SITE CHARACTERIZATION WORK PLAN

for
FORMER ZOE CHEMICAL
1801 FALMOUTH AVENUE
New Hyde Park, NY 11040

NYSDEC SITE #130211

January 2013

Prepared for:

SEABOARD ESTATES, INC.
c/o BEVERIDGE & DIAMOND, LLC
477 Madison Avenue, 15th Floor
New York, NY 10022-5802

Prepared by:

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17 Dupont Street
Plainview, NY 11803-1614

January 21, 2013

NYSDEC
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7015

Attention: Brian Jankauskas, P.E.

Re: **SITE CHARACTERIZATION WORK PLAN**
NYSDEC Site # 130211
Former Zoe Chemical
1801 Falmouth Avenue
New Hyde Park, New York

Dear Mr. Jankauskas:

On behalf of the Seaboard Estates, Inc., CA RICH Consultants, Inc. is pleased to submit the attached Site Characterization Work Plan for the above-referenced property. A complete electronic copy of this report is included on a CD in the rear cover of the hard copy.

We look forward to moving ahead with the investigation activities under the oversight of the New York State Department of Environmental Conservation. If you have any questions or comments, please give us a call at your earliest convenience.

Sincerely,

CA RICH CONSULTANTS, INC.

Jessica Proscia

Jessica Proscia
Project Environmental Scientist

Reviewed by:

Eric Weinstock

Eric A. Weinstock, CPG
Vice President

Former Zoe Chemical
1801 Falmouth Avenue
New Hyde Park, NY
NYSDEC Site # 130211

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1801 FALMOUTH AVENUE

NEW HYDE PARK, NEW YORK

SITE # 130211

1.0 INTRODUCTION AND PURPOSE

The following Site Characterization Work Plan (SCWP) was prepared by CA RICH Consultants, Inc. (CA RICH) of Plainview, New York, on behalf of the owner Seaboard Estates, Inc. for the above-referenced property (hereinafter referred to as "the Site"). This SCWP was prepared in response to the need for further on-site investigation activities at the Site and is based upon the guidelines set forth in NYSDEC's DER-10 Technical Guidance for Site Investigations and Remediation (Ref. 1). The proposed scope of work presented in this SCWP will be conducted in accordance with the Quality Assurance Project Plan (Appendix A) and Health & Safety Plan prepared for this Site (Appendix B). Based on information already obtained during previous environmental investigations near the Site, the contaminants of concern are 1,1,1-trichloroethane (TCA) and its degradation products.

This Work Plan addresses the investigation activities to be completed as a further characterization and follow-up investigation with regards the presence of TCA in the groundwater beneath the Site. To summarize, between February 2010 and May 2011, NYSDEC contracted the services of MACTEC Engineering and Consulting, P.C. (MACTEC) to investigate possible sources of perchloroethene (PCE) and trichloroethene (TCE) groundwater contamination that have impacted two municipal supply wells in New Hyde Park, NY. These wells, identified as N-7649 and N-7650, are approximately 1-½ miles southwest and hydraulically downgradient of the Site. The work performed is summarized in the following reports: Site Characterization Report – Final (Ref.2); Site Characterization: May 2011 Results (Ref.3); and Records Search and Hydrogeologic Evaluation-Final (Ref.4). During the course of this investigation, groundwater borings were installed in the sidewalk in front of the Site. The results of water samples from borings GW-05 and GW-05A displayed elevated levels of TCA and its degradation products from a depth of 20 feet to 25 feet below grade immediately downgradient of the Site.

The purpose of this SCWP is to outline the scope and protocol to be followed during; (a) the further investigation of groundwater impacts identified in the previous investigations, (b) determine if TCA and other chemicals utilized at the Site by a prior tenant identified as Zoe Chemical have been released to the environment, (c) identify any potential on-site or off-site sources of contamination, and (d) to evaluate the potential for soil vapor intrusion conditions at the Site. The NYSDEC will, in turn use this information to determine if the Site warrants listing on the NYSDEC Inactive Hazardous Site Registry.

This will be accomplished by:

1. Properly characterizing the nature and extent of on-site groundwater contaminants;
2. Identifying any potential on-site sources of the groundwater contaminants;
3. Properly characterizing the nature and extent of soil vapor, if any; and,
4. Producing data of sufficient quantity and quality to determine whether the contamination is originating from the Site or attributable to an off-site source(s).

2.0 PHYSICAL SITE CHARACTERISTICS

2.1 SITE DESCRIPTION

The Site is located at 1801 Falmouth Avenue in New Hyde Park, Nassau County, New York and is legally designated on Nassau County Tax Maps as Section: 8; Block: 189; Lots: 1 to 12, 42 to 73. The Site is approximately 88,000 square feet and is improved with a 44,800 square foot building constructed in the early 1960's. The building is serviced with a connection to the municipal sewer system. The majority of the Site is relatively flat; however, the northern boundary is sloped upward towards the Water Authority of Western Nassau County property or Evergreen Avenue. The Site is presented on a topographic map as illustrated in Figure 1A.

2.2 SITE HISTORY

According to records obtained by at the Town of North Hempstead Building Department (TNHBD) a Certificate of Occupancy was issued in December 1962 and the first tenant of the building was Zoe Chemical. Zoe Chemical utilized the Site to blend and package a number of different cleaning products until 1992. Between 1992 and 1997, the building was only partially occupied by Stoll of America, an operator of knitting machines; and Ruby's Costumes, a warehouse for Halloween costumes. In 1999, the Site was occupied by COC/Aceto (Aceto). Aceto manufactured and distributed deodorizing cakes for urinals. Aceto vacated the space in 2006. Since 2006 the building has been occupied by Stober/Probuild, a distributor of lumber and building materials. A Site Plan is included as Figure 2. A copy of supporting documents are included in Appendix C.

2.3 SURROUNDING LAND USE

This Site is situated within a well-developed, mixed-use industrial and commercial area of New Hyde Park. Surrounding property environs are comprised mostly of occupied industrial and commercial buildings with associated parking lots. Immediately northeast of the Site is an active public water supply well field owned and operated by the Water Authority of Western Nassau County. A more general property location map presented on an aerial photograph is attached as Figure 1B.

Specific neighboring property usage is outlined below:

North: Water Authority of Western Nassau County and public supply well NC-17

South: Industrial/commercial warehouse and manufacturing buildings

East: Multi-tenant industrial/commercial buildings

West: Town drainage sump

2.4 HYDROGEOLOGIC SETTING

According to maps and reports published by the United States Geological Survey (USGS) and others, the Property is underlain by unconsolidated Cretaceous to Quaternary age sand and gravel deposits that comprise Long Island's groundwater system. These hydrogeologic units consist of alternating interbedded lenses of gravel, sand, silt, and clay, which form a layered sequence of aquifers and confining units that dip gently to the south and east. The Site is situated at an elevation of approximately 90 feet above mean sea level. Site specific work conducted to date by MACTEC suggests that the water table within the Upper Glacial Aquifer is encountered at a depth of approximately 20-25 feet below land surface and groundwater flows in a southwesterly direction. The Site is situated within Long Island's Hydrogeologic Zone I, a deep recharge area.

2.5 ENVIRONMENTAL HISTORY

A Certificate of Occupancy was issued by the TNHBD on December 5, 1962. The first tenant of the building was Zoe Chemical. Zoe Chemical utilized the Site to blend and package a number of different cleaning products. Records obtained at the Nassau County Department of Health and on Sanborn Fire Insurance maps indicate that numerous storage tanks were utilized for bulk chemical storage in the interior northeast portion of the building as well as the exterior yard on the eastern portion of the Site. Other chemicals used at Zoe Chemical included caustic soda, ethylene glycol, sulfuric acid, ammonia, alcohols, petroleum, chlorinated organics, and pesticides. An inventory submitted to NCDH is included in Appendix C.

According to a building permit obtained from the Town of North Hempstead, the building was initially serviced by on-site cesspools. On June 13, 1963, The TNHBD issued a plumbing permit to connect the building to municipal sewers. However, based on the records reviewed, it appears that only the sanitary lines from the bathrooms and sinks were connected to the municipal sewers at this time and that the industrial lines remained connected to an on-site cesspool. The industrial waste lines were connected to the municipal sewer at a later date; a permit to connect was issued by the TNHBD dated June 23, 1987.

According to records located at the Nassau County Department of Health (NCDH), "drywells in the building lead to a cesspool". It is assumed that the reference to dry wells refer to interior floor drains. An inspection performed by the NCDH on October 4, 1982 identified two 500 gallon aboveground storage tanks containing TCA at the Zoe Chemical facility. Zoe Chemical applied for a NCDH Article XI

Storage Permit on April 27, 1987. On March 11, 1988, Nassau County Department of Public Works (NCDPW) observed a spill of a 'milky white substance" from the Zoe Chemical facility. Test results of the spilled material contained 72 ug/l of TCA.

On September 28, 1992, the heating oil underground storage tank at the property passed a tightness test. The tank was cleaned and abandoned in-place with inert composite on December 21, 1992. NCDH observed the abandonment and no further action was required.

NYSDEC contracted MACTEC to investigate possible sources of PCE and TCE groundwater contamination that have impacted two municipal supply wells in New Hyde Park, NY. These wells, identified as N-7649 and N-7650, are approximately 1-½ miles southwest and hydraulically downgradient of the Site. The findings of work performed by MACTEC is summarized in the following reports: Site Characterization Report – Final; Site Characterization: May 2011 Results; and Records Search and Hydrogeologic Evaluation-Final. During the course of MACTEC's investigations, groundwater borings were installed in the sidewalk in front of the Site. The results of water samples from borings GW-05 and GW-05A displayed elevated levels of TCA and its degradation products from a depth of 20 feet to 25 feet below grade immediately downgradient of the Site. Chloroethane was also detected in soil vapor sample SV-05 at 100,000 ug/m3. A Site Plan and Locations of Previous Environmental Samples Collected by Others is included as Figure 2.

Based on the information outlined above, the main contaminant of concern is TCA and its degradation products. The primary source suspected for a possible release is the former cesspool(s) that serviced the building prior to Zoe Chemical's connection to municipal sewers in June 1987. The most likely location of a former cesspool(s) is beneath the eastern exterior parking and storage area.

3.0 SITE CHARACTERIZATION INVESTIGATION

Following are the planned elements of the site characterization investigation. All on-site work will need to be performed in coordination with the Site's lessee and tenant, which is an operating building materials supplier using the entire Site. Coordination with the tenant may affect the timing and location of work items discussed here, and may impact the overall schedule of the investigation. Any substantive changes to this work plan that may need to be made as a result of coordination with the tenant's operations will be discussed with NYSDEC prior to implementation. All horizontal sample locations will be obtained using a handheld GPS for use in completing the EDD submission.

3.1 OBJECTIVES

The general scope of the investigation will include vertical profiling of 100-foot deep groundwater borings, the installation and sampling of shallow groundwater wells, the collection of soil and soil vapor samples at the Site as well as a ground penetrating radar survey. The objective of the Site Characterization Investigation activities is to:

1) Determine if any former sanitary leaching pools or underground storage tanks associated with the former Zoe Chemical facility remain beneath the Site;
2) Determine the nature and extent of soil and groundwater contamination at the Site;
3) Determine the potential for soil vapor intrusion at the Site.

3.2 INFORMATION GATHERING

As part of the preparation of this SCWP, CA RICH visited the TNHBD and NCDH to review their files for 1801 Falmouth Avenue and the Former Zoe Chemical facility. The findings of our records search were discussed in Section 2.6. Based on discussions during the Site meeting with NYSDEC and information obtained from the Town of North Hempstead Building Department and Nassau County Health Department, CA RICH has prepared this SCWP detailing our methods of investigation at the Former Zoe Chemical facility.

3.3 UTILITY CLEARANCE

A mark-out of underground utility lines will be performed prior to the start of fieldwork by calling the Long Island One-Call Center at (800) 272-4480. A utility mark-out verification reference number for the Site will be obtained. In addition, CA RICH will review any private surveys or Site Plans that are made available by the Seaboard Estates, Inc.

3.4 GEOPHYSICAL SURVEY

A geophysical and Ground Penetrating Radar (GPR) survey will be conducted in the approximately 16,000 square foot exterior storage/parking area on the eastern portion of the Site as well as inside the building to trace former drain lines located along the buildings' northern wall and to investigate piping within a restored trench in the southeastern portion of the warehouse. The purpose of the interior investigation will be to delineate former and current drain lines and pipes to determine if they are connected to the municipal sewer system or if they are connected to a former on-site leaching pool. The purpose of the exterior investigation will be to identify the location of an abandoned underground oil tank, and any other below ground tanks or leaching structures associated with the former Zoe Chemical operations.

Our approach will be to employ metal detector, GPR, and utility locating instruments. The metal detector will be carried over the areas of investigation in a series of closely spaced (approximately overlapping) traverse to look for metallic piping, cesspools and Underground Storage Tanks (USTs). Metal detector anomalies and potential locations of interest identified on Figure 2 will be marked out on the ground and further investigated using bidirectional GPR data profiles to more fully characterize their sources. If subsurface features such as underground storage tanks or former sanitary systems are revealed during the geophysical survey we will contact NYSDEC to discuss adjustments to the proposed scope of subsurface soil testing detailed in Section 3.8. Detected features will be marked on the ground surface using the American Public Works Association color code system.

Since the exterior yard is utilized for lumber storage it will be necessary to scan the area in two separate events. We will need to coordinate with the tenant to move the building material from approximately 50% of the Site on the first day and the second half of the Site on the second day to complete the proposed scope of work. In addition, electromagnetic utility-locating instruments will be utilized to delineate the location of any detectable subsurface utilities in the vicinity of 14 exterior drilling locations. A drawing depicting the proposed area for the geophysical survey is included as Figure 3.

3.5 INSTALLATION, DEVELOPMENT, SAMPLING, ANALYSIS, AND SURVEY OF PERMANENT GROUNDWATER MONITORING WELLS

Four permanent groundwater monitoring wells will be installed utilizing a Geoprobe drill rig to the shallow water table to determine the depth to groundwater and direction of groundwater flow as well as the quality of the uppermost groundwater presently occurring beneath the Site. As the depth to shallow groundwater is estimated to be 20 feet below grade, the shallow wells will be installed to a depth of 30 feet below grade or 10 feet through the shallow groundwater table into the uppermost zone of saturation. During drilling soil samples will be continuously collected and examined for evidence of contamination with a Photo-Ionization Detector (PID) and for evidence of chemical staining. Well construction will consist of 15 feet of two-inch diameter pre-pack well screen and approximately 15 feet of two-inch diameter schedule 40 PVC riser. Each well will be finished with a bentonite seal, a watertight j-plug and eight-inch flush mounted well protection box. All excess drill cuttings will be drummed and sampled for proper off-site disposal. A drawing illustrating the locations of the proposed monitoring well locations is included as Figure 4.

Immediately following installation of each well, the wells will be developed and all purge water will be containerized for proper off-site disposal. Approximately one to two weeks after well development, a groundwater sample will be collected from each well utilizing low-flow sampling technology and the elevations of the top of the well casings will be surveyed by a NYS-Licensed Surveyor to the nearest 0.01 of a foot. All monitoring well samples will be sampled in accordance with EPA's Low-Flow (minimal drawdown) Groundwater Sampling Procedures. A copy of these are attached as Appendix D. A data logger will be placed in each well to record the depth to groundwater over a two day period and aid in the development of a groundwater contour map. In addition, the following samples will be collected for

QA/QC purposes: one trip blank, one field blank, one duplicate sample, one matrix spike and one matrix spike duplicate. Groundwater samples will be collected directly from new poly tubing into laboratory-issued containers. Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols.

Groundwater samples from each well will be analyzed for the Target Compound List (TCL) of Volatile Organic Compounds (VOCs) via EPA Method 8260C, TCL Semi-Volatile Organic Compounds (SVOCs) via EPA Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and the total and dissolved Target Analyte List (TAL) of metals via Methods SW6010 and SW7471B. All analysis will be reported using NYSDEC ASP Category B deliverables. The laboratory data will be reviewed by a qualified Data Validator and a Data Usability Summary Report (DUSR) will be prepared.

3.6 DEEP GROUNDWATER PROFILE BORINGS

Four deep groundwater profile borings shall be performed to approximately 100 feet below grade utilizing the Geoprobe drilling system. Soil samples will be continuously screened and examined for evidence of contamination with a PID and visually for evidence of chemical staining until the groundwater interface. Groundwater sample collection will commence at approximately 20-25 feet below grade at the boring by the back garage door and in the middle of the storage yard; and at 30-35 feet at the boring near the truck bay and near Evergreen Avenue. Samples will be collected using new poly tubing and a stainless steel check valve lifted up and down to achieve a flow of water. Each sample interval will be purged approximately three tubing volumes prior to sampling. Groundwater parameters (e.g., turbidity, pH, temperature, conductivity, etc.) will be obtained prior to sampling. The uppermost water samples by Evergreen Avenue and the middle of the storage yard shall be submitted for laboratory and analyzed for TCL VOCs via EPA Method 8260C, TCL SVOCs via EPA Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and the total and dissolved TAL metals via Methods SW6010 and SW7471B. The samples will be field filtered using Single Sample®, disposable groundwater filter capsule's or an equivalent field filter. The boring will then be advanced with the collection of additional samples for TCL VOCs only at 10-foot intervals until approximately 100 feet below grade. We anticipate collecting a total of 36 groundwater samples from the four profile boring locations directly from new poly tubing into laboratory-issued containers.

Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols. In addition, the following VOC samples will be collected for QA/QC purposes: two trip blanks, two field blanks, two duplicate samples, two matrix spikes and two matrix spike duplicates. One field blank, one duplicate sample, one matrix spike and one matrix spike duplicates shall be collected for SVOCs, pesticides, PCBs, total and dissolved metals. After completing the groundwater profile, the boring will be sealed from the bottom up with grout. A drawing depicting the locations of the deep groundwater borings is included as Figure 4.

3.7 SHALLOW GROUNDWATER BORINGS

Two shallow groundwater borings shall be conducted to approximately 20-25 feet below grade utilizing the Geoprobe drilling system. Soil samples will be continuously screened and examined for evidence of contamination with a PID and for evidence of chemical staining until the groundwater interface. Each sample interval will be purged approximately three tubing volumes prior to sampling. Groundwater parameters (e.g., turbidity, pH, temperature, conductivity, etc.) will be obtained prior to sampling. Groundwater sample collection will include TCL VOCs via EPA Method 8260C, TCL SVOCs via EPA Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and the total and dissolved TAL metals via Methods SW6010 and SW7471B. Groundwater samples will be collected in the same manor described in section 3.6, directly from new tubing into laboratory-issued containers. After completing the groundwater profile, the boring will be sealed from the bottom up with grout. Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols. QA/QC requirements will be combined with samples obtained from the shallow groundwater wells. A drawing depicting the locations of the shallow groundwater borings is included as Figure 4.

3.8 EXTERIOR SOIL BORINGS

Seven exterior soil borings shall be advanced until shallow groundwater is encountered approximately 20-feet below grade utilizing the Geoprobe drilling system. Soil samples will be continuously screened and examined for evidence of contamination with a PID and for evidence of chemical staining until the groundwater interface. The soil sample from the uppermost soil or the sample displaying the highest PID reading or evidence of staining will be submitted for laboratory analysis. Borings will be filled with sand and covered with similar pavement. The testing parameters will include TCL VOCs via EPA Method 8260C, TCL SVOCs via EPA Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and total TAL metals via Methods SW6010 and SW7471B. VOC samples will be placed into laboratory-issued2 oz. bottles using a new wood tongue depressor or similar instrument until the sample bottle is filled. Samples will be collected by utilizing Geoprobe's, direct push macro core sample sleeves. Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols. In addition the following QA/QC samples will be collected during the soil sampling event: one trip blank, one field blank, one duplicate sample, one matrix spike and one matrix spike duplicate. A drawing depicting the locations of the soil borings is included as Figure 4.

3.9 INTERIOR SOIL BORINGS

Four shallow interior soil borings shall be advanced to approximately four to five feet below grade utilizing the Geoprobe drilling system in the former tank storage area located in the northeastern portion of the warehouse and the former flammable storage room. Sub-slab soil samples will be screened at all four locations and examined for evidence of contamination with a PID and for evidence of chemical staining. If no contamination is observed a soil sample will be obtained in the same manor described in section 3.8 from only one boring to document sub-slab soil conditions. If contamination is observed, a soil sample will be obtained from the boring and a soil vapor point will be installed as a follow-up measure. A fifth soil boring will be conducted adjacent to the former drain lines identified along the northern wall of the warehouse. The boring will be advanced five feet below grade with the collection of a soil sample for chemical analysis. Borings will be filled with sand and covered with concrete. The testing parameters will include TCL VOCs via EPA Method 8260C, TCL SVOCs via EPA

Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and total TAL metals via Methods SW6010 and SW7471B. Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols. QA/QC requirements will be combined with samples obtained from the exterior soil borings. A drawing depicting the locations of the shallow interior soil borings is included as Figure 4.

