermal decomposition and burning may produce phosgene, chloride fumes and carbon monoxide. |

## SECTION 5 – REACTIVITY DATA

| | |
|---|---|
| *STABILITY:* | Stable under normal temperatures and pressures, and not reactive with water. |
| *INCOMPATIBILITY (MATERIALS AND CONDITIONS TO AVOID):* | Avoid alkalies. May form explosive mixtures with metals and alkaline materials. |
| *HAZARDOUS POLYMERIZATION:* | Not known to occur under normal temperatures and pressures. |
| *HAZARDOUS DECOMPOSITION PRODUCTS:* | None under normal temperatures and pressures. However, thermal decomposition may produce phosgene chloride fumes and carbon monoxide. |

## SECTION 6 – HEALTH HAZARD DATA AND TOXICOLOGICAL PROPERTIES

*PRIMARY ROUTES OF EXPOSURE:* Eye and skin contact; inhalation.

*EXPOSURE LIMITS:* See Section 2.

*SIGNS AND SYMPTOMS OF EXPOSURE:*

*ACUTE:* *Eyes:* Contact may cause slight to moderate irritation.

*Skin:* Prolonged or repeated contact tends to remove skin oils, possibly leading to irritation and dermatitis. No significant skin absorption hazard.

*Inhalation (Breathing):* High concentrations of vapor or mist may be irritating to the respiratory tract, cause headaches, dizziness, nausea, impaired coordination, anesthesia and may have other central nervous system effects.

***Ingestion (Swallowing):*** May cause irritation of the throat, nausea, vomiting and symptoms of central nervous system depression. Aspiration into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

***CHRONIC:*** Repeated or prolonged exposure may cause conjunctivitis. Prolonged and/or repeated skin contact may cause drying and cracking or dermatitis. Repeated inhalation may cause respiratory tract irritation, central nervous system depression, liver and kidney damage.

***MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:*** Individuals with pre-existing skin, eye, liver, kidney, cardiovascular or central nervous system dysfunction may have increased susceptibility to the effects of exposure. Contact with skin may aggravate pre-existing dermatitis.

***CARCINOGENICITY:*** IARC classifies chemicals by their carcinogenic risk, including agents that are known, probable or possible carcinogens. NTP classifies chemicals as either known carcinogens or for which there is a limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals.

Perchloroethylene is listed by IARC as a possible carcinogen. Perchloroethylene is classified by NTP as having limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals.

Also see Section 10.

***OTHER POTENTIAL HEALTH HAZARDS:*** The following information is required by Canadian WHMIS regulations. Irritancy is covered in Signs and Symptoms of Exposure in Section 6. There is no known human sensitization. toxicologically synergistic product, reproductive toxicity, mutagenicity, or teratogenicity associated with this product.

## SECTION 7 – EMERGENCY AND FIRST AID PROCEDURES

***EYES:*** For direct contact, flush eyes with water for 15 minutes lifting upper and lower lids occasionally. If irritation or redness from exposure to vapors or mists develops, move victim away from exposure into fresh air. Consult physician if irritation or pain persists.

***SKIN:*** Remove contaminated clothing and shoes. Wash skin twice with soap and water. Consult physician if irritation or pain persists.

***INHALATION: (Breathing)*** Remove to fresh air immediately. Use oxygen if there is difficulty breathing or artificial respiration if breathing has stopped. Do not leave victim unattended. Seek immediate medical attention if necessary.

***INGESTION: (Swallowing)*** If conscious, drink 4 to 8 ounces of water and seek immediate medical attention. DO NOT induce vomiting.

## SECTION 8 – PRECAUTIONS FOR SAFE USE AND HANDLING AND PREVENTIVE MEASURES

***SPILL PROCEDURES:*** Remove all ignition sources. Ventilate area and avoid breathing vapors. For large spills, isolate area and deny entry. If possible, contain as a liquid for possible re-refining. Absorb with compatible absorbent material. Shovel into closable container for disposal. Wear protective equipment specified in Section 9. Contain away from surface waters and sewers.

***WASTE DISPOSAL METHODS:*** Dispose in accordance with federal, state, provincial and local regulations. Contact Safety-Kleen regarding recycling or proper disposal.