3.10 STORM DRAINS

Two exterior storm drains located near the garage door on the eastside of the building will be accessed to determine if they are connected to the municipal sewer system or if they contain sediment bottoms that drain to the earth. During the geophysical investigation the area surrounding the storm drains will be scanned for the presence of subsurface piping. The cover to each drain will be removed and a soil sample will be collected from each drain for chemical analysis by advancing a hand-operated stainless steel auger in the soil at the bottom of the drain. The testing parameters will include TCL VOCs via EPA Method 8260C, TCL SVOCs via EPA Method 8270, pesticides via EPA Method 8081, PCBs via EPA Method 8082, and total TAL metals via Methods SW6010 and SW7471B. Samples will be stored on ice pending shipment to a New York State ELAP certified laboratory. All samples will be uniquely identified and all information associated with the samples will be recorded utilizing standard chain-of-custody sampling protocols. QA/QC requirements will be combined with samples obtained from the exterior soil borings. The locations of the storm drains are depicted on Figure 2.

3.11 SOIL VAPOR AND INDOOR AIR TESTING

Four exterior soil vapor points shall be installed to eight feet below grade in the eastern parking and lumber storage area using a Geoprobe™. The points shall be constructed of a stainless steel screen connected to stainless steel ¼-inch tubing. The annular space around the screened zone shall be filled with No. 2 Morie sand. Prior to sampling approximately three tubing volumes will be purged from each exterior soil vapor point. Assuming eight feet of stainless tubing and three feet of Tygon tubing, eleven feet of tubing will be purged. As the tubing has a volume of 28mils per foot, 308mils will be purged prior to sampling. An SKC Pocket Pump™ which includes both a flow meter and a flow totalizer will be used to assure that the purge rate does not exceed 0.2 liters per minute, and that the required volume is purged from the sample point. In addition, four interior sub-slab soil vapor points will be installed inside the

warehouse. The sub-slab vapor, indoor air and ambient air samples will be collected before the soil borings are performed in the building. The interior points will be installed just beneath the bottom of the concrete building slab using a hand-held hammer drill with a 1-inch diameter bit. The points shall be constructed of a stainless steel screen connected to stainless steel ¼-inch tubing and completed with a surface seal consisting of beeswax. The points will be completed with temporary caps and will be removed after the testing is completed. During the installation of each point, soil samples will be collected with a 1-inch diameter sampler and screened for evidence of contamination with a PID. Borings will be filled with sand and covered with concrete. Prior to sampling approximately three tubing volumes will be purged from each interior sub-slab soil vapor point. Assuming five inches of stainless tubing and three feet of Tygon tubing, three feet and five inches of tubing will be purged. As the tubing has a volume of 28mils per foot, 96mils will be purged prior to sampling. An SKC Pocket Pump™ which includes both a flow meter and a flow totalizer will be used to assure that the purge rate does not exceed 0.2 liters per minute, and that the required volume is purged from the sample point. Any soil samples displaying evidence of contamination will be discussed with the NYSDEC and submitted for confirmatory laboratory analysis. The specific testing parameters will be discussed with NYSDEC to determine the proper testing parameters depending on the evidence of suspected contamination observed at the time.

After installation, the soil vapor points shall be sampled in accordance with New York State Department of Health's (NYSDOH) prevailing Guidance for Evaluating Soil Vapor Intrusion in the State of New York dated October 2006 (Ref.5), including any updates or subsequent guidance issued by NYSDOH during the performance of our work. In addition, the soil vapor samples shall be chemically analyzed using the procedures and protocols described in the Sampling, Sample Preparation, and Analysis Requirements of EPA Compendium Method T0-15. A three-way "T" connector valve assembly will be connected to a vacuum pump and a pre-cleaned six-liter SUMMA® air sampling canister. Prior to collecting the soil vapor samples, the sample tubing shall be purged using a vacuum pump set at a rate of approximately 0.2 liters per minute. A helium tracer gas will be used to enrich the atmosphere around the sampling location. The tracer gas verifies that interior ambient air is not inadvertently drawn down into the soil vapor sample. Both the purge volume from the sampling tube and the helium-enriched air within the container will be screened for the tracer gas using a Gowmac® Model 21-250, or equivalent, gas leak detector.

Following the purging and tracer gas verification steps, the soil vapor samples will be collected using the SUMMA® canister set to fill at a rate of not more than 0.2 liters per minute with an approximate fill time of 2-hours. The samples will be analyzed for VOCs using USEPA Method T0-15 by a NYS-certified laboratory. Soil vapor point installation logs will be generated and will be included as an appendix in the Site Characterization Report. The logs will contain any local condition(s) that occurred during the sampling that may influence interpretation of the results (i.e. weather).

Concurrent with the interior sub-slab vapor testing, one indoor air sample and one ambient air sample will be obtained from either a closed room or the showroom for comparison purposes to evaluate vapor intrusion in accordance with NYSDOH guidelines. An inventory of chemicals used at the facility will also be prepared. Each indoor air and ambient air stainless steel sampling canister required by Method T0-15 shall be specially pre-calibrated and prepared at a New York State-certified laboratory, as subcontracted to CA RICH, to collect six liters of air for chemical analyses with an 8-hour fill time. One field duplicate will be collected for QA/QC purposes.

All sample analyses will be reported using NYSDEC ASP Category B deliverables. The laboratory data will be reviewed by a qualified Data Validator and a DUSR will be prepared. A drawing depicting the locations of the soil vapor samples is included as Figure 4.

3.12 Equipment Decontamination

An equipment decontamination area will be set up in a location close to but segregated from the work area. This area will be set up on top of a minimum 6-mil polyethylene liner (or equivalent quality plastic sheeting), and will include the following equipment: decontaminating cleaners and solutions, deionized water, sprayers, washing tubs, brushes and clean disposable latex and/or neoprene gloves. Gloves worn for sample handling will be discarded between sample collections.

All down-hole drilling equipment will be decontaminated prior to its arrival at the Site and between each use, e.g., samplers, rods, augers and plugs, etc. All re-usable sampling equipment, including bowls, trowels, and split-spoon samplers, etc. will be decontaminated with a three-step washing process that

consists of a tap water rinse, an Alconox® and tap water wash, followed by a tap water rinse. After each rinsing process the equipment will be allowed to air dry.

The submersible pump used for groundwater sample collection will be decontaminated between sample collection by passing the detergent and water mixture through the pump, followed by two fresh water rinses. All on-site sampling equipment will be decontaminated between each use in the following manner: laboratory grade detergent and fresh water wash using scrub brush, followed by two fresh water rinses and final air dry. Decontaminated sampling equipment will then be wrapped in clean (unused) aluminum foil pending use for sample collection. The submersible pump used for groundwater sample collection will be decontaminated between sample collection by passing the detergent and water mixture through the pump, followed by two fresh water rinses. Gloves worn for sample handling will be discarded between sample collections. If visual contamination remains, new sampling equipment will be obtained or decontaminated procedures will be modified.

3.13 Sampling QA/QC Protocol

Field notes including observations of soil conditions, pertinent observations, diagrams (if appropriate) will be maintained. Appropriate photographs will be taken. A record of each sample, including any pertinent observations about the sample, will be kept in a field notebook and/or appropriate logs and copies will be included within the Site Characterization Report. Dedicated, new polyethylene tubing will be used at each groundwater sampling location for purging and sampling. A new disposable sterile wooden tongue depressor will be used for each soil sample collection and discarded after each use.

Samples will be packaged in laboratory-issued sample containers by CA RICH personnel and stored on ice pending shipment to CA RICH's subcontracted State-Certified laboratory. Soil samples for VOCs will be packaged in three, two ounce unpreserved volatile organic jars. Special care is taken to completely fill the jars so that no head space remains after they are sealed, thus minimizing the loss of volatile organic compounds present in the sample. Groundwater samples will be collected directly from the decontaminated sampling pump into laboratory-issued containers. The VOC vials will be filled completely and checked to ensure no air bubbles are present. Additional field and laboratory QA/QC protocol is included in the associated Quality Assurance Project Plan (QAPP), which is included as Appendix A.

3.14 Health & Safety

A site-specific Health and Safety Plan (HASP) has been prepared for the field portion of the Site Investigation. The HASP will cover all activities in the 'investigation area', as well as emergency procedures and available emergency services in proximity to the Site. All proposed work discussed in this SCWP will be conducted in accordance with the HASP. The HASP is included as Appendix B.

3.15 Site Characterization Report

Once the laboratory results are obtained, a Site Characterization Report will be prepared for NYSDEC in accordance with DER-10. At a minimum, the Site Characterization Report will include the following items:

- A description of the work performed and findings;
- Well and soil vapor point construction details;
- Boring logs;
- Soil vapor data summary tables with a comparison to NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. (Ref. 5);
- Soil data summary tables with a comparison to NYSDEC Part 375 Unrestricted and Commercial Use Standards (Ref. 6);
- Groundwater data summary tables with a comparison to NYSDEC Technical and Operation Guidance Series Class GA Groundwater Guidance Values (Ref. 7);
- Sample location maps;
- Qualitative Exposure Assessment;
- Copies of Manifests documenting disposal activities;
- A Data Usability Summary Report including the laboratory data;
- A water table elevation and contour map;
- EDD submission
- Conclusions and Recommendations.

4.0 SCHEDULE

The following Schedule is provided for this Site Characterization Investigation.

Event	Schedule
Draft Site Characterization Work Plan and HASP Submission	June 2012
NYSDEC Review Period (Estimated)	December 2012
Final Site Characterization Work Plan and HASP Submission	January 2013
NYSDEC Review Period (Estimated)	February 2013
Geophysical Survey	March 2013
Groundwater Well Installation and Sampling	April 2013
On-site soil, soil vapor and groundwater testing	May 2013 to June 2013
Chemical Analysis and DUSR	June 2013/July 2013
Site Characterization Report	August/Sept. 2014

5.0 REFERENCES

1. New York State Department of Environmental Conservation, May 2010, DER-10 Technical Guidance for Site Investigation and Remediation.

2. MACTEC Engineering and Consulting, P.C., May 19, 2011, Site Characterization Report - Final.

3. MACTEC Engineering and Consulting, P.C., August 2, 2011, Site Characterization: May 2011 Results.

4. MACTEC Engineering and Consulting, P.C., September 8, 2009, Records Search and Hydrogeologic Evaluation – Final (Task 2).

5. New York State Department of Health, October 2006, "Guidance for Evaluating Soil Vapor Intrusion in the State of New York".

6. New York State Department of Environmental Conservation, Dec. 14, 2006. 6 NYCRR Part 375 Environmental Remediation Programs, Soil Cleanup Objectives & Cleanup Levels.

7. New York State Department of Environmental Conservation, October 22, 1993, Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.

8. EPA Region 1. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells. January 2010.

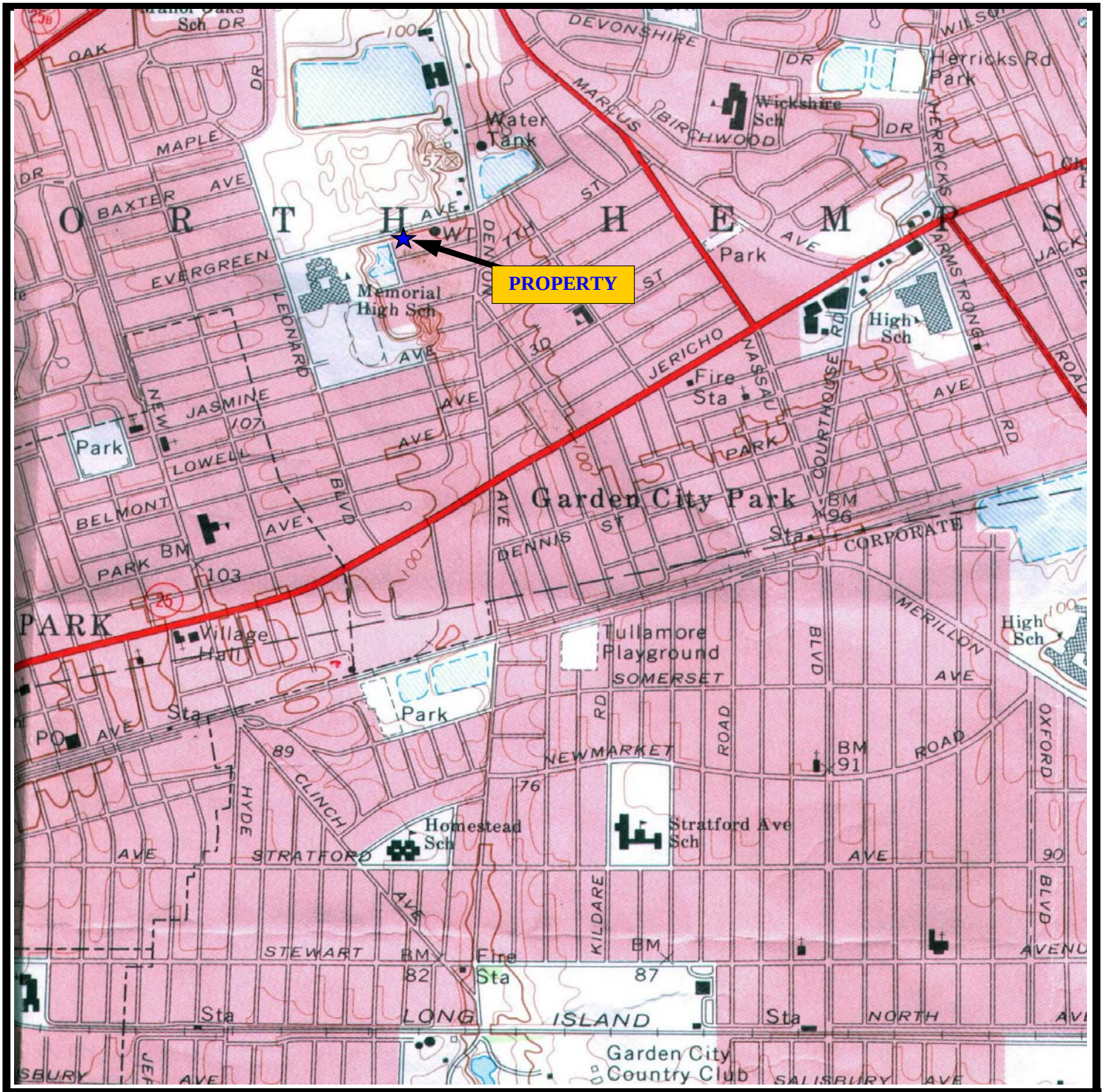
TABLE

TABLE 1
Sample Contaner Details for Soil, Groundwater and Soil Vapor Samples
Former Zoe Chemical
1801 Falmouth Avenue
New Hyde Park, NY
NYSDEC Site #130211

Sample Type, Matrix and Parameters	Number Samples	Container / Preservative	Number of QA/QA Samples				Holding Time*
			MS/MSD	Duplicate	Trip Blank	Field Blank	
Deep Groundwater Profiles							
VOCs (USEPA Method 8260)	36	40 ml vials / HCL / Ice	2/2	2	2	2	14 Days
SVOCs (USEPA Method 8270)	4	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
Pesticides (USEPA Method 8081)	4	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
PCBs (USEPA Method 8082)	4	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
Total Metals (SW6010/SW4771B)	4	250 ml plastic with HNO3/ ice	1/1	1	NA	1	28 Days**
Dissolved Metals (SW6010/SW4771B)	4	250 ml plastic with HNO3/ ice	NA	NA	NA	NA	28 Days**
Shallow Groundwater Wells & Borings							
VOCs (USEPA Method 8260)	6	40 ml vials / HCL / Ice	1/1	1	1	1	14 Days
SVOCs (USEPA Method 8270)	6	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
Pesticides (USEPA Method 8081)	6	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
PCBs (USEPA Method 8082)	6	1 liter amber/unpreserved/ ice	1/1	1	NA	1	7 Days
Total Metals (SW6010/SW4771B)	6	250 ml plastic with HNO3/ ice	1/1	1	NA	1	28 Days**
Dissolved Metals (SW6010/SW4771B)	6	250 ml plastic with HNO3/ ice	NA	NA	NA	NA	28 Days**
Storm Drains and Soil Borings							
VOCs (USEPA Method 8260)	11	2 oz. jar / Ice	2/2	1	1	1	14 Days
SVOCs (USEPA Method 8270)	11	8 oz. jar / Ice	1/1	1	NA	1	7 Days
Pesticides (USEPA Method 8081)	11	8 oz. jar / Ice	1/1	1	NA	1	7 Days
PCBs (USEPA Method 8082)	11	8 oz. jar / Ice	1/1	1	NA	1	7 Days
Total Metals (SW6010/SW4771B)	11	8 oz. jar / Ice	1/1	1	NA	1	28 Days**
Soil Vapor and Indoor Air							
VOCs (USEPA Method TO-15)	8	6-Liter SUMMA canister / None	NA	1	NA	NA	30 Days

* Holding time is calculated from collection date.
** The holding time for mercury is 28 days. The holding time for all other metals is 180 days.

FIGURES



APPROX. SCALE (ft.)

0 2,000 4,000

N

Adapted from 1969 USGS Lynbrook Quadrangle

CA RICH CONSULTANTS, INC.
17 Dupont Street,
Plainview, NY 11803

TITLE: **Site Location Map On Topographic Map**	DATE: **6/21/2012**
	SCALE: **AS SHOWN**
FIG- **1a**	DRAWN BY: **JP**
DRAWING:	APPR. BY: **STM**

Former Zoe Chemical
1801 Falmouth Avenue
New Hyde Park, New York

0 75 150 300

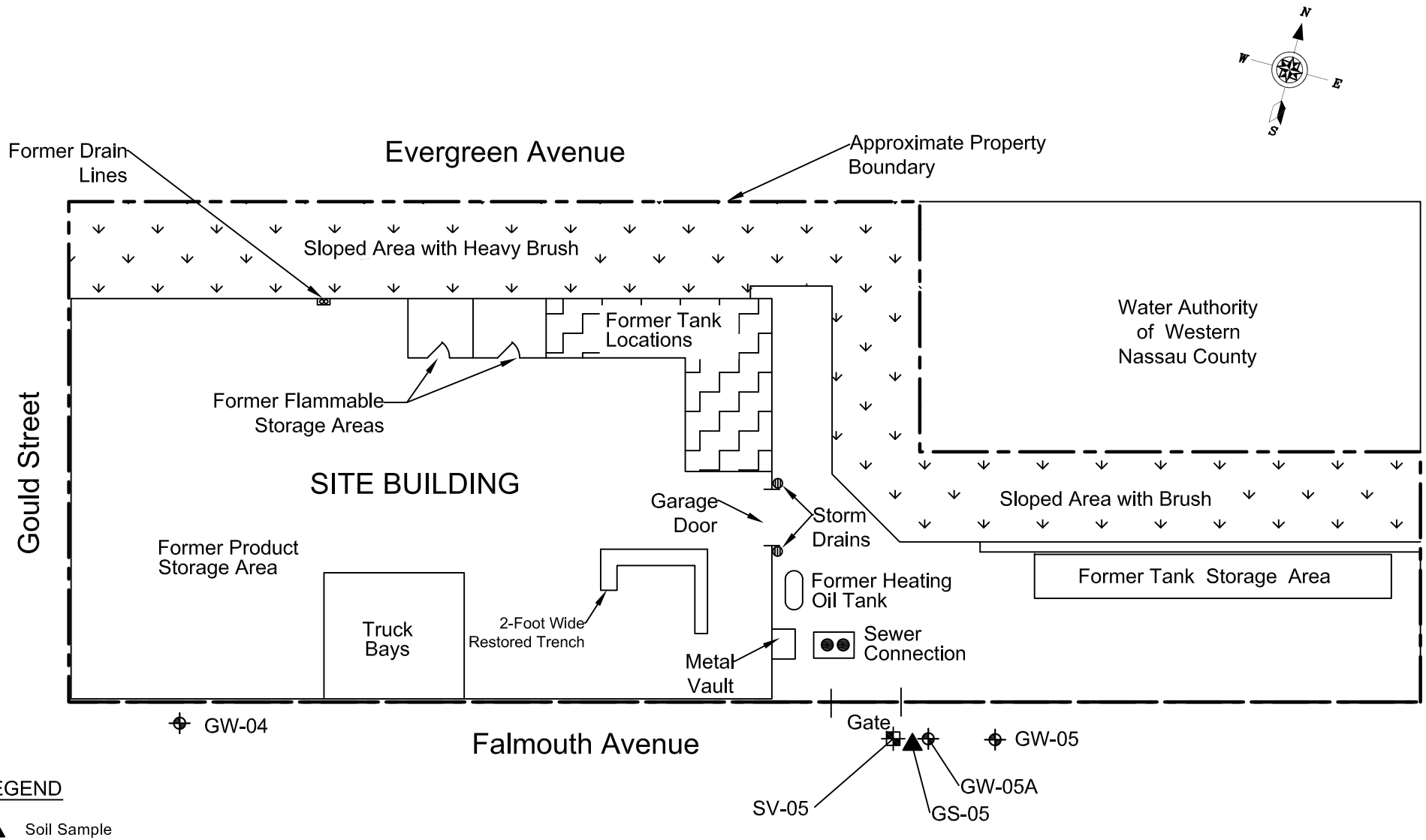
Approximate Scale In Feet

N

Aerial Photograph by Google Earth dated June 17, 2010

CA RICH CONSULTANTS, INC.
17 Dupont Street,
Plainview, NY 11803

TITLE: **Property Location Map On Aerial Photograph**		*DATE:* **6/8/12**
		SCALE: **AS SHOWN**
FIGURE: **1B**	**Former Zoe Chemical 1801 Falmouth Avenue New Hyde Park, NY**	*DRAWN BY:* **JP**
DRAWING:		*APPR. BY:* **STM**