***HANDLING PRECAUTIONS:*** Avoid contact with eyes, skin, clothing or shoes. Use in well ventilated area and avoid breathing vapors or mists. Keep away from heat, sparks and flames.

***SHIPPING AND STORING PRECAUTIONS:*** Keep container tightly closed when not in use and during transport. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, grind or expose containers to flame or other sources of ignition. See Section 10 for Packing Group information.

***PERSONAL HYGIENE:*** Use good personal hygiene. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco products. Clean contaminated clothing, shoes and protective equipment before reuse.

## SECTION 9 -- CONTROL MEASURES AND OTHER PREVENTIVE MEASURES

| | |
|---|---|
| *EYE PROTECTION:* | Where there is likelihood of spill or splash, wear chemical goggles and faceshield. Contact lenses should not be worn. |
| *PROTECTIVE GLOVES:* | Use polyvinyl alcohol, Teflon or Viton® gloves to prevent contact with skin. |
| *RESPIRATORY PROTECTION:* | Use NIOSH/MSHA-approved respiratory protective equipment when concentration of vapors or mists exceeds applicable exposure limit. Depending on the airborne concentration, use a full-face respirator or gas mask with appropriate cartridges and canisters. A self-contained breathing apparatus (SCBA) is required for large spills and emergencies. Selection and use of respiratory protective equipment should be in accordance in the U.S.A. with OSHA General Industry Standard 29 CFR 1910.134 and in Canada with CSA Standard Z94.4-M1982. |
| *ENGINEERING CONTROLS:* | Provide local exhaust or general dilution ventilation needed to maintain concentrations of vapors or mists below applicable exposure limits. Where explosive mixtures may be present, systems safe for such locations should be used. |
| *OTHER PROTECTIVE EQUIPMENT:* | Wear appropriate solvent-resistant boots, apron or other protective clothing where spills and splashes are possible. A source of clean water should be available in work areas for flushing the eyes and skin. |

## SECTION 10 -- OTHER REGULATORY INFORMATION

| | |
|---|---|
| *DOT PROPER SHIPPING NAME:* | TETRACHLOROETHYLENE |
| *DOT CLASS:* | Class 6.1 |
| *DOT ID NUMBER:* | UN1897, Packing Group III<br>(Reportable Quantity = 100 lbs/container) |
| *SARA TITLE III:* | Product contains a toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Toxic constituent is listed with an asterisk in Section 2 of this Material Safety Data Sheet.<br><br>Product poses the following physical and/or health hazards as defined in 40 CFR 370.3 (Sections 311, 312 of SARA Title III):<br><br>Immediate (Acute) Health Hazard<br>Delayed (Chronic) Health Hazard |
| *CALIFORNIA:* | This product contains detectable amounts of Perchloroethylene CAS No. 127-18-4 and Trichloroethylene CAS No. 79-01-6. These materials are listed by the State of California as known carcinogens. |
| *TDGA:* | Tetrachloroethylene. Class 6.1, UN1897, Packing Group III |
| *WHMIS CLASSIFICATION:* | D1B (Poisonous and Infectious Materials, Immediate and Serious Toxic Effects. Toxic Material);<br>D2A (Poisonous and Infectious Materials, Other Toxic Effects, Very Toxic Material);<br>D2B (Poisonous and Infectious Materials, Other Toxic Effects. Toxic Material) |

## SECTION 11 -- PREPARATION INFORMATION

*PREPARED BY:* Product MSDS Coordinator

*REVISED:* March 20, 1991

*ORIGINAL ISSUE DATE:* July 20, 1989

*SUPERSEDES:* December 1, 1989

PPG INDUSTRIES, INC. ONE PPG PLACE PITTSBURGH, PA 15272

# * * * TRICHLOROETHYLENE

| | |
|---|---|
| MSDS NUMBER: | 0085 |
| DATE: | 07/31/90 |
| EDITION: | 011 |
| TRADE NAME: | TRICHLOROETHYLENE |
| CHEMICAL NAME/SYNONYMS: | TRICHLOROETHENE, TRICHLORETHYLENE, TRICHLOR |
| CHEMICAL FAMILY: | HALOGENATED HYDROCARBONS |
| FORMULA: | CHCL=CCL2 CAS NUMBER: 000079 01 6 |
| U.S. DOT SHIPPING NAME: | TRICHLOROETHYLENE |
| U.S. DOT HAZARD CLASS: | ORM-A |
| SUBSIDIARY RISK: | N/A |
| I.D. NUMBER: | UN1710 |
| REPORTABLE QUANTITY: | 100 LBS/45.4 KG |