LEGEND

- Soil Sample
- Groundwater Profile Location
- Soil Vapor Location

0 20 40 60

Graphic Scale In Feet

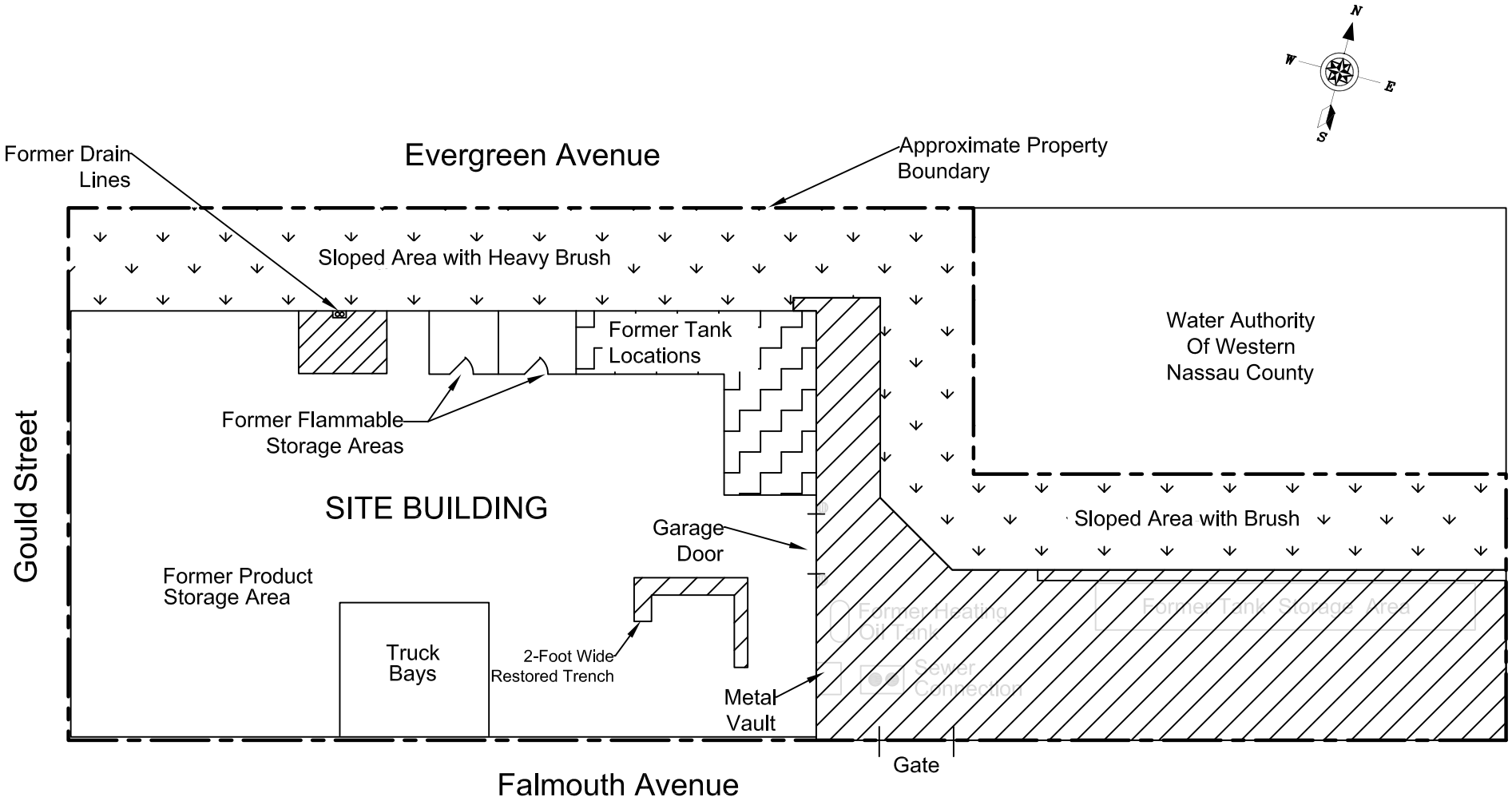
CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982

17 Dupont Street, Plainview, New York 11803

TITLE: Site Plan & Locations of Previous Environmental Samples Collected by Others		DATE: 1/2/2013
		SCALE: As Shown
FIGURE: 2	Former Zoe Chemical Site 1801 Falmouth Avenue New Hyde Park, NY	DRAWN BY: J.T.C.
DRAWING NO: 2012-1		APPR. BY: S.T.M.

H:\Drawings\Seaboard Estates-Zoe Chemical\2012-1



LEGEND

Proposed Area of Geophysical Investigation

0 20 40 60

Graphic Scale In Feet

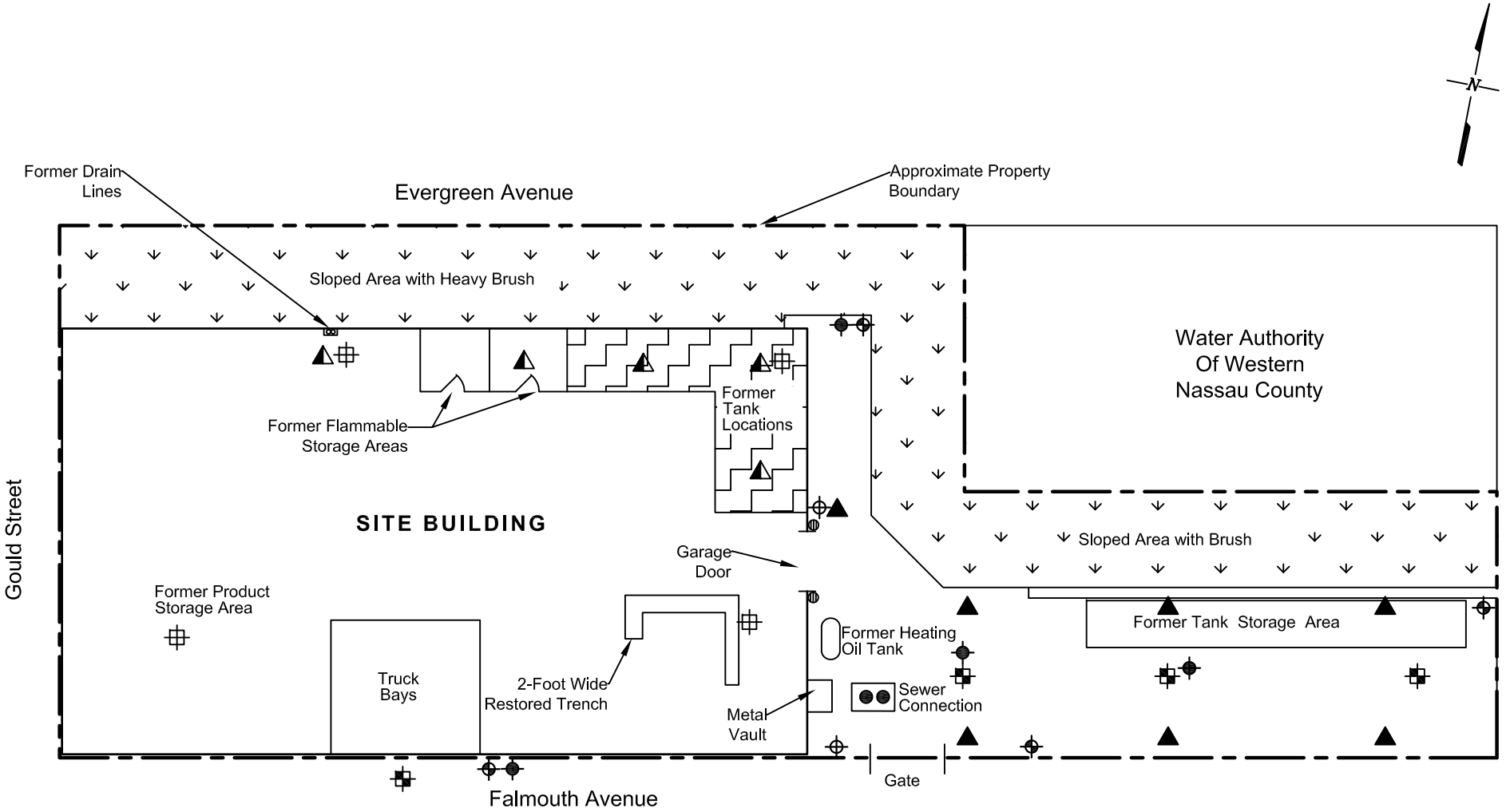
CA RICH CONSULTANTS, INC.

Environmental Specialists Since 1982

17 Dupont Street, Plainview, New York 11803

TITLE: Proposed Area of Geophysical Investigation		DATE: 6/22/12
		SCALE: As Shown
FIGURE: 3	Former Zoe Chemical Site 1801 Falmouth Avenue New Hyde Park, NY	DRAWN BY: J.T.C.
DRAWING NO: 2012-5		APPR. BY: S.T.M.

H:\Drawings\Seaboard Estates-Zoe Chemical\2012-5



LEGEND

- Proposed Exterior 20' Soil Boring
- Proposed Interior Shallow Soil Boring
- Proposed 1" Sub-Slab Soil Vapor Sample
- Proposed 8' Soil Vapor Sample
- Proposed Temporary 100' Groundwater Boring
- Proposed 30' Groundwater Monitoring Well
- Proposed Temporary 30' Groundwater Boring
- Storm Drain

0 20 40 60
Graphic Scale In Feet

CA RICH CONSULTANTS, INC.
Environmental Specialists Since 1982
17 Dupont Street, Plainview, New York 11803

TITLE: Proposed Sampling Location Map	DATE: 1/2/2013
	SCALE: As Shown
FIGURE: 4	DRAWN BY: J.T.C.
DRAWING NO: 2012-6	APPR. BY: E.A.W.

Former Zoe Chemical Site
1801 Falmouth Avenue
New Hyde Park, NY

H:\Drawings\Seaboard Estates-Zoe Chemical\2012-6

Appendix A

Quality Assurance Project Plan

QUALITY ASSURANCE PROJECT PLAN

For

SITE CHARACTERIZATION WORK PLAN

1801 Falmouth Avenue, New Hyde Park, NY
NYSDEC SITE #130211

January 2013

Prepared for:
SEABOARD ESTATES, INC.
c/o BEVERIDGE & DIAMOND, LLC
477 Madison Avenue, 15th Floor
New York, NY 10022-5802

Prepared by:

CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, NY 11803-1614

Quality Assurance Project Plan

1.1 Introduction - The following Quality Assurance Project Plan ("QAPP") has been prepared specifically for the Site Characterization Work Plan at 1801 Falmouth Avenue in New Hyde Park, New York. This Plan was prepared and approved as stated below.

Jessica Proscia

Prepared by: _____ Date: 6/21/12

Jessica Proscia, Environmental Scientist

Eric Weinstock

Approved by: _____ Date: 6/21/12

Eric Weinstock, Vice President

1.2 QAPP - Table of Contents

The following elements are included in this QAPP:

1.3 Project Description - The Site Characterization Work Plan subject to this QAPP have been prepared to address the following issues:

- Determine the nature and extent of the contamination at the subject Property; and,

- Obtain the necessary information needed to design a Remedial Program for the Site.

The investigative methods that will be used include well drilling, monitoring well installation, monitoring well sampling, soil vapor probe installation and sampling and soil sampling. These are described in detail in the Site Characterization Work Plan.

1.4 Project Organization – Mr. Weinstock will serve as the Project Manager (PM) and will be responsible for the overall scheduling and performance of all investigative activities.

Mr. Weinstock will also serve as the Quality Assurance Officer (QAO) for this project. His duties will include:

- Review of laboratory data packages
- Interface with laboratory
- Performance of Field Audits

Experienced CA RICH staff will perform and/or oversee completion of all the field activities described in the Investigation Work Plan. Appendix A provides a copy of CA RICH résumés.

1.5 Quality Assurance Objectives and Data Measurement – There are two sources of data collection methodology that will provide data information during this Investigation.

Field Screening - Organic vapor readings will be recorded from the head space of soil samples. This data is intended to be used only as a screening tool. To meet these goals, clean sampling tools will be used for each head space measurement and the photo-ionization detector (PID) will be calibrated at the beginning of each screening day on-site.

Chemical Analysis – All environmental samples will delivered to a New York State- ELAP Certified laboratory contracted to CA RICH for chemical analysis. This data is intended to determine the nature and extent of contamination in soil and groundwater. The laboratory will follow the NYSDEC – Analytical Services Protocol dated 2005. All analytical reports will be prepared in NYSDEC ASP Category B deliverables. All samples will be placed in iced-filled coolers and delivered to the laboratory within 48 hours of collection.

Quality assurance objectives are generally defined in terms of five parameters:

- **Representativeness -** Representativeness is the degree to which sampling data accurately and precisely represents site conditions, and is dependent on sampling and analytical variability. The Supplemental Site Investigation Work Plan has been designed to assess the presence of the constituents in the target media at the time of sampling. The Plan presents the rationale for sample quantities and location. The Plan also presents field sampling methodologies and laboratory analytical methodologies.

  The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data. Further discussion of QC checks is presented in Section 1.11.

- **Comparability** - Comparability is the degree of confidence with which one data set can be compared to another data set. Comparability between this investigation and to the extent possible, with existing data will be maintained through consistent sampling and analytical methodology set forth in the QAPP; the and the Supplemental Site Investigation Work Plan; the NYSDEC ASP analytical methods (2005) with NYSDEC ASP QA/QC requirements (1995); and through use of QA/QC procedures and appropriately trained personnel.

- **Completeness -** Completeness is defined as a measure of the amount of valid data obtained from a sampling event compared to the amount that was expected to be obtained under normal conditions. This will be determined upon assessment of the analytical results.

- **Precision -** Precision is the measure of reproducibility of sample results. The goal is to maintain a level of analytical precision consistent with the objectives of the Work Plan. To maximize precision, sampling and analytical procedures will be followed. All work for the investigation phase of this project will adhere to established protocols presented in the QAPP, and Supplemental Site Investigation Work Plan. Checks for analytical precision will include the analysis of matrix spike duplicated, laboratory duplicates, and field duplicates. Checks for field measurement precision will include obtaining duplicate field measurements. Further discussion of precision QC checks is provided in Section 1.11.

- **Accuracy** - Accuracy is the deviation of a measurement from the true value of a known standard. Both field and analytical accuracy will be monitored through initial and continuing calibration of instruments. In addition, internal standards, matrix spikes, blank spikes, and surrogates (system monitoring compounds) will be used to assess the accuracy of the laboratory analytical data.

1.6 Sampling Procedures - The sampling procedures that will be employed are discussed in detail in the Site Characterization Work Plan.

1.7 Sample and Document Custody Procedures

- **General** - The Chain-of-Custody program allows for the tracing of possession and handling of the sample from its time of collection through its chemical analysis in the laboratory Appendix B provides a sample chain of custody. The chain-of-custody program at this site will include:

    - Sample labels
    - Chain-of-Custody records
    - Field records

- **Sample Container Details**

Sample Matrix and Parameters	Container Type and Preservative	Method	Holding Time*
Soil			
VOCs	3 – 2 oz jars	USEPA 8260C	14 Days
SVOCs	1 - 8 oz jar	USEPA 8270	7 Days
Pesticides	1 - 8 oz jar	USEPA 8081	7 Days
PCBs	1 - 8 oz jar	USEPA 8082	7 Days
Total Metals	1 - 8 oz jar	SW6010/SW4771B	28 Days**
Groundwater			
VOCs	3 - 40 Vial with HCL	USEPA 8260C	14 Days
SVOCs	1 - 1 Liter Amber Unpreserved	USEPA 8270	7 Days
Pesticides	1 - 1 Liter Amber Unpreserved	USEPA 8081	7 Days
PCBs	1 - 1 Liter Amber Unpreserved	USEPA 8082	7 Days
Total Metals	1 - 500ml Plastic HNO3	SW6010/SW4771B	28 Days**
Dissolved Metals	1 - 500ml Plastic HNO3	SW6010/SW4771B	28 Days**
Soil Vapor, Indoor Air and Ambient Air			
VOCs	1 - Six-liter Summa Canister /None	TO-15	30 Days

*Holding Time is calculated from collection date as per ASP – Exhibit1
** For Mercury the holding time is 28 days for all other 180 days
All soil and groundwater samples will be stored at < 4°C +/- 2°

- **Sample Labels** - To prevent misidentification of samples, a label will be affixed to the sample container and will contain the following information:

  - Site Name
  - Sample identification number
  - Date and time of collection
  - Initials of Sampler
  - Preservation (if any)
  - Type of analysis to be conducted.

- **Chain-of-Custody Records** - To establish the documentation necessary to trace sample possession from the time of collection, a chain-of-custody record (sample attached) will be filled out and will accompany samples at all times. The record will contain the following information:

  - Project name:
  - Printed name and signature of samplers
  - Sample number
  - Date and time of collection
  - Sampling location
  - Number of containers for each sample

- Signature of individuals involved in sample transfer (when relinquishing and accepting samples)
- Inclusive dates and times of possession.

- **Field Records** - Field records will be maintained during each sampling effort in a logbook. All aspects of sample collection, handling and visual observations will be recorded. All sample collection equipment, field analytical equipment and equipment utilized to make physical measurements will be identified in the field logbook.

  All calculations, results and calibration data for field sampling, field analytical and field physical measurement equipment will also be recorded in the field logbook. Entries will be dated and initialed. Entries will be made in ink, and will be legible.

1.8 Calibration Procedures and Frequency - The contracted laboratory will follow the NYSDEC Category-B requirements for equipment calibration procedures and frequency.

The QA Officer will be responsible for ensuring that the Field PID is calibrated at the beginning of each day of field sampling using calibration gas supplied by the manufacturer. A log of the meter calibration will be kept in the field logbook.

1.9 Analytical Procedures - All laboratory analysis will follow NYSDEC ASP (2005) protocols with Category B deliverables. The following samples will be collected for QA/QC purposes: 1 trip blank, 1 field blank, 1 duplicate samples, 1 matrix spike, and 1 matrix spike duplicate per every twenty field samples. A qualified data validator will review the laboratory data and a Data Usability Summary Report (DUSR) will be prepared.

1.10 Data Reduction, Validation and Reporting

- **Field Data** - All field data recorded in logbooks or on log sheets will be evaluated in the Office and transferred to word processor text by field personnel or clerical staff. PID readings will be included on the logs. The QAO and/or PM will review this data for accuracy and completeness. Typed test pit logs will be prepared for all test pits. Construction diagrams will be prepared for all monitoring wells and soil vapor probes installed by CA RICH.

- **Laboratory Data** - The laboratory will transfer the instrument readings to laboratory report forms. Ms. Lori Beyer will perform independent data validation of all analytical data using NYSDEC DUSR protocols. Appendix A provides a copy of Ms. Lori Beyers résumé.

  The Data Validator will provide CA RICH with a Data Validation Summary Report in accordance with Appendix 2B of DER-10. The data validator will be instructed to apply "JL" qualifiers to VOC data with detections of less than 200 ppb in accordance with EPA Method 5035. The QAO will review the summary report as well as other field data and prepare a Data Usability Report.

  CA RICH will prepare summary tables of the validated analytical data using computer spreadsheet software. The data entries will be reviewed using the red check-green check method. All entries will be reviewed and entry errors will be marked in red ink. Once these entries are corrected, the printouts will be marked with green ink and placed in the project file.

1.11 Internal Quality Control Checks

Both field and laboratory quality control checks are proposed for this project. In the event that there are any deviations from these checks, the Project Manager and Quality Assurance Officer will be notified. The proposed field and laboratory control checks are discussed below.

Field Quality Control Checks

- **Field Measurements -** To verify the quality of data collected using field instrumentation, at least one duplicate measurement will be obtained per day and reported for all field analytical measurements.

- **Sample Containers -** Certified-clean sample containers will be supplied by the contracted laboratory.

- **Field Duplicates** – Field duplicates will be collected to check reproducibility of the sampling methods. Field duplicates will be prepared as discussed in the Supplemental Site Investigation Work Plan. Field duplicates will be analyzed every 20 field samples.

- **Field Rinse Blanks** – Field rinse blanks are used to monitor the cleanliness of the sampling equipment and the effectiveness of the cleaning procedures. Field rinse blanks will be prepared and submitted for analysis during this investigation. Field rinse blanks will be prepared by filling sample containers with analyte-free water (supplied by the laboratory), which has been routed through a cleaned sampling device.

- **Trip Blanks** – Trip blanks will be used to assess whether site samples have been exposed to non-site-related volatile constituents during storage and transport. Trip blanks will be analyzed at a frequency of once per day, and will be analyzed for volatile organic constituents. A trip blank will consist of a container filled with analyte-free water (supplied by the laboratory), which remains unopened with field samples throughout the sampling event. Trip blanks will only be analyzed for volatile organic constituents.

1.12 Performance and Systems Audits

Performance and systems audits will be completed in the field and the laboratory during the investigation phase of this project as described below.

- **Field Audits –** CA RICH's Project Manager and Quality Assurance Officer will monitor field performance and field meter calibrations to verify that measurements are taken according to established protocols. The Project Manager will review all field logs. In addition, the Project Manager and the Quality Assurance Officer will review the field rinse and trip blank data to identify potential deficiencies in field sampling and cleaning procedures.

- **Laboratory Audits** – The contracted laboratory will perform internal audits consistent with NYSDEC ASP (1995).

1.13 Preventive Maintenance

Preventive maintenance schedules have been developed for both field and laboratory instruments. A summary of the maintenance activities to be performed is presented below.

- **Field Instruments and Equipment -** Prior to any field sampling, each piece of field equipment will be inspected to assure it is operational. If the equipment is not operational, it must be serviced prior to use. All meters which require charging or batteries will be fully charged or have fresh batteries. If instrument servicing is required, it is the responsibility of the field personnel to follow the maintenance schedule and arrange for prompt service.

- **Laboratory Instruments and Equipment -** The laboratory will document Laboratory instrument and equipment procedures. Documentation includes details of any observed problems, corrective measure(s), routine maintenance, and instrument repair (which will include information regarding the repair and the individual who performed the repair).

  Preventive maintenance of laboratory equipment generally will follow the guidelines recommended by the manufacturer. A malfunctioning instrument will be repaired immediately by in-house staff or through a service call from the manufacturer.

1.14 Data Assessment Procedures

The analytical data generated during the Investigation Work Plan will be evaluated with respect to precision, accuracy, and completeness. The procedures utilized when assessing data precision, accuracy, and completeness are presented below.

- **Data Precision Assessment Procedures -** Field precision is difficult to measure because of temporal variations in field parameters. However, precision will be controlled through the use of experienced field personnel, properly calibrated meters, and duplicate field measurements. Field duplicates will be used to assess precision for the entire measurement system including sampling, handling, shipping, storage, preparation and analysis.

  Laboratory data precision for organic analyses will be monitored through the use of matrix spike duplicate sample analyses. For other parameters, laboratory data precision will be monitored through the use of field duplicates and/or laboratory duplicates.

  The precision of data will be measured by calculation of the standard deviation (SD) and the coefficient of variation (CV) of duplicate sample sets. The SD and CV are calculated for duplicate sample sets by:

$$SD = (A-B)/1.414$$
$$CV = SD/((A+B)/2) = 1.414(A-B)/(A+B)$$

  Where:

  A = Analytical result from one of two duplicate measurements
  B = Analytical result from the second measurement.

  Where appropriate, A and B may be either the raw measurement or an appropriate mathematical transformation of the raw measurement (e.g., the logarithm of the concentration of a substance).

Alternately, the relative percent difference (RPD) can be calculated by the following equation:

$$RPD = \frac{(A-B)}{(A+B)/2} \times 100$$

$$RPD = 1.414\ (CV)(100)$$

- **Data Accuracy Assessment Procedures -** The accuracy of field measurements will be controlled by experienced field personnel, properly calibrated field meters, and adherence to established protocols. The accuracy of field meters will be assessed by review of calibration and maintenance logs.

  Laboratory accuracy will be assessed via the use of matrix spikes, surrogate spikes, and internal standards. Where available and appropriate, QA performance standards will be analyzed periodically to assess laboratory accuracy. Accuracy will be calculated as a percent recovery as follows:

$$Accuracy = \frac{A-X}{B} \times 100$$

  Where:

  A = Value measured in spiked sample or standard
  X = Value measured in original sample
  B = True value of amount added to sample or true value of standard

  This formula is derived under the assumption of constant accuracy over the original and spiked measurements. If any accuracy calculated by this formula is outside of the acceptable levels, data will be evaluated to determine whether the deviation represents unacceptable accuracy, or variable, but acceptable accuracy. Accuracy objectives for matrix spike recoveries and surrogate recovery objectives are identified in the NYSDEC, ASP (1995).

- **Data Completeness Assessment Procedures -** Completeness of a field or laboratory data set will be calculated by comparing the number of samples collected or analyzed to the proposed number.

$$Completeness = \frac{\text{No. Valid Samples Collected or Analyzed}}{\text{No. Proposed Samples Collected or Analyzed}} \times 100$$

  As general guidelines, overall project completeness is expected to be at least 90 percent. The assessment of completeness will require professional judgment to determine data usability for intended purposes.

1.15 Corrective Action

Corrective actions are required when field or analytical data are not within the objectives specified in this QAPP, or the Supplemental Investigation Work Plan. Corrective actions include procedures to promptly investigate, document, evaluate, and correct data collection and/or analytical procedures. Field and laboratory corrective action procedures for this project are described below.

- **Field Procedures** - When conducting the investigative fieldwork, if a condition is noted that would have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause and corrective action implemented will be documented as a memo to the project file and reported to the Project Manager.

  Examples of situations, which would require corrective actions, are provided below:

  - Protocols as defined by the QAPP and the Supplemental Site Investigation Work Plan have not been followed;
  - Equipment is not in proper working order or properly calibrated;
  - QC requirements have not been met; and
  - Issues resulting from performance or systems audits.

  Project field personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

- **Laboratory Procedures -** In the laboratory, when a condition is noted to have an adverse effect on data quality, corrective action will be taken so as not to repeat this condition. Condition identification, cause and corrective action to be taken will be documented, and reported to the Quality Assurance Officer.

  Corrective action may be initiated, at a minimum, under the following conditions:

  - Specific laboratory analytical protocols have not been followed;
  - Predetermined data acceptance standards are not obtained;
  - Equipment is not in proper working order or calibrated;
  - Sample and test results are not completely traceable;
  - QC requirements have not been met; and
  - Issues resulting from performance or systems audits.

  Laboratory personnel will continuously monitor ongoing work performance in the normal course of daily responsibilities.

1.16 Quality Assurance Reports and Management

- **Internal Reporting -** The analytical laboratory will submit analytical reports using NYSDEC ASP (1995), Category B requirements. The analytical reports will be submitted to the Data Validator for review. Supporting data (i.e., historic data, related field or laboratory data) will also be reviewed to evaluate data quality, as appropriate. The Quality Assurance Officer will incorporate results of data validation reports (if any) and assessments of data usability into a summary report. This report will be filed in the project file and will include the following:

    - Assessment of data accuracy, precision, and completeness for field & laboratory data;
    - Results of the performance and systems audits;
    - Significant QA/AC problems, solutions, corrections, and potential consequences;
    - Analytical data validation report; and
    - Data usability report.

- **Reporting** - The Site Characterization Report will contain a separate QA/QC section including the DUSR and a summary of data collected and/or used as appropriate to the project DQOs. The Quality Assurance Officer will prepare the QA/QC summary tables and reports and memoranda documenting the data assessment and validation.

1.17 Proposed Sub-Contractors (subject to change based on availability)

- Geophysics – Naeva Geophysics, Inc.
- Drilling – Zebra Environmental, Corp.
- Laboratory – Accutest Laboratories
- Surveying – American Engineering and Land Surveying
- Data validator – Lori Beyer

APPENDIX A

Résumés

ERIC A. WEINSTOCK, CPG, CGWP

- **TITLE**

  Vice President

- **EDUCATION**

  Master of Science, Engineering Geology, Georgia Tech, 1980
  Bachelor of Science, Geology, State University of New York at Oneonta, 1978

- **CERTIFICATIONS AND REGISTRATIONS**

  Certified Ground Water Professional, No. 278
  Certified Professional Geologist, No. 7391
  Health & Safety Operations at Hazardous Material Sites; 29 CRF 1910.120
  Registered Professional Geologist in Delaware (No.379), South Carolina (No. 544), and Pennsylvania (No. 925-G)

- **PROFESSIONAL AFFILIATIONS**

  National Ground Water Association
  American Institute of Professional Geologists

- **PROFESSIONAL EXPERIENCE**

  Vice President and Senior Hydrogeologist, CA Rich Consultants, Inc., 1988 - Present

  Mr. Weinstock serves as both a Project Manager and a Technical Supervisor. Since 1988, he has served as the Project Manager for numerous ground water, regulatory compliance, and real estate related projects.

  Eric's responsibilities at the Firm include management of the following investigations and cleanups:

  Federal and State Superfund

  - Tronic Plating Co., Farmingdale, NY
  - Tishcon Corporation, Westbury, NY
  - Stewart Hall Chemical Corp., Mt. Vernon, NY
  - Jim Jam Cleaners, Merrick, NY
  - Coral Graphics Site, Hicksville, NY
  - Bon Ton Cleaners Site, Brooklyn, NY

  Brownfields

  - Spring Creek Gardens, Brooklyn, NY (former Superfund site)
  - Atlantic Terrace*, Brooklyn, NY (former gas station)
  - Atlantic Avenue Apartments*, Brooklyn, NY (former vacant lot)
  - Victorian Home of Levittown, Levittown, NY (former auto dealership)

  * Recipient of the "Big Apple Brownfield Award" by NYCOER

Oil Spills

- 875 5th Avenue, NYC – Multi-phase extraction of subsurface No. 6 heating oil
- Best Metropolitan Towel & Linen Supply Co., Brooklyn, NY – Total fluids recovery of subsurface No. 6 heating oil.

Resource Conservation and Recovery Act (RCRA) Compliance

- U.S. Electroplating Corporation, No. Babylon, NY
- J.C. Solutions, Port Washington, NY

Senior Hydrogeologist, Camp Dresser & McKee, NY, 1984 - 1988

Mr. Weinstock was the Project Geologist for the Port Washington Landfill RI/FS, a U. S. EPA Superfund site. He was in charge of a drilling program including 400 foot-deep monitoring wells and landfill gas wells. He assisted in the use of CDM's Dynflow/Dyntrack computer model to assess remedial alternatives.

Eric developed a simulation of the regional stratigraphy of Nassau County for NCDPW's regional groundwater model. This information, along with hydrologic data, is being used by the County in Dynflow/Dyntrack to model the effects of pumping.

At the Metaltec/Aerosystems U.S. EPA Superfund site in Franklin, N.J., Mr. Weinstock was in charge of a remedial investigation of a metals plating site. The project included monitoring well installation; soil, surface water and groundwater sampling; and aquifer pump testing. This information was used to assess remedial alternatives in the Feasibility Study.

Hydrogeologist, Leeds Hill & Jewett, San Francisco, CA, 1982 - 1984

Eric served as a field geologist for the drilling and installation of 1,000 gpm production water wells for a power plant in Nevada. His duties included supervision of drillers, interpretation of geophysical logs, inspection of well construction and pump testing.

Mr. Weinstock was in charge of a drilling and well installation program to determine the extent of a 50,000-gallon plume of jet fuel at this U.S. Navy Base in Southern California.

Hydrogeologist, Dames & Moore, San Francisco, CA, 1980 - 1982

Mr. Weinstock supervised the installation, sampling and testing of a RCRA monitoring well network at a Chevron refinery and chemical plant in Richmond, Calif. Duties included drilling supervision, geophysical logging, mapping, pump testing and sampling.

SELECTED PUBLICATIONS

Rao, S.G. and Weinstock, E.A., 1981, *"Numerical Modeling of Solute Transport in Groundwater; An Application to a Landfill Site in Florida."* Paper presented at the 17th Am. Water Resources Assoc., National Conference, October 4-8, 1981, Atlanta, Georgia.

Weinstock, Eric A., 1988, "*A Sensible Alternative for the Installation of Monitoring Wells*," Water Well Journal, December 1988.

Weinstock, Eric A., 1991, *"Phase II Environmental Assessments*, Water Well Journal," April 1991

Weinstock, Eric A., 1992, *"Cost-Effective Options for the Collection of Subsurface Soil, Soil Gas and Groundwater Samples*," The National Environmental Journal, Nov/Dec 1992.

Weinstock, Eric A., 1996, *"Methods for the Collection of Subsurface Samples during Environmental Site Assessments"*, in Sampling Environmental Media, ASTM STP 1282.

Weinstock, Eric A., 2001, "*Dry Cleaners, Perchloroethene and Glacial Aquifers – Lessons Learned on Long Island, New York"*, The Professional Geologist, September/October, 2001

Weinstock, Eric A. and Sobstyl, Steven, 2003, "Comparison of Site Remediation Costs for Cleanups Performed Under Federal, State and County Oversight", NGWA Conference on Remediation: Site Closure and the Total Cost of Cleanup, November 13-14, 2003, New Orleans, LA.

Weinstock, Eric A., 2004, *"Dual-Treatment Approach to Perc Cleanup"*, Drycleaner News.

Weinstock, Eric A. and Shapiro, Deborah, 2006, *Redeveloping "E-Sites" in New York City*, in The Real Estate Journal, January 3-9, 2006.

Weinstock, Eric A., Osmundsen, Steven, and Shapiro, Deborah, 2008, "Subsurface Evaluation Through Sub-Slab Depressurization, The Investigation and Remediation of a Dry Cleaning Facility in Brooklyn, NY", NGWA Conference on Eastern Regional Ground Water Issues, June 23-24, 2008, Ronkonkoma, NY.

Weinstock, Eric A. "*Sub-Slab Depressurization – A Necessary Part of the Final Remedy*", The Professional Geologist, January/February 2009

Sanghvi,S, M. Magnusson, E. Weinstock and H. Gershen, From Brown to Green to Gold, An Innovative Mixed-Income, Mixed-Use, Residential Development grows in Brooklyn, AIANYS October 14, 2010, also published in Brownfield Renewal, October-November 2010.

- **SELECTED LECTURES**

  Guest Hydrogeology lecturer, Manhattan College & Cooper Union, 1988; Adelphi University, 1991; CW Post University, 2011

  Guest lecturer, NYC Mayor's Office of Environmental Remediation, Big Apple Brownfields Work Shop, 2008

- **EXPERT TESTIMONY**

  Commerce Holding Co. Inc. v. the Board of Assessors of the Town of Babylon
  Suffolk County Supreme Court, 1991

  State of New York v. AMN Oil Corp and Alvin Petroleum, et. al
  New York State Court, 2006

  F.C. Properties v. the County of Nassau
  New York State Court, 2009

JESSICA E. PROSCIA

- **TITLE**

  Project Environmental Scientist

- **EDUCATION**

  Bachelor of Science, Health Science, Environmental Health and Safety, State University of New York at Stony Brook, 2007

- **CERTIFICATIONS**

  40-hour OSHA Hazardous Waste Operations and Emergency Response Training (OSHA 29 CFR 1910.120)
  8-hour OSHA Hazardous Waste Operations and Emergency Response Refresher Training
  Standard First Aid Training - American Red Cross
  CPR Training – American Red Cross

- **PROFESSIONAL EXPERIENCE**

  Project Environmental Scientist, C A Rich Consultants, Inc., Oct. 2008 – Present

  As a Project Environmental Scientist with CA RICH, Ms. Proscia's responsibilities include the conductance of Phase I and Phase II Environmental Site Assessments. Ms. Proscia has also conducted all aspects of environmental investigations including UST removals, supervision of drilling and well installation, sanitary system or dry well clean-outs, groundwater, and soil sampling, soil delineation, excavation, petroleum and hazardous waste disposal, analytical interpretation, groundwater contouring, and report preparation.

  Environmental Scientist/Health and Safety Officer, Hydro Tech Environmental, Corp., 2007 - 2008

  As an Environmental Scientist with Hydro Tech Environmental, Ms. Proscia's responsibilities included Phase I ESA's through Subsurface Investigations. Ms. Proscia was also involved in site supervision on several properties in New York State.

  Ms. Proscia performed on site safety inspections for the company's field crew as well as trained staff for the OSHA 40-hour and 8-hour refresher course.

L.A.B. Validation Corp.
Qualification Summary

Services Overview

L.A.B. Validation is an independent outside source that evaluates data integrity, compliance and usability. L.A.B Validation utilizes the USEPA National Functional Guidelines, as well as other program specific requirements supplied by the client. L.A.B. Validation has a dedicated office facility and secure data storage area. Projects are scheduled and completed within client specified deadlines. Reports are issued via hardcopy and or fax/email/disk deliverables. L.A.B. Validation Corp. operates under Employer Identification Number 58-238-1714 and maintains General Liability Insurance for all projects.

Personnel Overview

L.A.B. Validation has a unique blend of technical expertise and environmental laboratory operational experience. Ms. Beyer has 25 years of progressive positions that required analytical and QA working knowledge. She is well versed in Organic and Inorganic analyses and the associated USEPA requirements as well as other Federal Agency (i.e. USCOE) and State regulations. She has completed data validation training for both Organic and Inorganic analyses (see attached Certificates).

References

Mr. Scott Haas
Foster Wheeler Environmental Corporation
4960 Corporate Drive, Suite 140
Huntsville, AL 35805
Phone (256) 830-4100
Program: US NAVY RAC

Mr. Chris Candela
Clean Tech
2700 Capitol Trail
Newark, DE 19711
Phone (302) 999-0925
Program: USACOE

Mr. David Allen
The Kevric Company, Inc.
Silver Spring Metro Plaza One
8401 Colesville Road, Suite 610
Silver Spring, Maryland 20910
Program: US NAVY RAC

Mr. Andy Coenen
Environmental Resources Management
510 Broadhollow Road, Suite 210
Melville, New York 11747
Phone (631) 756-8900
Program: NYSDEC RI/FS

Mr. Steve Malinowski
CA Rich Consultants
17 Dupont Street
Plainview, New York 11771
Phone (516) 589-0093
Program: USEPA/NYSDEC SUPERFUND

Mr. Carl Hsu
Tetratech, Inc.
58 West Main Street
Christiana, DE 19702
Phone (302) 738-7551
Program: USACOE

Mr. Joseph Heaney
Walden Associates
16 Spring Street
Oyster Bay, New York 11771
Phone (516) 624-7200
Program: NYSDEC

Mr. Dan Palmer
Modern Continental Construction Co., Inc.
950 Fountain Avenue
Brooklyn, New York
Program: NYCDEP

L.A.B. Validation Corp., 14 West Point Drive, East Northport, New York 11731

Lori A. Beyer

SUMMARY: General Manager/Laboratory Director with a solid technical background combined with Management experience in environmental testing industry. Outstanding organizational, leadership, communication and technical skills. Customer focused, quality oriented professional with consistently high marks in customer/employee satisfaction.

EXPERIENCE:

1998-Present L.A.B. Validation Corporation, 14 West Point Drive, East Northport, NY
President

- Perform Data Validation activities relating to laboratory generated Organic and Inorganic Environmental Data.