## SECTION 1 * PHYSICAL DATA

| | |
|---|---|
| BOILING POINT @ 760 MM HG: | 86-88 C |
| VAPOR DENSITY (AIR=1): | 4.54 |
| SPECIFIC GRAVITY (H20=1): | 1.465 @ 20/20 C |
| PH OF SOLUTIONS: | 6.7 TO 7.5 |
| FREEZING/MELTING POINT: | -86.4 C |
| SOLUBILITY (WEIGHT % IN WATER): | 0.11 |
| BULK DENSITY: | 12.2 LBS/GAL @ 20 C |
| VOLUME % VOLATILE: | 100 |
| VAPOR PRESSURE: | 57.8 MM HG @ 20 C |
| EVAPORATION RATE: | (ETHYL ETHER=1): 0.28 |
| HEAT OF SOLUTION: | N/A |

APPEARANCE AND ODOR:
CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR.

## SECTION 2 * INGREDIENTS

| MATERIAL | PERCENT |
|---|---|
| TRICHLOROETHYLENE (STABILIZED) | > 99 |

NOTE: TESTED MIXTURE

## SECTION 3 * FIRE/EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED):
NONE WHEN TESTED IN ACCORD.WITH DOT REQ.

FLAMMABLE LIMITS IN AIR (% BY VOLUME)
LEL: 7.8%
UEL: 52%

EXTINGUISHING MEDIA:
WATER, DRY CHEMICALS OR CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES:
FIRE FIGHTERS SHOULD WEAR NIOSH/MSHA APPROVED PRESSURE DEMAND, SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
VAPORS CONCENTRATED IN A CONFINED OR POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK,FLAME,OR HIGH INTENSITY SOURCE OF HEAT. THIS CAN OCCUR AT CONCENTRATIONS RANGING BETWEEN 7.8-52% BY VOL. DECOMPOSITION OR BURNING CAN PRODUCE HYDROGEN CHLORIDE OR POSSIBLE TRACES OF PHOSGENE.

---

## SECTION 4 * HEALTH HAZARD DATA

TOXICITY DATA:

| | |
|---|---|
| LC50 INHALATION: | LCLO(RATS) 8000 PPM/4 HOUR |
| LD50 DERMAL: | NOT DETERMINED |
| SKIN/EYE IRRITATION: | SEE SECTION 5 |
| LD50 INGESTION: | (RAT) 4900-7000 MG/KG |
| FISH,LC50 (LETHAL CONCENTRATION): | SEE SECTION 5 |

CLASSIFICATION: (POISON, IRRITANT, ETC.)

| | |
|---|---|
| INHALATION: | SLIGHTLY TOXIC |
| SKIN: | NOT DETERMINED |
| SKIN/EYE: | SKIN-MILDLY IRRITATING/EYE-IRRITANT |
| INGESTION: | SLIGHTLY TO MODERATELY TOXIC |
| AQUATIC: | SEE SECTION 5 |

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## SECTION 5 * EFFECTS OF OVEREXPOSURE

THIS SECTION COVERS EFFECTS OF OVEREXPOSURE FOR INHALATION, EYE/SKIN CONTACT, INGESTION AND OTHER TYPES OF OVEREXPOSURE INFORMATION IN THE ORDER OF THE MOST HAZARDOUS AND THE MOST LIKELY ROUTE OF OVEREXPOSURE.

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IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN?
NTP - NO IARC - NO OSHA - NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
NONE KNOWN

PERMISSIBLE EXPOSURE LIMITS:
OSHA: 50 PPM, 8-HOUR TWA (TIME WEIGHTED AVERAGE); 200 PPM, 15-MINUTE STEL (SHORT-TERM EXPOSURE LIMIT); 29 CFR 1910.1000, TABLE 2.2, REV. 3/1/89.

ACUTE:

INHALATION: TRICHLOROETHYLENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT WHICH CAN CAUSE IRRITATION OF THE RESPIRATORY TRACT, DIZZINESS, NAUSEA, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE, UNCONSCIOUSNESS AND DEATH IN CONFINED OR POORLY VENTILATED AREAS. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION RESULTING IN CARDIAC FAILURES.