1998-Present American Analytical Laboratories, LLC. 56 Toledo Street, Farmingdale, NY
Laboratory Director/Technical Director

- Plan, direct and control the operation, development and implementation of programs for the entire laboratory in order to meet AAL's financial and operational performance standards.
- Ensures that all operations are in compliance with AAL's QA manual and other appropriate regulatory requirements.
- Actively maintains a safe and healthy working environmental that is demanded by local laws/regulations.
- Monitors and manages group's performance with respect to data quality, on time delivery, safety, analyst development/goal achievement and any other key performance indices.
- Reviews work for accuracy and completeness prior to release of results to customers.

1996-1998 Nytest Environmental, Inc. (NEI) Port Washington, New York
General Manager

- Responsible for controlling the operation of an 18,000 square foot facility to meet NEI's financial and operational performance standards.
- Management of 65 FTEs including Sales and Operations
- Ensure that all operations are in compliance with NEI's QA procedures
- Ensures that productivity indicators, staffing levels and other cost factors are held within established guidelines
- Maintains a quantified model of laboratory's capacity and uses this model as the basis for controlling the flow of work into and through the lab so as to ensure that customer requirements and lab's revenue and contribution targets are achieved.

1994-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Technical Project Manager

- Responsible for the coordination and implementation of environmental testing programs requirements between NEI and their customers
- Supervise Customer Service Department
- Assist in the development of major proposals
- Complete management of all Federal and State Contracts and assigned commercial contracts
- Provide technical assistance to the customer, including data validation and interpretation
- Review and implement Project specific QAPP's.

1995-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Corporate QA/QC Officer

- Responsible for the implementation of QA practices as required in the NJDEP and EPA Contracts
- Primary contact for NJDEP QA/QC issues including SOP preparation, review and approval
- Responsible for review, verification and adherence to the Contract requirements and NEI QA Plan

1992-1994 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Manager

- Responsible for the accurate compilation, review and delivery of analytical data to the company's customers. Directly and effectively supervised a department of 22 personnel.
- Managed activities of the data processing software including method development, form creation, and production
- Implement new protocol requirements for report and data management formats
- Maintained control of data storage/archival areas as EPA/CLP document control officer

1987-1991 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Specialist

- Responsible for the review of GC, GC/MS, Metals and Wet Chemistry data in accordance with regulatory requirements
- Proficient with USEPA, NYSDEC, NJDEP and NEESA requirements
- Review data generated in accordance with SW846, NYSDEC ASP, EPA/CLP and 40 CFR Methodologies

1986-1987 Nytest Environmental, Inc (NEI) Port Washington, New York
GC/MS VOA Analyst

EDUCATION:

1982-1985 State University of New York at Stony Brook, New York; BS Biology/Biochemistry
1981-1982 University of Delaware; Biology/Chemistry
5/91 **Rutgers University; Mass Spectral Data Interpretation Course, GC/MS Training**
8/92 **Westchester Community College; Organic Data Validation Course**
9/93 **Westchester Community College; Inorganic Data Validation Course**

Westchester Community College

Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

ORGANIC DATA VALIDATION COURSE (35 HOURS)

Dr. John Samuelian

Date AUGUST 1992

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

Westchester Community College

Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

INORGANIC DATA VALIDATION

Instructor: Dale Boshart

Date MARCH 1993

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

State University of New York

State University at Stony Brook

On the Recommendation of the Faculty and by Virtue of the Authority vested in them the Trustees of the University have conferred on

Lori Ann Isenberg

the Degree of

Bachelor of Science

and have granted this Diploma as evidence thereof
Given at Stony Brook, in the State of New York, in the United States of America on the twentieth day of December one thousand nine hundred and eighty-five.

Chairman of the Board of Trustees

Chairman of the Council,
State University at Stony Brook

STATE UNIVERSITY OF NEW YORK · TO LEARN · TO SEARCH · TO SERVE · 1948

Chancellor of the State University of New York

President,
State University at Stony Brook

APPENDIX B

Sample Chain of Custody

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

2235 Route 130, Dayton, NJ 08810
Tel: 732-329-0200 FAX: 732-329-3499/3480
www. acutest.com

PAGE ___ OF ___

FED-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job #

Client / Reporting Information	Project Information	Requested Analysis (see TEST CODE sheet)
Company Name	Project Name:	
Street Address	Street	Billing Information (if different from Report to)
City State Zip	City State	Company Name
Project Contact E-mail	Project #	Street Address
Phone # Fax #	Client Purchase Order #	City State Zip
Sampler(s) Name(s) Phone #	Project Manager	Attention:

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB-Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	LAB USE ONLY

Turnaround Time (Business days)

- ☐ Std. 15 Business Days
- ☐ Std. 10 Business Days (by Contract only)
- ☐ 10 Day *RUSH*
- ☐ 5 Day *RUSH*
- ☐ 3 Day *EMERGENCY*
- ☐ 2 Day *EMERGENCY*
- ☐ 1 Day *EMERGENCY*

Emergency & Rush T/A data available VIA Lablink

Approved By (Accutest PM): / Date:

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format ____
- ☐ Other ____

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1	2		2
3		3	4		4
5		5			

Custody Seal # ☐ Intact ☐ Not intact — Preserved where applicable ☐ — On Ice ☐ — Cooler Temp.

Appendix B

Health & Safety & Community Air Monitoring Plan

HEALTH AND SAFETY PLAN
&
COMMUNITY AIR MONITORING PLAN

For

SITE CHARACTERIZATION WORK PLAN

1801 Falmouth Avenue, New Hyde Park, NY
NYSDEC SITE #130211

June 2012

Prepared for:
SEABOARD ESTATES, INC.
c/o BEVERIDGE & DIAMOND, LLC
477 Madison Avenue, 15th Floor
New York, NY 10022-5802

Prepared by:

CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, NY 11803-1614

HEALTH AND SAFETY PLAN
&
COMMUNITY AIR MONITORING PLAN

1.0 INTRODUCTION

This Health and Safety Plan (HASP) is developed for implementation during the planned site characterization activities at 1801 Falmouth Avenue, New Hyde Park, New York, NYSDEC Site #130211 (hereinafter referred to as the 'Site'). The HASP is to be enforced by the Project Health and Safety Manager and on-site Health & Safety Coordinator (HSC). The on-site HSC will interface with the Project Manager and is vested with the authority to make field decisions including the termination of on-site activities if an imminent health and safety hazard, condition or related concern arises. Information and protocol in the HASP is applicable to all on-site personnel who will be entering the work zone.

2.0 POTENTIAL HAZARDS

2.1 Chemical Hazards

During the investigation activities, CA RICH Consultants, Inc. (CA RICH) will operate as if the contaminants of concern are 1,1,1-trichloroethane (TCA) and its degradation products.

TCA looks like water and has a mild sweet odor like the odor of chloroform or ether. TCA vapor is heavier than air, so it can collect in very high concentrations in pits, tanks, or other low spots. Acute exposure to significant concentrations of TCA can cause irritation of the skin, eyes and mucus membrane, headache, dizziness, nausea, and in high enough concentrations, loss of consciousness and death *(Sax, 1984)*. It is suspected to be carcinogenic with chronic exposure.

Physical properties and additional toxicological information is included in Appendix A.

2.2 Other Health and Safety Risks

The HASP addresses the environmentally-related chemical hazards identified on the Site. Normal physical hazards associated with using drilling equipment and hand tools as well as hazards associated with adverse climatic conditions (heat & cold) also exist and represent a certain degree of risk to be assumed by on-site personnel.

Certain provisions in this Plan, specifically the use of personnel protective equipment, may tend to increase the risk of physical injury, as well as susceptibility to cold or heat stress. This is primarily due to restrictions in dexterity, hearing, sight, and normal body heat transfer inherent in the use of protective gear.

3.0 RISK MANAGEMENT

3.1 Work / Exclusion Zones

For each proposed investigation activity (eg. monitoring well installation, soil vapor sampling, etc.), a work / exclusion zone will be established surrounding the activity. Access to this area will be limited to properly trained, properly protected personnel directly involved with the on-site activities. Enforcement of the work / exclusion zone boundaries is the responsibility of the on-site Health and Safety Coordinator.

3.2 Personnel Protection

Health & Safety regulatory personnel have developed different levels of personnel protection to deal with differing degrees of potential risks of exposure to chemical constituents. The levels are designated as **A, B, C,** and **D** and ranked according to the amount of personnel protection afforded by each level. Level **A** is the highest level of protection and Level **D** is the lowest level of protection as described below.

A – Fully encapsulating suit, SCBA, hard hat, chemical-resistant steel-toed boots, boot covers, inner and outer gloves.

B – One-piece, hooded chemical-resistant splash suit, SCBA, hard hat, chemical-resistant steel-toed boots, boot covers, inner and outer gloves.

C – One-piece, hooded chemical-resistant splash suit, hard hat, canister equipped face mask, chemical-resistant steel-toed boots, boot covers, inner and outer gloves.

D – Work clothes, hard hat (optional), work boots/shoes, gloves (as needed).

The different levels are primarily dependent upon the degree of respiratory protection necessary, in conjunction with appropriate protective clothing. Levels of protection mandate a degree of respiratory protection. However, flexibility exists within the lower levels (B, C, and D) concerning proper protective clothing.

The four levels of protection were developed for utilization in situations which involve suspected or known atmospheric and/or environmental hazards including airborne contamination and skin-affecting substances.

It is anticipated that all of the investigation work will be performed using Level D protection (no respiratory protection with protective clothing requirements limited to long sleeved shirts, long pants or coveralls, work gloves and steel-toe leather work boots).

Level D may be modified by the HSC to include protective clothing or equipment (Saran-coated disposable coveralls or PVC splash suits, safety glasses, hard hat with face shield, and chemically resistant boots) based upon physical hazards, skin contact concerns, and real-time monitoring.

Real-time air monitoring for total airborne organics using either a photo-ionization detector will determine if and when an upgrade from Level D to a higher level of respiratory protection is warranted. Decisions for an upgrade from Level D to higher levels of protection, mitigative actions, and/or suspension of work are the responsibility of the Project Manager and/or the designated on-site Health & Safety Coordinator.

3.3 Air Monitoring

The Health & Safety Coordinator or his properly trained assignee will conduct “Real Time” air monitoring for total organic vapor and total particulates. 'Real-time' monitoring refers to the utilization of instrumentation, which yields immediate measurements. The utilization of real time monitoring helps determine immediate or long-term risks to on-site personnel and the general public, the appropriate level of personnel respiratory protection necessary, and actions to mitigate the recognized hazard. Air monitoring will be conducted in accordance with NYSDOH's Community Air Monitoring Program.

3.3.1. Particulate Monitoring

a. Instrumentation

Dust particulates in air will be monitored using a light scattering technique MINIRAM Model PDM-3 Miniature Real-time Aerosol Monitor (MINIRAM) or equivalent. The MINIRAM is capable of measuring airborne dust particles within the range of 10 to 100,000 micrograms per cubic meter ($\mu g/m^3$).

b. Application

Dust monitoring will occur at regular intervals excavation work activities. Monitoring will be conducted in upgradient and downgradient locations, relative to prevailing wind direction) along the perimeter of the work zone. The HSC or his designee will perform monitoring. As outlined in the NYSDOH Community Air Monitoring Plan, if particulate levels in the downwind location are 150 mg/m^3 greater than those measured in the upwind location, dust suppression techniques shall be employed.

3.3.2 Organic Vapor

a. Instrumentation

Real-time monitoring for total organic vapor (TOV) utilizes either a photo-ionization detector (PID) or flame ionization detector (FID). The appropriate PID is an intrinsically safe HNU Systems Model PI-101 Photoionization detector (HNU) or MiniRae™ Photo-ionization detector or equivalent, which is factory, calibrated to benzene. The appropriate FID is a Foxboro model 128 Organic vapor Analyzer (OVA) or equivalent, which is factory calibrated to methane.

b. Application

Organic vapor monitoring is performed as outlined in the NYSDOH Community Air Monitoring Plan. Specifically, monitoring shall be conducted at the downwind perimeter of the work zone periodically during work activities. If TOV levels exceed 5 parts per million (ppm) above established pre-work background levels, work activities will be halted and monitoring will be continued under the provision of a Vapor Emission Response Plan (as outlined in the Community Air Monitoring Plan).

3.4 Worker Training

Personnel overseeing the drilling will be trained, fit-tested, and medically certified (OSHA 29 CFR 1910. 134). This includes the Health & Safety Coordinator or his/her properly trained assignee.

Prior to any work, all workers involved with the project should be aware of the potential chemical, physical and biological hazards discussed in this document, as well as the general safety practices outlined below. A safety briefing by the on-site HSC and/or assistant designee shall take place at the outset of work activities.

The HSC will be available to address project-related health & safety issues a site worker (such as an equipment operator or laborer) may have regarding the site conditions. Once an issue is brought to the HCS's attention, he or she will evaluate the issue and apply the procedures outlined in this Health & Safety Plan.

3.5 General Safety Practices

All project personnel shall follow the following safety practices:

1. Avoid unnecessary skin exposure to subsurface materials. Long-sleeved shirts tucked into long pants (or coveralls), work gloves, and steel-toe leather work boots are required unless modified gear is approved by the HSC. Remove any excess residual soil from clothes prior to leaving the site.

2. No eating, drinking, gum or tobacco chewing, or smoking allowed in designated work areas. Thoroughly wash hands prior to these activities outside the work area. Avoid sitting on the ground during breaks or while eating and drinking. Thoroughly wash all exposed body areas at the end of the workday.

3. Some symptoms of acute exposure include: nausea, dizziness, light-headedness, impaired coordination, headache, blurred vision, and nose/throat/eye irritation. If these symptoms are experienced or strong odor is detected, leave the work area and immediately report the incident to the on-site HSC.

3.6 Enforcement

Enforcement of the Site Safety Plan will be the responsibility of the HSC. The Coordinator should be on-site on a full-time basis and perform or directly oversee all aspects of Project Health & Safety operations including: air monitoring; environmental mitigation; personnel respiratory and skin protection; general safety practices; documentation; emergency procedures and protocol; and reporting and recordkeeping as described below.

3.7 Reporting and Recordkeeping

Incidents involving injury, symptoms of exposure, discovery of contained (potentially hazardous) materials, or unsafe work practices and/or conditions should be immediately reported to the HSC.

A log book must be maintained on-site to document all aspects of HASP enforcement. The log is paginated and dated with entries made on a daily basis in waterproof ink, initialed by the HSC or designee. Log entries should include date and time of instrument monitoring, instrument type, measurement method, test results, calibration and maintenance information, as well as appropriate mitigative actions responding to detections. Miscellaneous information to be logged may include weather conditions, reported complaints or symptoms, regulatory inspections, and reasons to upgrade personnel protection above the normal specification (Level D).

4.0 EMERGENCIES

4.1 EMERGENCY RESPONSE SERVICES

(1)	**HOSPITAL** Winthrop University Hospital 259 First Street Mineola, NY 11501 (See Figure 1 for Map Route)	**(516) 663-0333**
(2)	**AMBULANCE**	**911**
(3)	**FIRE DEPARTMENT** **HAZARDOUS MATERIAL**	**911**
(4)	**POLICE DEPARTMENT**	**911**
(5)	**POISON CONTROL CENTER**	**(800) 222-1222**

The preceding list and associated attached map (Figure 1) illustrating the fastest route to the nearest hospital must be conspicuously posted in areas of worker congregation and adjacent to all on-site telephones (if any).

4.2 EMERGENCY PROCEDURES

4.2.1 Contact or Exposure to Suspected Hazardous Materials

In the event of a fire, chemical discharge, medical emergency, workers are instructed to immediately notify the HSC and proper emergency services (posted). Should physical contact with unknown or questionable materials occur, immediately wash the affected body areas with clean water and notify the HSC. Anyone experiencing symptoms of exposure should exit the work area, notify the HSC, and seek medical attention.

4.2.2 Personnel Decontamination, First Aid, and Fire Protection

The first step in the treatment of skin exposure to most chemicals is to rinse the affected area with water. For this reason, adequate amounts of water and soap are maintained on-site in a clearly designated and readily-accessible location. Portable emergency eyewash stations and a first aid kit must be made available and maintained in the same locations as the potable water. Fire extinguishers are also to be maintained on-site in designated locations. All on-site personnel

are to be made aware of the locations of the above-mentioned on-site Health & Safety accommodations during the initial Health and Safety briefing.

4.2.3 Ingress/egress

Clear paths of ingress/egress to work zones and site entrances/exits must be maintained at all times. Unauthorized personnel are restricted from accessing the site.

5.0 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring, for volatile compounds and particulate levels at the perimeter of the work area is necessary. This plan includes the following:

- Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities must be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

- Particulates should be continuously monitored upwind, downwind and within the work area at temporary particulate monitoring stations during excavation activities. If the downwind particulate level is 150 µg/m^3 greater than the upwind particulate level, then dust suppression techniques must be employed. All readings must be recorded and be available for State (DEC & DOH) personnel to review.

Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities can resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities can resume provided:

- The organic vapor level 200 ft. downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If efforts to abate the emission source are unsuccessful and, if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect;

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in the Health and Safety Plan of the Work Plan will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

6.0 HEALTH AND SAFETY PLAN REFERENCES

1. American Conference Governmental Industrial Hygienists, 1989; Threshold Limit Values And Biological Exposure Indices, 111 Pp.

2. Geoenvironmental Consultants, Inc.; 1987; Safety & Operations At Hazardous Materials Sites

3. NIOSH Guide To Chemical Hazards, 1985, US Department Of Health And Human Services, Centers For Disease Control

4. US Department Of Labor Occupational Safety & Health Administration, 1989; Hazardous Waste Operations And Emergency Response Interim Final Rule, 29 CFR Part 1910

5. Sax, N. I. Dangerous Properties Of Industrial Materials; © 1984

7.0 KEY PERSONNEL

Responsibility	Name and Phone Number	Task Description
Project Manager	Stephen Malinowski (516) 576-8844	Oversee and coordinate all technical aspects for the project
Site Safety Officer	Jessica Proscia (516) 576-8844	Coordinate and inspect all health and safety operations from the project site
Client Representative	Laurence Gordon (516) 354-4308	
Project Manager Alternate	Eric Weinstock (516) 576-8844	
Site Safety Officer Alternate	Jason Cooper (516) 576-8844	

Figure 1

Hospital Route Map

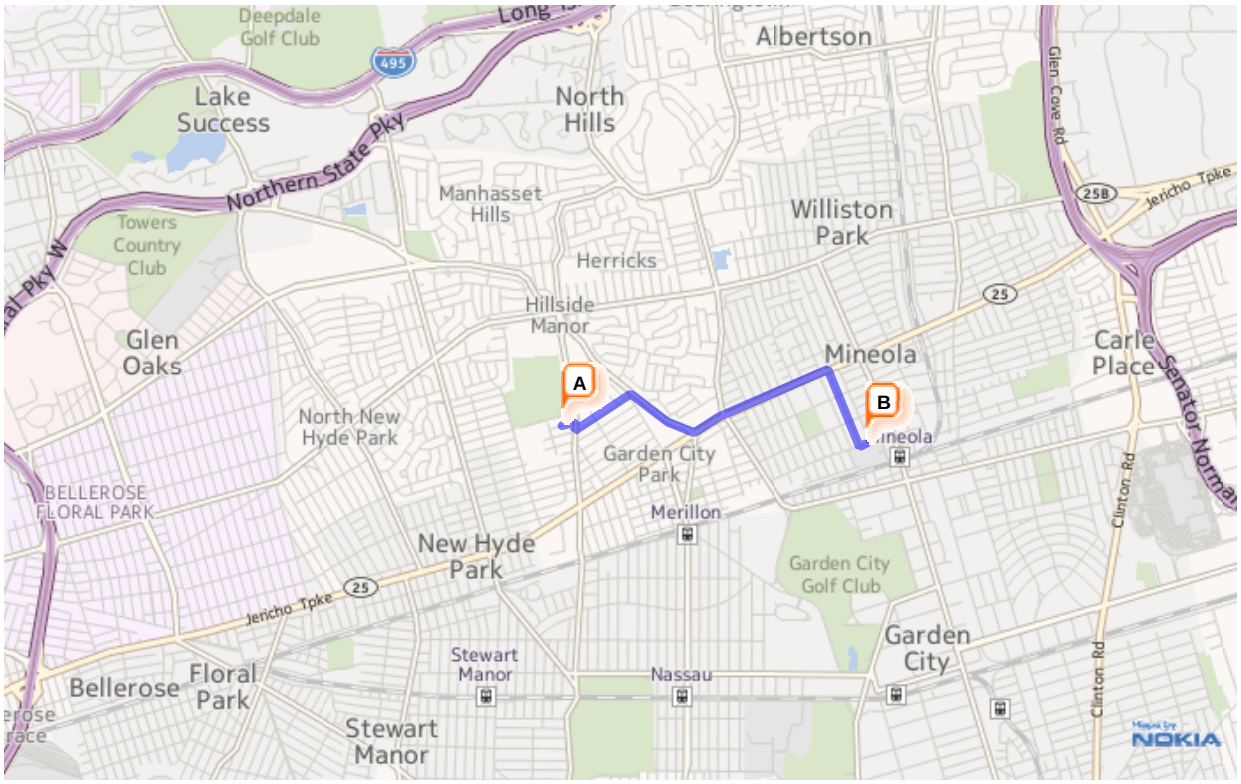
YAHOO! MAPS

Directions From 1801 Falmouth Avenue to Winthrop University Hospital. 259 First Street, Mineola, NY
516-663-0333

A **1801 Falmouth Ave, New Hyde Park, NY 11040-4028**

B **259 1st St, Mineola, NY 11501-3957**

Total Distance: **2.04 miles** — Total Time: **6 mins**



A **1801 Falmouth Ave, New Hyde Park, NY 11040-4028**		
1.	Head toward **Denton Ave** on **Falmouth Ave**.	Go for 370 ft.
2.	Turn **right** onto **Denton Ave**.	Go for 255 ft.
3.	Turn **left** onto **7th St**.	Go for 0.3 mi.
4.	Turn **right** onto **Marcus Ave**.	Go for 0.4 mi.
		Go for 0.7 mi.