EYE/SKIN: LIQUID SPLASHED IN THE EYE CAN RESULT IN DISCOMFORT, PAIN AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, AND SKIN ABSORPTION CAN OCCUR.

INGESTION: SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION.

CHRONIC:
PROLONGED EXPOSURE ABOVE THE OSHA PERMISSIBLE LIMITS MAY RESULT IN LIVER AND KIDNEY DAMAGE. TRICHLOROETHYLENE HAS BEEN EXTENSIVELY STUDIED FOR CHRONIC EFFECTS IN ANIMALS. WHILE THERE ARE STUDIES IN WHICH TUMORS WERE INDUCED IN MICE, THERE IS NO EVIDENCE THAT TRICHLOROETHYLENE POSES A CARCINOGENIC RISK TO HUMANS. TRICHLOROETHYLENE IS LISTED IN GROUP 3 BY IARC AND IS NOT LISTED BY NTP OR OSHA.

TOXICITY DATA - AQUATIC DATA:
SHEEPSHEAD MINNOWS - 96-HOUR LC50 - 52 MG/L - SLIGHTLY TOXIC
MYSID SHRIMP - 96-HOUR LC50 - 14 MG/L - SLIGHTLY TOXIC
MARINE ALGA - 96-HOUR EC50 - 95 MG/L -SLIGHTLY TOXIC

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## * EMERGENCY AND FIRST AID PROCEDURES

**INHALATION:**

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

**EYE OR SKIN CONTACT:**

FLUSH EYES AND SKIN WITH PLENTY OF WATER (SOAP AND WATER FOR SKIN) FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, CONSULT A PHYSICIAN. THOROUGHLY CLEAN CONTAMINATED CLOTHING AND SHOES BEFORE REUSE OR DISCARD.

**INGESTION:**

IF CONSCIOUS: DRINK LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING. TAKE IMMEDIATELY TO A HOSPITAL OR PHYSICIAN.
IF UNCONSCIOUS: OR IN CONVULSIONS, TAKE IMMEDIATELY TO A HOSPITAL. DO NOT ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

**NOTES TO PHYSICIAN (INCLUDING ANTIDOTES):**

NEVER ADMINISTER ADRENALINE FOLLOWING TRICHLOROETHYLENE OVEREXPOSURE. INCREASED SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE TO TRICHLOROETHYLENE.

## SECTION 6 * REACTIVITY DATA

**STABILITY:** STABLE.

CONDITIONS TO AVOID: AVOID OPEN FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS.

**HAZARDOUS POLYMERIZATION:** WILL NOT OCCUR.

CONDITIONS TO AVOID: NONE.

**INCOMPATIBILITY (MATERIALS TO AVOID):**

AVOID CONTAMINATION WITH CAUSTIC SODA, CAUSTIC POTASH OR OXIDIZING MATERIALS. SHOCK SENSITIVE COMPOUNDS MAY BE FORMED.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

## SECTION 7 * SPILL OR LEAK PROCEDURES

**STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED:**

IMMEDIATELY EVACUATE THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED

PERSONNEL SHOULD MOVE UPWIND OF SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE PROTECTION (SEE SECTION 8) SHOULD BE PERMITTED IN AREA. DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIALS ON ADSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF SPILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH, GRAVEL, ETC. AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD:

CONTAMINATED SAWDUST, VERMICULITE OR POROUS SURFACE MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE TREATED IN A PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN WHEN USING OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO PREVENT ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE CHEMICAL MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR ACT, THE CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS WELL AS ANY OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING DISPOSAL.

---

## SECTION 8 * SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

USE A HALF OR FULL FACEPIECE ORGANIC VAPOR CHEMICAL CARTRIDGE OR CANISTER RESPIRATOR WHEN CONCENTRATIONS EXCEED THE PERMISSIBLE LIMITS. USE SELF-CONTAINED BREATHING APPARATUS (SCBA) OR FULL FACEPIECE AIRLINE RESPIRATOR WITH AUXILIARY SCBA OPERATED IN THE PRESSURE-DEMAND MODE FOR EMERGENCIES AND FOR ALL WORK PERFORMED IN STORAGE VESSELS, POORLY VENTILATED ROOMS, AND OTHER CONFINED AREAS. RESPIRATORS MUST BE APPROVED BY NIOSH/MSHA. THE RESPIRATOR USE LIMITATIONS MADE BY NIOSH/MSHA AND BY THE MANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST BE IN ACCORDANCE WITH 29 CFR 1910.134.