5.		Bear **left** onto **Jericho Tpke (RT-25)**.	
6.		Turn **right** onto **Wellington Rd**.	Go for 0.4 mi.
7.		Turn **left** onto **1st St**.	Go for 180 ft.
8.		Your destination on **1st St** is on the **right**. **The trip takes 2.0 mi and 6 mins.**	

B **259 1st St, Mineola, NY 11501-3957**

When using any driving directions or map, its a good idea to double check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning

APPENDIX A

Physical Properties and Toxicological Information

MSDS Number: T4914 * * * * * *Effective Date: 05/26/09* * * * * *Supercedes: 07/06/06*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance

1,1,1-TRICHLOROETHANE

1. Product Identification

Synonyms: Methyl chloroform; trichloroethane; chlorotene
CAS No.: 71-55-6
Molecular Weight: 133.40
Chemical Formula: CH3CCl3
Product Codes: 9435, 9437, W509, W510

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Methyl Chloroform	71-55-6	96 - 100%	Yes
Dioxane	123-91-1	< 3%	Yes
1,2-Epoxybutane	106-88-7	< 0.5%	Yes
Actual concentrations proprietary			

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD. CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Cancer Causing)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Inhalation of vapors will irritate the respiratory tract. Affects the central nervous system. Symptoms include headache, dizziness, weakness, nausea. Higher levels of exposure (> 5000 ppm) can cause irregular heart beat, kidney and liver damage, fall in blood pressure, unconsciousness and even death.
Ingestion:
Harmful if swallowed. Symptoms similar to inhalation will occur along with nausea, vomiting. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal. If aspirated, may be rapidly absorbed through the lungs and result in injury to other body systems.
Skin Contact:
Causes mild irritation and redness, especially on prolonged contact. Repeated contact may cause drying or flaking of the skin.
Eye Contact:
Liquids and vapors cause irritation. Symptoms include tearing, redness, stinging, swelling.
Chronic Exposure:
Prolonged or repeated skin contact may cause dermatitis. Chronic exposure may affect the kidneys and liver. Dioxane is a suspected human carcinogen based on animal data.
Aggravation of Pre-existing Conditions:
Personnel with CNS, kidney, liver or heart disease may be more susceptible to the effects of this substance. Use of alcoholic beverages may aggravate symptoms.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Autoignition temperature: 500C (932F)
Flammable limits in air % by volume:
lel: 7.0; uel: 16.0
Vapors in containers can explode if subjected to high energy source.
Dioxane has a flash point below 16C (60F).
Explosion:
Can react with strong caustic, such as potash to form a flammable or explosive material. Air/vapor mixtures may explode when heated. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Combustion by-products include phosgene and hydrogen chloride gases. Structural firefighters' clothing provides only limited protection to the combustion products of this material.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! Do not use aluminum, magnesium or zinc metal for storage container. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not use aluminum equipment or storage containers. Contact with aluminum parts in a pressurized fluid system may cause violent reactions.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
350 ppm (TWA) for trichloroethane
100 ppm (TWA) skin for dioxane
-ACGIH Threshold Limit Value (TLV):
350 ppm (TWA), 450 ppm (STEL) for trichloroethane
20 ppm (TWA) skin, A3 - Animal Carcinogen for dioxane
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has questionable warning properties. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Viton is a recommended material for personal protective equipment.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Mild chloroform-like odor.
Solubility:
4,400 ppm in water @ 20C (68F)
Specific Gravity:
1.34 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
74C (165F)
Melting Point:
-32C (-26F)
Vapor Density (Air=1):
4.63
Vapor Pressure (mm Hg):
100 @ 20C (68F)
Evaporation Rate (BuAc=1):
12.8

10. Stability and Reactivity

Stability:
Requires inhibitor content to prevent corrosion of metals. Slowly hydrolyzes in water to form hydrochloric and acetic acid.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition. Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Polymerization:
Hazardous polymerization can occur in contact with aluminum trichloride.
Incompatibilities:
Open flames, welding arcs, nitrogen tetroxide, oxygen, liquid oxygen, sodium, sodium hydroxide, and sodium-potassium alloy, strong alkalis, oxidizers, aluminum and other reactive metals.
Conditions to Avoid:
Insufficient inhibitor, incompatibles, heat, flame and ignition sources

11. Toxicological Information

Oral rat LD50: 9600 mg/kg; inhalation rat LC50: 18000 ppm/4H; investigated as a mutagen, tumorigen, reproductive effector; irritation eye rabbit, Standard Draize, 2mg/24H severe.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Methyl Chloroform (71-55-6)	No	No	3
Dioxane (123-91-1)	No	Yes	2B
1,2-Epoxybutane (106-88-7)	No	No	2B

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. This material is not expected to significantly bioaccumulate. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released to the atmosphere, this material has an average global half-life of 6.0 - 6.9 years. When released into the air, this material may adversely affect the ozone layer.
Environmental Toxicity:
This material is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: 1,1,1-TRICHLOROETHANE
Hazard Class: 6.1
UN/NA: UN2831
Packing Group: III
Information reported for product/size: 20L

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------

Ingredient	TSCA	EC	Japan	Australia
Methyl Chloroform (71-55-6)	Yes	Yes	Yes	Yes
Dioxane (123-91-1)	Yes	Yes	Yes	Yes
1,2-Epoxybutane (106-88-7)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Methyl Chloroform (71-55-6)	Yes	Yes	No	Yes
Dioxane (123-91-1)	Yes	Yes	No	Yes
1,2-Epoxybutane (106-88-7)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\---------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Methyl Chloroform (71-55-6)	No	No	Yes	No
Dioxane (123-91-1)	No	No	Yes	No
1,2-Epoxybutane (106-88-7)	No	No	Yes	No

--------\Federal, State & International Regulations - Part 2\---------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Methyl Chloroform (71-55-6)	1000	U226	No
Dioxane (123-91-1)	100	U108	No
1,2-Epoxybutane (106-88-7)	100	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2[Z]
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 2 Flammability: 1 Reactivity: 0
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER, KIDNEYS, AND CARDIOVASCULAR SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. POSSIBLE CANCER HAZARD. CONTAINS DIOXANE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3.
Disclaimer:
****
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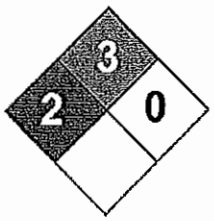
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

ScienceLab.com
Chemicals & Laboratory Equipment



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
1,1-Dichloroethane MSDS

Section 1: Chemical Product and Company Identification

Product Name: 1,1-Dichloroethane

Catalog Codes: SLD3280

CAS#: 75-34-3

RTECS: KI0175000

TSCA: TSCA 8(b) inventory: 1,1-Dichloroethane

CI#: Not available.

Synonym:

Chemical Name: 1,1-Dichloroethane

Chemical Formula: C2-H4-Cl2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{1,1-}Dichloroethane	75-34-3	100

Toxicological Data on Ingredients: 1,1-Dichloroethane: ORAL (LD50): Acute: 725 mg/kg [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified 2 (Reasonably anticipated.) by NTP. A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to kidneys, lungs, liver, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 458°C (856.4°F)

Flash Points: CLOSED CUP: -17°C (1.4°F). OPEN CUP: -6°C (21.2°F).

Flammable Limits: LOWER: 5.6% UPPER: 11.4%

Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents, alkalis.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 250 (ppm) from ACGIH (TLV) [1999] TWA: 100 (ppm) from OSHA (PEL) Australia: TWA: 200 (ppm) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Oily liquid.)

Odor: Chloroform like odor (Slight.)

Taste: Not available.

Molecular Weight: 98.96 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 57.3°C (135.1°F)

Melting Point: -96.9°C (-142.4°F)

Critical Temperature: 261.5°C (502.7°F)

Specific Gravity: 1.175 (Water = 1)

Vapor Pressure: 180 mm of Hg (@ 20°C)

Vapor Density: 3.44 (Air = 1)

Volatility: Not available.

Odor Threshold: 120 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties:
Partially dispersed in diethyl ether. See solubility in water, diethyl ether.

Solubility: Partially soluble in diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, alkalis.

Corrosivity: Corrosive in presence of aluminum.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Will attack some forms of plastic and rubber

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 725 mg/kg [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2 (Reasonably anticipated.) by NTP. A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to kidneys, lungs, liver, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:
CLASS 3: Combustible liquid with a flash point greater than 37.8C (100F). Marine pollutant

Identification: : 1,1-Dichloroethane : UN2362 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65 (no significant risk level): 1,1-Dichloroethane California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: 1,1-Dichloroethane Rhode Island RTK hazardous substances: 1,1-Dichloroethane Pennsylvania RTK: 1,1-Dichloroethane Florida: 1,1-Dichloroethane Minnesota: 1,1-Dichloroethane Massachusetts RTK: 1,1-Dichloroethane New Jersey: 1,1-Dichloroethane New Jersey spill list: 1,1-Dichloroethane TSCA 8(b) inventory: 1,1-Dichloroethane TSCA 8(a) PAIR: 1,1-Dichloroethane TSCA 8(d) H and S data reporting: 1,1-Dichloroethane: June 1999 TSCA 12(b) one time export: 1,1-Dichloroethane SARA 313 toxic chemical notification and release reporting: 1,1-Dichloroethane: 1% CERCLA: Hazardous substances.: 1,1-Dichloroethane: 1000 lbs. (453.6 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R22- Harmful if swallowed. R37/38- Irritating to respiratory system and skin. R41- Risk of serious damage to eyes. R52- Harmful to aquatic organisms.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 05:07 PM

Last Updated: 11/06/2008 12:00 PM

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1,1,-DICHLORETHYLENE- MATERIAL SAFETY DATA SHEET

TABLE OF CONTENTS:

24 Hour EMERGENCY CONTACT

U.S- CHEMTREC 1-800-424-9300

CANADA- CANUTEC 613-996-6666

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Up to Table of Contents

Matheson Tri-Gas, Inc.

The telephone numbers listed below are emergency numbers, please contact your local branch for routine inquiries.

USA	CANADA
959 Route 46 East	530 Watson Street
Parsippany, New Jersey	Whitby, Ontario
07054-0624 USA	L1N 5R9 Canada
Phone: 973-257-1100	**Phone:** 905-668-3570

SUBSTANCE: 1,1-DICHLOROETHYLENE

SYMBOL: $C_2H_2Cl_2$

TRADE NAMES/SYNONYMS:
1,1-DICHLOROETHENE; 1,1-DICHLOROETHYLENE; VDC; VINYLIDENE CHLORIDE MONOMER; VINYLIDENE DICHLORIDE; VINYLIDENE CHLORIDE, INHIBITED; RCRA U078; UN 1303; C2H2CL2; MAT25070; RTECS KV9275000

CHEMICAL FAMILY: halogens

CREATION DATE: Jan 24 1989
REVISION DATE: Mar 16 1999

2. COMPOSITION, INFORMATION ON INGREDIENTS

Up to Table of Contents

COMPONENT: 1,1-DICHLOROETHYLENE

CAS NUMBER: 75-35-4

EC NUMBER (EINECS): 200-864-0

PERCENTAGE: >99.9

COMPONENT: 4-METHOXYPHENOL

CAS NUMBER: 150-76-5

EC NUMBER (EINECS): 205-769-8

PERCENTAGE: 0.02000

3. HAZARDS IDENTIFICATION

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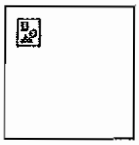
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=4 REACTIVITY=2

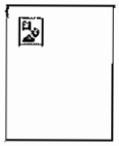


WHMIS CLASSIFICATION: BD2

EC CLASSIFICATION (ASSIGNED):
F+ Extremely Flammable
Xn Harmful

R 12-20-40

EC Classification may be inconsistent with independently-researched data.




EMERGENCY OVERVIEW:
Color: colorless

Physical Form: volatile liquid

Odor: faint odor, sweet odor

Major Health Hazards: harmful if swallowed, respiratory tract irritation, skin irritation, eye irritation, central nervous system depression

Physical Hazards: Flammable liquid and vapor. Vapor may cause flash fire. May polymerize. Containers may rupture or explode. May form peroxides during prolonged storage.

POTENTIAL HEALTH EFFECTS:

INHALATION:
Short Term Exposure: irritation, symptoms of drunkenness, lung congestion, liver damage, convulsions
Long Term Exposure: kidney damage, tumors

SKIN CONTACT:
Short Term Exposure: irritation (possibly severe)
Long Term Exposure: same as effects reported in short term exposure

EYE CONTACT:
Short Term Exposure: irritation (possibly severe), eye damage
Long Term Exposure:same as effects reported in short term exposure

INGESTION:
Short Term Exposure: same as effects reported in short term exposure
Long Term Exposure: same as effects reported in short term exposure

CARCINOGEN STATUS:
OSHA: N
NTP: N
IARC: N

4. FIRST AID MEASURES

Up to Table of Contents

INHALATION:
Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

SKIN CONTACT:
Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

EYE CONTACT:
Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

INGESTION:
If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention, if needed.

5. FIRE FIGHTING MEASURES

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FIRE AND EXPLOSION HAZARDS:
Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive above flash point. Containers may rupture or explode if exposed to heat.

EXTINGUISHING MEDIA:
alcohol resistant foam, carbon dioxide, regular dry chemical, water

Large fires: Use alcohol-resistant foam or flood with fine water spray.

FIRE FIGHTING:
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Water may be ineffective.

FLASH POINT:
14 F (-10 C)

LOWER FLAMMABLE LIMIT:
5.6%

UPPER FLAMMABLE LIMIT:
11.4%

AUTOIGNITION:
855 F (457 C)

FLAMMABILITY CLASS (OSHA):
IA

6. ACCIDENTAL RELEASE MEASURES

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AIR RELEASE:
Reduce vapors with water spray. Stay upwind and keep out of low areas.

SOIL RELEASE:
Dig holding area such as lagoon, pond or pit for containment. Dike for later disposal. Absorb with sand or other non-combustible material.

WATER RELEASE:
Collect with absorbent into suitable container. Collect spilled material using mechanical equipment.

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Reportable Quantity (RQ): Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

Up to Table of Contents

Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Store in a cool, dry place. Store in a well-ventilated area. Keep in the dark. Keep separated from incompatible substances. Store outside or in a detached building. Store with flammable liquids. Store in a tightly closed container. Containers must have overpressure release device. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances. Monitor inhibitor content. Avoid exposure to low temperatures or freezing. May form explosive peroxides. Store in a tightly closed container. Avoid contact with light. Store in a cool, dry place. Monitor inhibitor content. Do not evaporate or distill to dryness. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Up to Table of Contents

EXPOSURE LIMITS:
1,1-DICHLOROETHYLENE:
1 ppm (4 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
5 ppm (20 mg/m3) ACGIH TWA
20 ppm (80 mg/m3) ACGIH STEL

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from

NIOSH and/or OSHA.
At any detectable concentration -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Escape -
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

Up to Table of Contents

PHYSICAL STATE: liquid

COLOR: colorless

PHYSICAL FORM: volatile liquid

ODOR: faint odor, sweet odor

MOLECULAR WEIGHT: 96.64

MOLECULAR FORMULA: C2-H2-CL2

BOILING POINT: 86-90 F (30-32 C)

FREEZING POINT: -188 F (-122 C)

VAPOR PRESSURE: 400 mmHg @ 14.8 C

VAPOR DENSITY (air=1): 3.4

SPECIFIC GRAVITY (water=1): 1.213

WATER SOLUBILITY: 0.04% @ 20 C

PH: Not available

VOLATILITY: Not available

ODOR THRESHOLD: 500 ppm

EVAPORATION RATE: Not available

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

SOLVENT SOLUBILITY:
Soluble: organic solvents

10. STABILITY AND REACTIVITY

Up to Table of Contents

REACTIVITY:
May form explosive peroxides. Avoid contact with temperatures above -40 C. Avoid contact with heat, air, light or moisture and monitor inhibitor content. May polymerize. Closed containers may rupture violently.

CONDITIONS TO AVOID:
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES:
metals, acids, oxidizing materials

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: phosgene, halogenated compounds, oxides of carbon

POLYMERIZATION:
May polymerize. Avoid contact with heat or light and monitor inhibitor content.

11. TOXICOLOGICAL INFORMATION

Up to Table of Contents

VINYLIDENE CHLORIDE:

TOXICITY DATA:
6350 ppm/4 hour(s) inhalation-rat LC50; 200 mg/kg oral-rat LD50

CARCINOGEN STATUS:
IARC: Human Inadequate Evidence, Animal Limited Evidence, Group 3; ACGIH: A3 -Animal Carcinogen

LOCAL EFFECTS:
Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:
Toxic: ingestion
Slightly Toxic: inhalation

TARGET ORGANS:
central nervous system, liver

TUMORIGENIC DATA:
Available.

MUTAGENIC DATA:
Available.

REPRODUCTIVE EFFECTS DATA:
Available.

12. ECOLOGICAL INFORMATION

Up to Table of Contents

ECOTOXICITY DATA:

FISH TOXICITY:
74000 ug/L 96 hour(s) LC50 (Mortality) Bluegill (Lepomis macrochirus)

INVERTEBRATE TOXICITY:
224000 ug/L 96 hour(s) LC50 (Mortality) Opossum shrimp (Mysidopsis bahia)

ALGAL TOXICITY:
>712000 ug/L 96 hour(s) EC50 (Photosynthesis) Diatom (Skeletonema costatum)

ENVIRONMENTAL SUMMARY:
Moderately toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Up to Table of Contents

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U078. Hazardous Waste Number(s): D029. Dispose of in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the Regulatory level. Regulatory level- 0.7 mg/L. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

Up to Table of Contents

U.S. DOT 49 CFR 172.101. SHIPPING NAME-UN NUMBER; HAZARD CLASS; PACKING GROUP; LABEL:
Vinylidene chloride, inhibited-UN1303; 3; I; Flammable liquid

15. REGULATORY INFORMATION

Up to Table of Contents

U.S. REGULATIONS:
TSCA INVENTORY STATUS: Y

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CERCLA SECTION 103 (40CFR302.4): Y
1,1-Dichloroethylene: 100 LBS RQ

SARA SECTION 302 (40CFR355.30): N

SARA SECTION 304 (40CFR355.40): N

SARA SECTION 313 (40CFR372.65): Y
1,1-Dichloroethylene

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
ACUTE: Y
CHRONIC: Y
FIRE: Y
REACTIVE: Y
SUDDEN RELEASE: Y

OSHA PROCESS SAFETY (29CFR1910.119): N

STATE REGULATIONS:
California Proposition 65: N

EUROPEAN REGULATIONS:

EC NUMBER (EINECS): 200-864-0

EC RISK AND SAFETY PHRASES:

R 12	Extremely flammable.
R 20	Harmful by inhalation.
R 40	Possible risks of irreversible effects.
S 2	Keep out of reach of children.
S 7	Keep container tightly closed.
S 16	Keep away from sources of ignition - No smoking.
S 29	Do not empty into drains.

CONCENTRATION LIMITS:
C>=12.5% Xn R 20-40
1%<=C<12.5% Xn R 40

16. OTHER INFORMATION

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Linde Gas

Linde Gas LLC (216) 642-6600
P.O. Box 94737
Cleveland, Ohio 44101
www.us.lindegas.com

MATERIAL
SAFETY
DATA SHEET

No. 155

PRODUCT NAME Vinyl Chloride		CAS #	75-01-4
TRADE NAME AND SYNONYMS Vinyl chloride, inhibited (D.O.T.)		DOT I.D. No.:	UN 1086; RQ 1.0 (0.454)
CHEMICAL NAME AND SYNONYMS Vinyl Chloride, Chloroethylene; Chloroethene		DOT Hazard Class:	Division 2.1
		Formula	C_2H_3Cl or CH_2CHC
ISSUE DATES AND REVISIONS Revised january 1995		Chemical Family:	Halogenated Alkene

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT
TWA = 5 molar ppm with an A1 Carcinogen Rating (ACGIH 1994-1995). Al is a confirmed human carcinogen. OSHA 1993. 1910.1017, 8 Hr. TWA = 1 Molar PPM (Continued on Page 4)

SYMPTOMS OF EXPOSURE
Inhaling high concentrations causes mild symptoms of drowsiness, blurred vision, staggering gate and tingling and numbness in the extremities.

Liquid vinyl chloride may cause severe irritation or burns on skin or eye contact.

TOXICOLOGICAL PROPERTIES
Several workers who handled and used vinyl chloride developed a rare form of liver cancer.

IARC, NTP and OSHA all list vinyl chloride as a carcinogen.

Persons in ill health where such illness would be aggravated by exposure to vinyl chloride should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO VINYL CHLORIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

(Continued an Page 4)

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Vinyl chloride polymerizes on exposure to sunlight, heat or in the presence of oxygen or air. The addition of phenol or hydroquinone inhibits the polymerization. It is flammable in air.

PHYSICAL DATA

BOILING POINT 7.3°F (-13.7°C)	LIQUID DENSITY AT BOILING POINT 60.6 lb/ft³ (971 kg/m³)
VAPOR PRESSURE @ 70°F (21.1°C) = 52 psia (360 kPa)	GAS DENSITY AT 70°F, 1 atm @ 77°F (25°C) = .164 lb/ft³ (2.63 kg/m³)
SOLUBILITY IN WATER Slightly Soluble	FREEZING POINT -244.8°F (-153.8°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 77°F (25°C) = 2.22
APPEARANCE AND ODOR Colorless gas with a pleasant, sweet odor	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) -108°F (CC)	AUTO IGNITION TEMPERATURE 882°F (472°C)	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL 3.6 UEL 33
EXTINGUISHING MEDIA Water, dry chemical, carbon dioxide		ELECTRICAL CLASSIFICATION Class 1, Group Not Specified

SPECIAL FIRE FIGHTING PROCEDURES
Attempt to stop the flow of vinyl chloride. Use water spray to cool surrounding containers.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Vinyl chloride vapors are heavier than air and may travel a considerable distance to a source of ignition. Should fire be extinguished and flow of gas continue, increase ventilation to prevent formation of flammable mixtures in low areas or pockets.

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	

INCOMPATIBILITY (Materials to avoid) Oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS None

HAZARDOUS POLYMERIZATION May Occur	X	CONDITIONS TO AVOID It is inhibited with phenol or hydroquinone to prevent polymerization.
Will Not Occur		

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD
Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)	Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.	
VENTILATION Hood with forced ventilation	LOCAL EXHAUST To prevent accumulation above the TWA	SPECIAL N/A
	MECHANICAL (Gen.) In accordance with electrical codes	OTHER N/A
PROTECTIVE GLOVES Most materials except natural rubber		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower, eyewash "fountain," transparent face shield		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Vinyl chloride, inhibited
DOT Shipping Label: Flammable Gas
I.D. No.: UN 1086; RQ 1.0(0.454)
DOT Hazard Class: Division 2.1

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connectinn cylinder to lower pressure (<150 psiq) pipinq or systems. Do not heat cylinder by any means to increase tne discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult Compressed Gas Association's Pamphlets I P-1 and P-10.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits.

Do not allow the temperature where cylinders are stored to exceed 125F (52C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders beins stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1 and P-10.

SPECIAL PACKAGING RECOMMENDATIONS

Most metals except copper and its alloys may be used with vinyl chloride. Copper and its alloys could form explosive acetylides by reacting with the acetylene impurity in the product.

Teflon® is the preferred gasketing material.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Earth-ground and bond all lines and equipment associated with the vinyl chloride system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of federal Law (49CFR).

(Continued on Page 4)

*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

HEALTH HAZARD DATA

TWA DATA: (continued)

(<5 Molar PPM averaged over any period not exceeding 15 minutes) with the prohibition of any personal direct contact with vinyl chloride liquid and it is classified as a cancer suspect agent.

RECOMMENDED FIRST AID TREATMENT: (Continued)

Eye Contact: PERSONS WITH POTENTIAL EXPOSURE TO VINYL CHLORIDE SHOULD NOT WEAR CONTACT LENSES.

Flush contaminated eye(s) with copious quantities of water. Part eyelids with fingers to assure complete flushing. Continue for minium of 15 minutes. An eye specialict should be summoned promptly.

Skin Contact: Flush affected areas with copious quantities of water. Remove affected clothing as rapidly as possible. A physician should see the patient. Follow the water flush with a soap and water wash.

SPECIAL PRECAUTIONS.

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. Never transport cylinders in trunks OT vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cyclinders secured in open flatbed or in open pick-up type vehicles.

Vinyl chloride is a toxic chemical and it is subject to the reporting requirements of SARA, Title III, Section 313.

Material Safety Data Sheet

Ethyl Chloride

Section 1. Chemical product and company identification

Product name	: Ethyl Chloride
Supplier	: AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Product use	: Synthetic/Analytical chemistry.
Synonym	: Ethane, chloro-; Aethylis; Aethylis chloridum; Anodynon; Chelen; Chlorene; Chlorethyl; Chloridum; Chloroethane; Chloryl; Chloryl anesthetic; Cloretilo; Dublofix; Ether chloratus; Ether hydrochloric; Ether muriatic; Hydrochloric ether; Kelene; Monochlorethane; Monochloroethane; Muriatic ether; Narcotile; C2H5Cl; Aethylchlorid; Chloorethaan; Chloroaethan; Chlorure D'ethyle; Cloroetano; Cloruro di etile; Etylu chlorek; NCI-C06224; UN 1037; Aethylisaethylis chloridum; Chloryle anesthetic; 1-Chloroethane
MSDS #	: 001023
Date of Preparation/Revision	: **4/26/2010.**
In case of emergency	: 1-866-734-3438

Section 2. Hazards identification

Physical state	: Gas. [COLORLESS LIQUID OR GAS WITH A PUNGENT, ETHER-LIKE ODOR]
Emergency overview	: WARNING! FLAMMABLE GAS. MAY CAUSE FLASH FIRE. MAY CAUSE EYE AND SKIN IRRITATION. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. CONTENTS UNDER PRESSURE. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Avoid contact with eyes, skin and clothing. May cause target organ damage, based on animal data. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed. Contact with rapidly expanding gases can cause frostbite.
Target organs	: May cause damage to the following organs: kidneys, liver, mucous membranes, cardiovascular system, upper respiratory tract, skin, eyes, central nervous system (CNS).
Routes of entry	: Inhalation Dermal Eyes
Potential acute health effects	
Eyes	: Moderately irritating to eyes. Contact with rapidly expanding gas may cause burns or frostbite.
Skin	: Moderately irritating to the skin. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	: Acts as a simple asphyxiant.
Ingestion	: Ingestion is not a normal route of exposure for gases
Potential chronic health effects	: **CARCINOGENIC EFFECTS:** Classified + (Proven.) by NIOSH. Classified A3 (Proven for animals.) by ACGIH, 3 (Possible for humans.) by European Union. 3 (Not classifiable for humans.) by IARC. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available.
Medical conditions aggravated by over-exposure	: Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

Ethyl Chloride

See toxicological information (section 11)

Section 3. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
Ethyl Chloride	75-00-3	100	**ACGIH TLV (United States, 1/2009).** **Absorbed through skin.** TWA: 264 mg/m³ 8 hour(s). TWA: 100 ppm 8 hour(s). **OSHA PEL (United States, 11/2006).** TWA: 2600 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** TWA: 2600 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s).

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training.If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : As this product is a gas, refer to the inhalation section.

Section 5. Fire-fighting measures

Flammability of the product : Flammable.

Auto-ignition temperature : 518.75°C (965.8°F)

Flash point : Closed cup: -50.15°C (-58.3°F).

Flammable limits : Lower: 3.8% Upper: 15.4%

Products of combustion : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
carbonyl halides

Fire hazards in the presence of various substances : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat and oxidizing materials.

Fire-fighting media and instructions : In case of fire, use water spray (fog), foam or dry chemical.

In case of fire, allow gas to burn if flow cannot be shut off immediately. Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.

Contains gas under pressure. Flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Handling : Use only with adequate ventilation. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Keep container closed. Avoid contact with skin and clothing. Avoid contact with eyes. Keep away from heat, sparks and flame. To avoid fire, eliminate ignition sources. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Storage : Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Segregate from oxidizing materials. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

Product name

chloroethane

ACGIH TLV (United States, 1/2009). Absorbed through skin.
TWA: 264 mg/m³ 8 hour(s).
TWA: 100 ppm 8 hour(s).
OSHA PEL (United States, 11/2006).
TWA: 2600 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).
OSHA PEL 1989 (United States, 3/1989).
TWA: 2600 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight	: 64.52 g/mole
Molecular formula	: C2-H5-Cl
Boiling/condensation point	: 12.2°C (54°F)
Melting/freezing point	: -138.9°C (-218°F)
Critical temperature	: 187.3°C (369.1°F)
Vapor density	: 2.2 (Air = 1)
Specific Volume (ft ^{3}/lb)	: 6.0241
Gas Density (lb/ft ^{3})	: 0.166

Section 10. Stability and reactivity

Stability and reactivity	: The product is stable.
Incompatibility with various substances	: Extremely reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Product/ingredient name	Result	Species	Dose	Exposure
chloroethane	TDLo Oral	Rat	250 mg/kg	-
	LC50 Inhalation Vapor	Rat	152 g/m3	10 minutes
	LC50 Inhalation Vapor	Rat	152 g/m3	2 hours
	LC50 Inhalation Vapor	Rat	150000 mg/m3	2 hours

IDLH : 3800 ppm

Chronic effects on humans : **CARCINOGENIC EFFECTS:** Classified + (Proven.) by NIOSH. Classified A3 (Proven for animals.) by ACGIH, 3 (Possible for humans.) by European Union. 3 (Not classifiable for humans.) by IARC.
May cause damage to the following organs: kidneys, liver, mucous membranes, cardiovascular system, upper respiratory tract, skin, eyes, central nervous system (CNS).

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects	: No known significant effects or critical hazards.
Mutagenic effects	: No known significant effects or critical hazards.
Reproduction toxicity	: No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Products of degradation : Products of degradation: carbon oxides (CO, CO_2) and water, halogenated compounds.

Environmental fate : Not available.

Environmental hazards : No known significant effects or critical hazards.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1037	ETHYL CHLORIDE	2.1	Not applicable (gas).		**Reportable quantity** 100 lbs. (45.4 kg) **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: 150 kg **Special provisions** B77, T50
TDG Classification	UN1037	ETHYL CHLORIDE	2.1	Not applicable (gas).		**Explosive Limit and Limited Quantity Index** 0.125 **ERAP Index** 3000 **Passenger Carrying Road or Rail Index** Forbidden
Mexico Classification	UN1037	ETHYL CHLORIDE	2.1	Not applicable (gas).		-

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 15. Regulatory information

United States

U.S. Federal regulations : **United States inventory (TSCA 8b):** This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: chloroethane
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: chloroethane: Fire hazard, reactive, Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: chloroethane

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: chloroethane

Clean Air Act (CAA) 112 regulated flammable substances: chloroethane

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	: Ethyl Chloride	75-00-3	100
Supplier notification	: Ethyl Chloride	75-00-3	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : **Connecticut Carcinogen Reporting:** This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.
Rhode Island Hazardous Substances: This material is not listed.

California Prop. 65 : **WARNING:** This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Ethyl Chloride	Yes.	No.	Yes.	No.

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

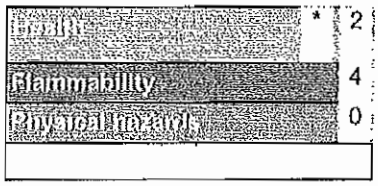
United States

Label requirements : FLAMMABLE GAS.
MAY CAUSE FLASH FIRE.
MAY CAUSE EYE AND SKIN IRRITATION.
MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

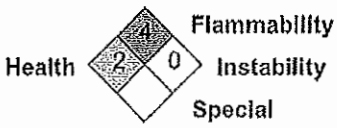
Canada

Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.

Hazardous Material Information System (U.S.A.) :



National Fire Protection Association (U.S.A.) :



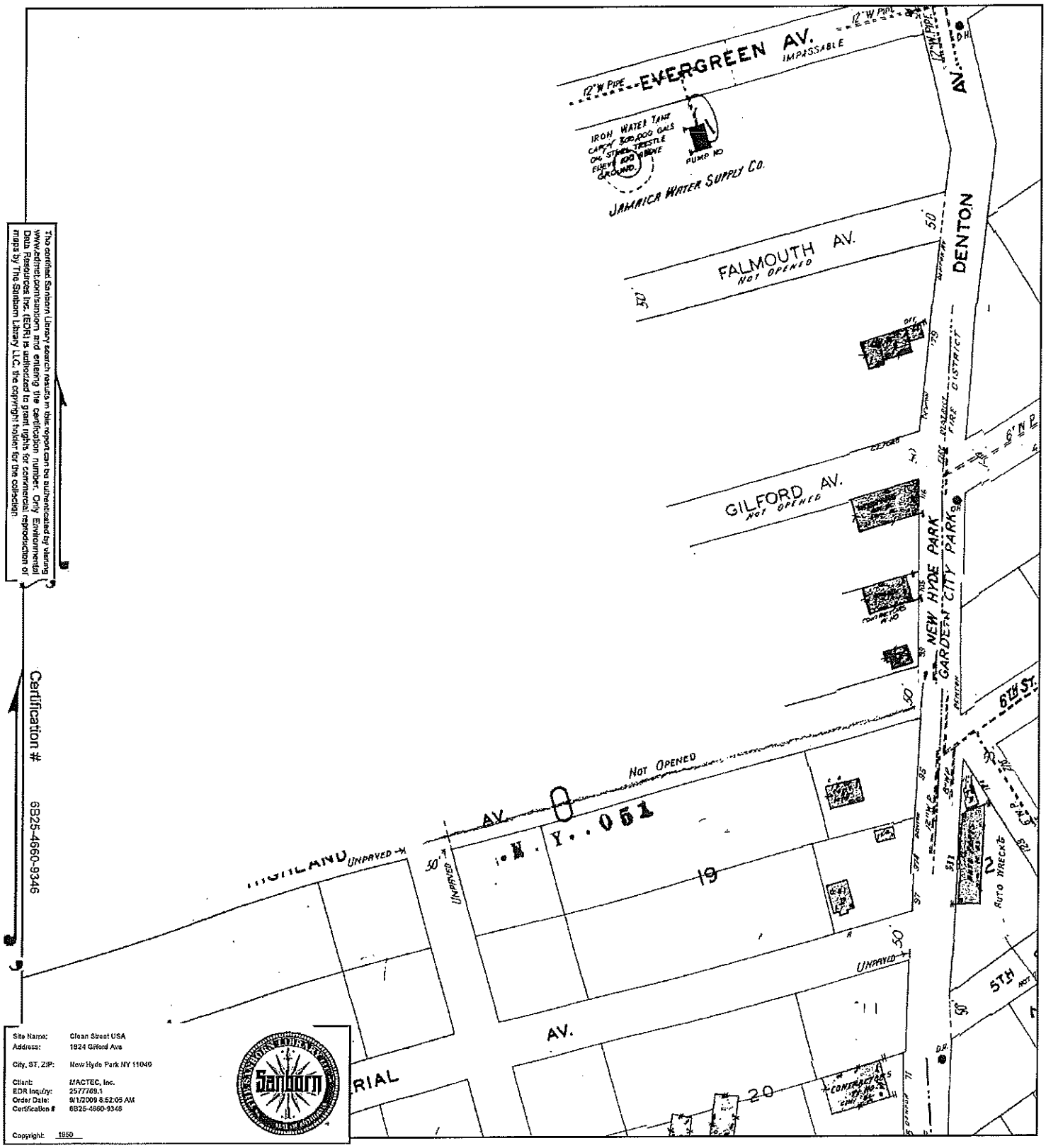
Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Appendix C

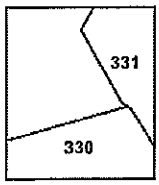
Sanborn Maps & Historical Documents

1950 Certified Sanborn Map



This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

Volume 3, Sheet 330
Volume 3, Sheet 331



0 Feet 150 300 600

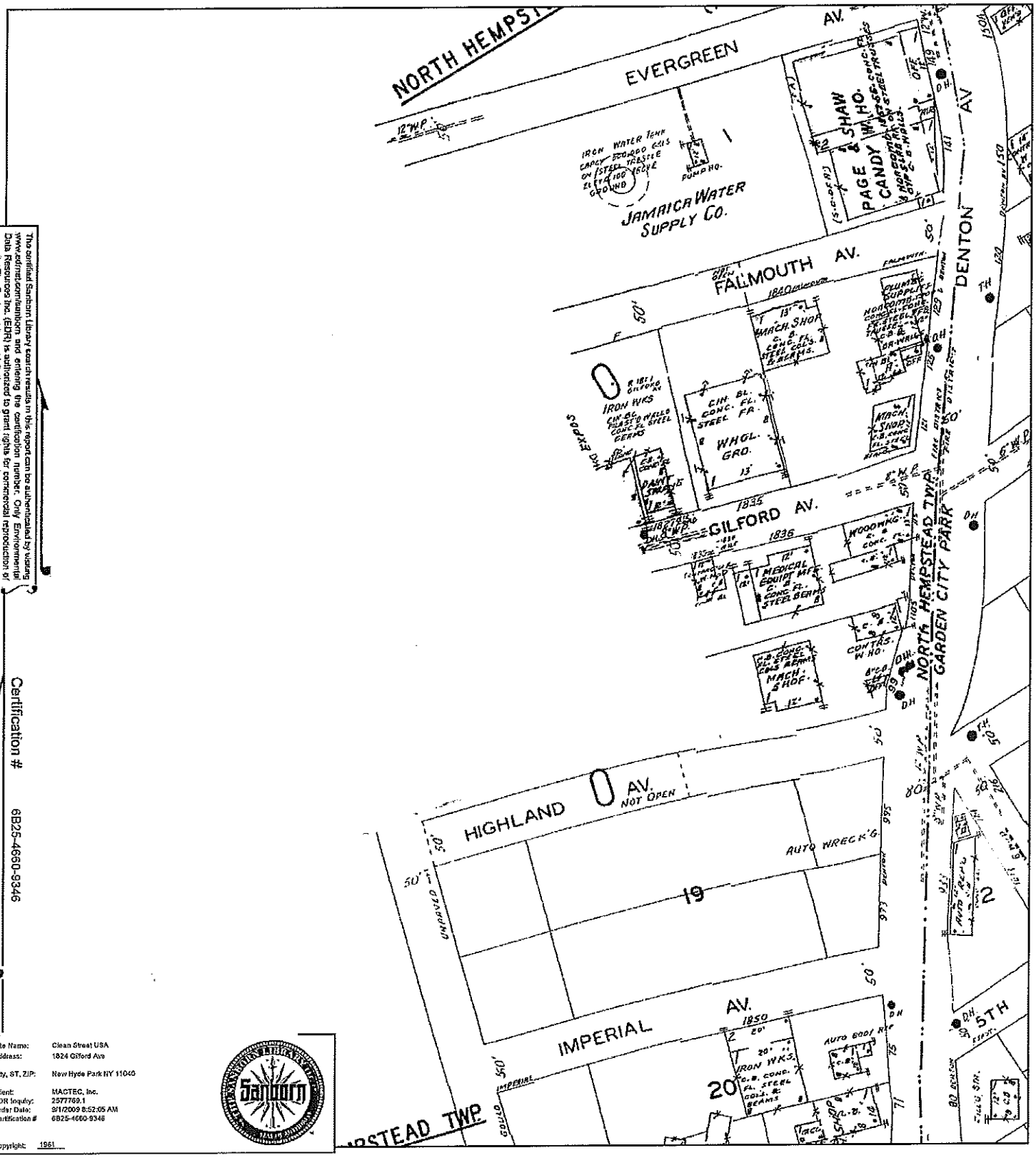
N

Certification # 6525-4660-9346

Site Name: Clean Street USA
Address: 1824 Gilford Ave
City, ST, ZIP: New Hyde Park NY 11040
Client: MACTEC, Inc.
EDR Inquiry: 2577769.1
Order Date: 9/1/2009 8:52:05 AM
Certification #: 6525-4660-9346