VENTILATION(TYPE):

USE LOCAL EXHAUST OR DILUTION VENTILATION AS APPROPRIATE TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

EYE PROTECTION:

SPLASHPROOF GOGGLES

GLOVES:

VITON(R), SILVER SHIELD(R),
POLYVINYL ALCOHOL (DEGRADES IN WATER).

OTHER PROTECTIVE EQUIPMENT:

BOOTS, APRONS, OR CHEMICAL SUITS SHOULD BE USED WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE CLOTHING AND USE OF EQUIPMENT MUST BE IN

ACCORDANCE WITH 29 CFR 1910.132 AND 29 CFR 1910.133.

## SECTION 9 * SPECIAL PRECAUTIONS

**PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:**

* DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER RESPIRATORY PROTECTION (SEE SECTION 8).
* TRICHLOROETHYLENE VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN LOW AREAS.
* KEEP CONTAINER CLOSED WHEN NOT IN USE.
* STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.
* LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRICHLOROETHYLENE.
* THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE GAS AND TRACES OF PHOSGENE.
* AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.
* A CHLORINATED SOLVENT USED AS A FLASHPOINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASHPOINT LOWER THAN THE FLAMMABLE COMPONENT.
* DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED TRICHLOROETHYLENE UNLESS PROPERLY PURGED AND CLEANED.

**OTHER PRECAUTIONS:**

* DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS OR DEATH. LONG-TERM OVEREXPOSURE MAY CAUSE LIVER/KIDNEY INJURY AND POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE.
* USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE TO TRICHLOR BELOW PERMISSIBLE LIMITS. OBSERVANCE OF LOWER LIMITS IS ADVISABLE (OUTLINED IN SECTION 5). EYE IRRITATION, DIZZINESS AND/OR DRUNKENNESS ARE SIGNS OF OVEREXPOSURE.
* AVOID CONTACT WITH EYES. WILL CAUSE IRRITATION AND PAIN.
* AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OR DERMATITIS.
* DO NOT SWALLOW. SWALLOWING MAY CAUSE INJURY OR DEATH.
* DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

**COMMENTS:**

TSCA - TRICHLOROETHYLENE IS ON THE TSCA INVENTORY UNDER CAS #79-01-6.

SARA TITLE III - A) 311/312 CATEGORIES - ACUTE AND CHRONIC, B) LISTED IN SECTION 313 UNDER TRICHLOROETHYLENE, C) NOT LISTED AS AN "EXTREMELY HAZARDOUS SUBSTANCE" IN SECTION 302.

CERCLA - LISTED IN TABLE 302.4 OF 40 CFR PART 302 AS A HAZARDOUS SUBSTANCE WITH A REPORTABLE QUANTITY OF 100 POUNDS. RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

RCRA - WASTE TRICHLOR AND CONTAMINATED SOILS/MATERIALS FROM SPILL CLEANUP AND U228 HAZARDOUS WASTE AS PER 40 CFR 261.33 AND MUST BE DISPOSED OF ACCORDINGLY UNDER RCRA. SEE 40 CFR 261.33(C) AND 261.7(B)(3) FOR CLEANING REQUIREMENTS FOR EMPTY CONTAINERS.

CALIFORNIA PROP. 65 - THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

NEW JERSEY RIGHT-TO-KNOW - ALSO CONTAINS BUTYLENE OXIDE (CAS NO. 106-88-7)

CANADIAN WHMIS - A) SENSITIZATION TO PRODUCT: NONE KNOWN, B) REPRODUCTIVE TOXICITY: NONE KNOWN, C) ODOR THRESHOLD: NOT KNOWN, D) PRODUCT USE: DEGREASING SOLVENT, E) REQUIRES POISON SYMBOL (CLASS D.1), PLUS ST. ANDREW'S CROSS.

R. KENNETH LEE
MANAGER, PRODUCT SAFETY