Copyright: 1950

1961 Certified Sanborn Map



Certification # 6B25-4660-9346

Site Name: Clean Street USA
Address: 1824 Gilford Ave
City, ST, ZIP: New Hyde Park NY 11040
Client: HACTEC, Inc.
EDR Inquiry: 2577769.1
Order Date: 9/1/2009 8:52:05 AM
Certification #: 6B25-4660-9346

Copyright: 1961

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

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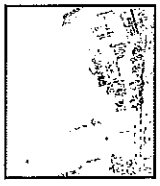

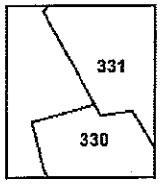

Volume 3, Sheet 330
Volume 3, Sheet 331

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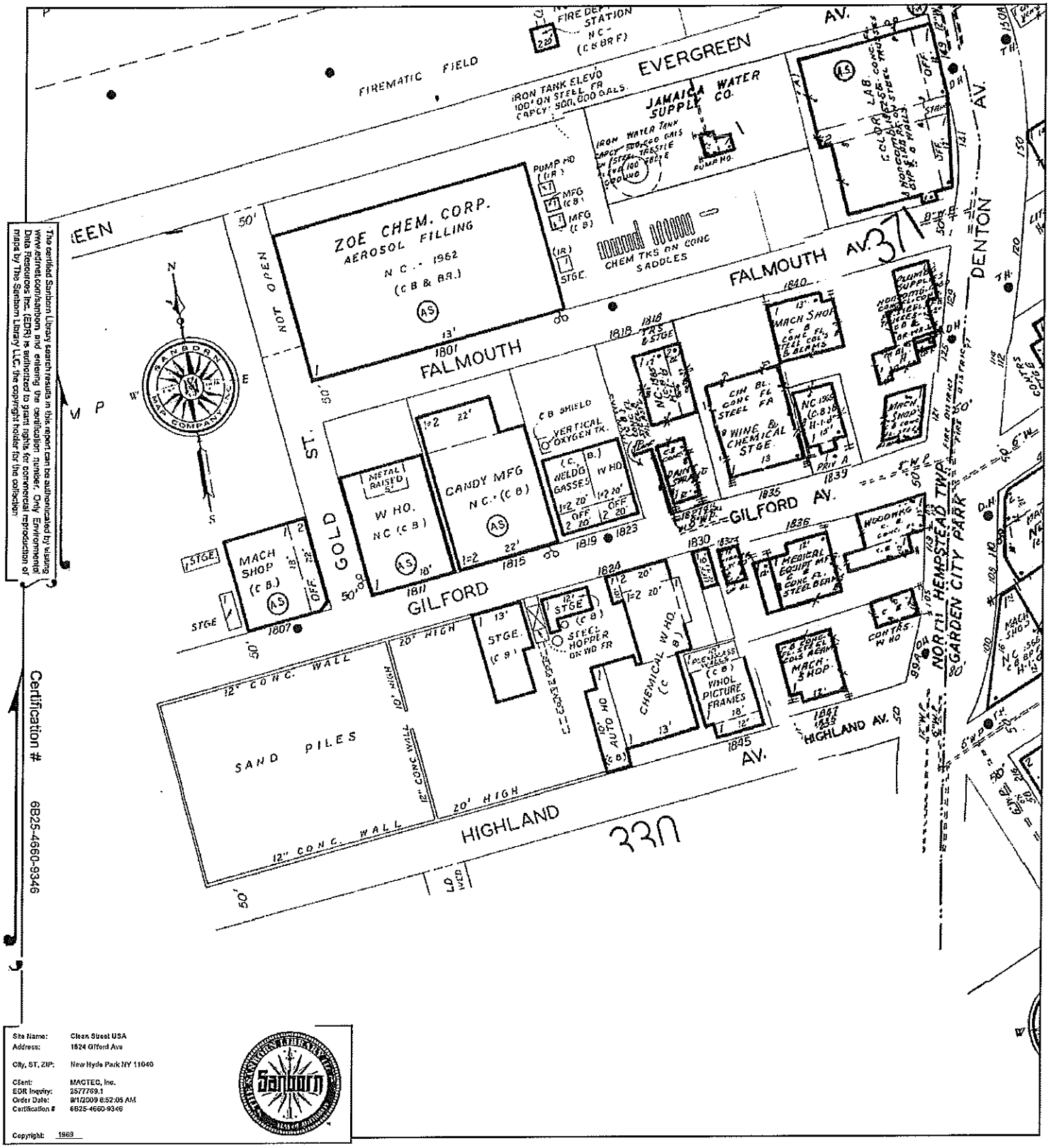
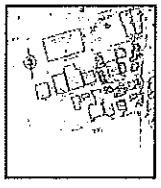
1969 Certified Sanborn Map

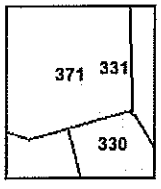


Certification # 6B25-4660-9346

Site Name:	Clean Street USA
Address:	1824 Gilford Ave
City, ST, ZIP:	New Hyde Park NY 11040
Client:	MACTEC, Inc.
EDR Inquiry:	2577769.1
Order Date:	9/1/2009 8:52:05 AM
Certification #	6B25-4660-9346
Copyright:	1969

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).



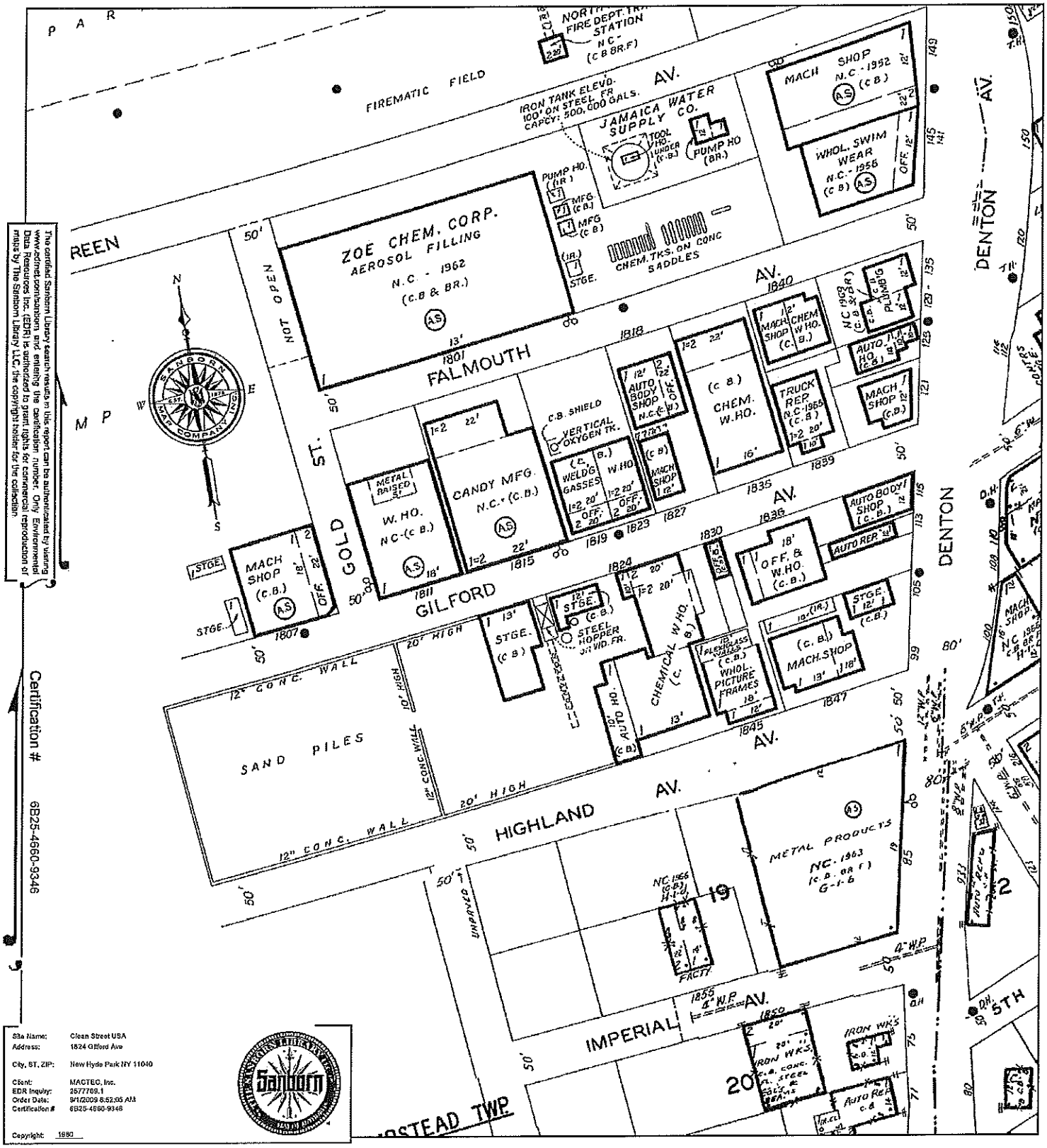


Volume 3, Sheet 330
Volume 3, Sheet 331
Volume 3, Sheet 371

0 Feet 150 300 600

N

1980 Certified Sanborn Map

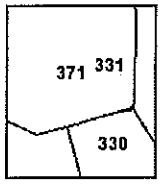


Certification # 6B25-4660-9346

Site Name: Clean Street USA
Address: 1824 Gilford Ave
City, ST, ZIP: New Hyde Park NY 11040
Client: MACTEC, Inc.
EDR Inquiry: 2577769.1
Order Date: 9/1/2009 8:52:05 AM
Certification #: 6B25-4660-9346

Copyright: 1980

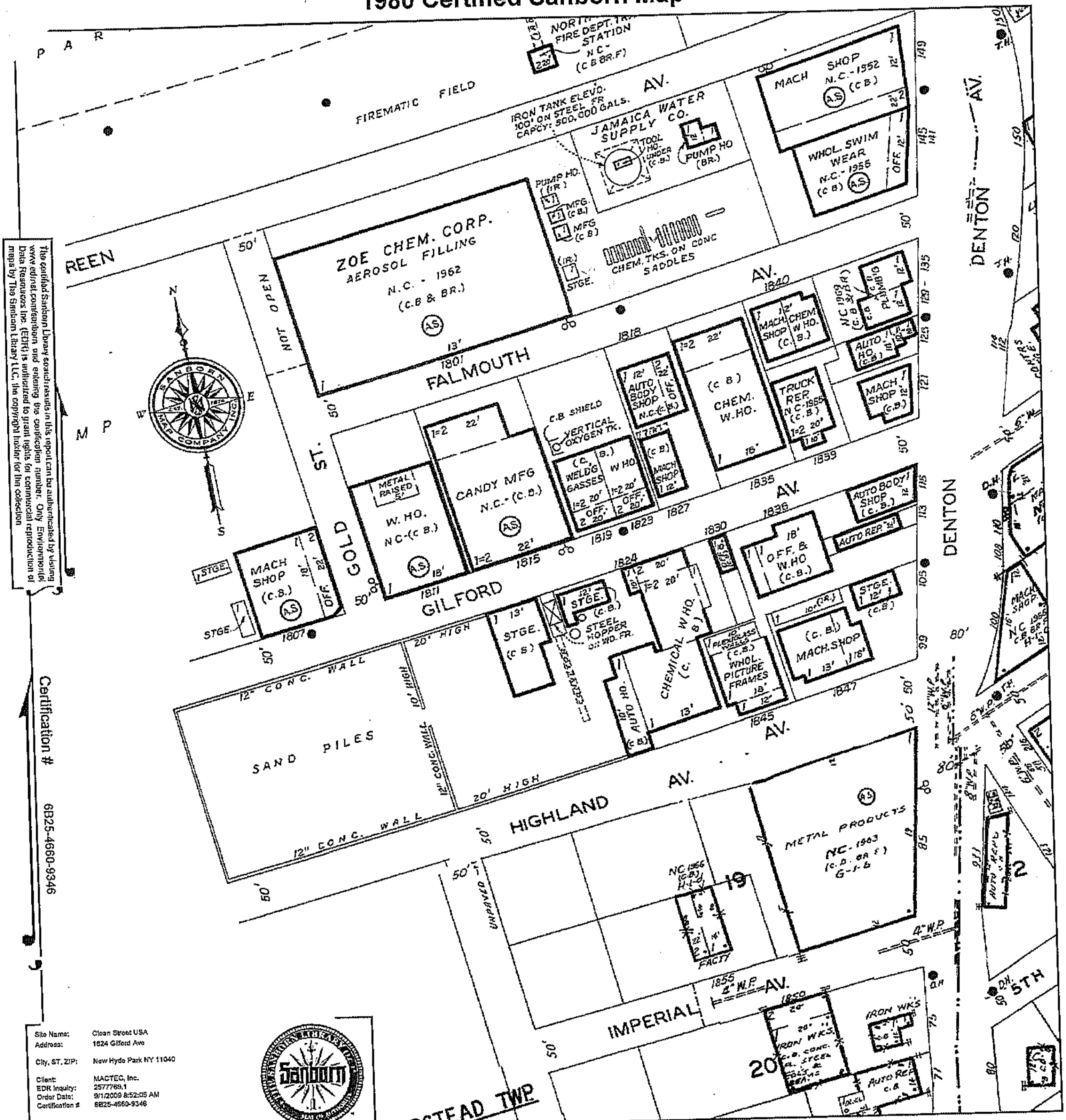
This Certified Sanborn Map combines the following sheets (thumbnails on page 3).



Volume 1, Sheet 330
Volume 1, Sheet 331
Volume 1, Sheet 371

0 Feet 150 300 600

1980 Certified Sanborn Map



Certification # 6B25-4660-9346

Site Name: Clean Street USA
Address: 1824 Gilford Ave
City, ST, ZIP: New Hyde Park NY 11040
Client: MACTEC, Inc.
EDR Inquiry: 2577769.1
Order Date: 9/1/2009 8:52:05 AM
Certification #: 6B25-4660-9346

0 Feet 150 300 600

This Certified Sanborn Map combines the following sheets (thumbnails on page 3).

371 331 330

Volume 1, Sheet 330
Volume 1, Sheet 331
Volume 1, Sheet 371

N

212-347-6900
516-354-1043

ZOË CHEMICAL CO., INC.
MANUFACTURERS OF
HOUSEHOLD & INDUSTRIAL CHEMICALS
1801 FALMOUTH AVE., NEW HYDE PARK, N. Y. 11040

7/31/78

NASSAU COUNTY DEPT. OF PUBLIC HEALTH
BUREAU OF WASTE WATER MANAGEMENT
240 OLD COUNTRY ROAD
MINEOLA,N.Y.

Dear Mr. Mangino;

As per our phone conversation please be advised that I have just spoken to the Nassau County Dept. of Public Works(Sewers & Sanitation)a Mr. Burke who advised that he is sending me an application for us to fill out to have our system connected to the Nassau County Sewer line. Upon reciept of our application he will let us know what will happen next. I will keep you informed as they do. Thank you.

Very truly yours;
Neil Axelrod
NEIL AXELROD

FILE ART II

718-347-6900
516-354-1043

ZOË CHEMICAL CO., INC.

MANUFACTURERS OF
HOUSEHOLD & INDUSTRIAL CHEMICALS
1801 FALMOUTH AVE., NEW HYDE PARK, N. Y. 11040

NASSAU COUNTY DEPT. OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA,N.Y. 11501

4/7/88

Dear Mr. Sekreta;

This will confirm our meeting on 4/7/88 of the following;

1) Zoe Chemical Company has an E.P.A. I.D. # NYD002033108.

2) Marine Pollution Control,Inc. will be doing our removal of waste material. This should be completed by the end of next week.

3) Orchard Sewer Company will be making the sewer connection within the next 2 weeks.

Very truly yours;
NEIL AXELROD

TANK & ENVIRONMENTAL SERVICES

October 2, 1992

Mr. Tom Norris
Nassau County Dept. Of Health
240 Jericho Tpke.
Mineola, NY 11501

Zoe Chem

Re: 1801 Falmouth, New Hyde Park

Gentlemen:

Wrong!

Enclosed herewith please find a copy of the results for the tank test taken at the above mentioned location on September 28, 1992. Results are as follows:

Tank Identification:	Fac. I.D. 01214
Type of Test:	Horner Ezy-Check
Date of Test:	September 28, 1992
Type of Fuel:	#2 Fuel Oil
Leakage Indicated:	.-017/Passed
Contamination Found:	None

ID S/B 01006

If you have any questions or require any further information please contact the undersigned.

Sincerely,

Tricia Macrelli

111 Dale Street • West Babylon, New York 11704 • TEL: (516) 249-5443 • FAX: (516) 249-3798

DATA CHART FOR TANK SYSTEM TIGHTNESS TEST
(EZY CHEK)

NK-BOILER-ENVIRONMENTAL SERVICES
RESIDENTIAL • COMMERCIAL • INDUSTRIAL

CLIENT
NAME OF SUPPLIER, OWNER OR DEALER: Gordon
ADDRESS (NO. & STREET): 181 Falmouth
CITY AND STATE: New Hyde Park

DATE OF TEST: 9-28-92
WEATHER: Cloudy
TEMPERATURE: 60's

TANK INFORMATION
CAPACITY (NOMINAL): 2000 GALS.
CAPACITY (CHART): ____ GALS.
DIMENSIONS: DIAMETER 64
LENGTH: ____

SIZE OF FILL OR TEST OPENING: 2 IN.
TOP OFF TIME: ____ GALLONS: ____
NUMBER OF GALLONS ADDED TO START TEST: 5
TANK NO.: ____
INCHES OF WATER – BEFORE TEST: 0" AFTER TEST: 0"

CONTENTS (PRODUCT): #2
TANK MATERIAL: Steel
APPROX. AGE: ____
PUMP SYSTEM (TYPE): Suction

TEST CALIBRATION
SIZE OF CAL. BAR OR ML'S ADDED: .05 ÷ 30 (ALM) = .00166 (FACTOR A)

LINE MOVEMENT

1	6	to 36	= 30	LINES
2	36	to 66	= 30	LINES
3	66	to 96	= 30	LINES
TOTAL			90	LINES ÷ 3 = 30 (ALM) LINES

END OF TEST CALIBRATION
SIZE OF CAL. BAR OR ML'S ADDED: ____ ÷ ____ (ALM) = ____ (FACTOR A)

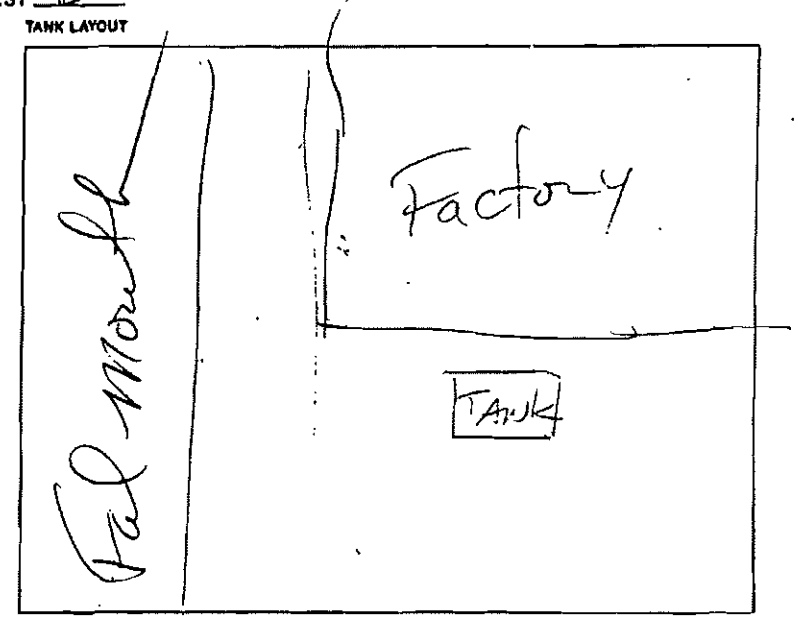
LINE MOVEMENT

1	____	to ____	= ____	LINES
2	____	to ____	= ____	LINES
3	____	to ____	= ____	LINES
TOTAL			____	LINES ÷ 3 = ____ (ALM) LINES

MEASURED API SPECIFIC GRAVITY: 34
PRODUCT TEMPERATURE: 66
API SPECIFIC GRAVITY @ 60° F: 33.6 (FROM TABLE A)
COEFFICIENT OF EXPANSION: .00045714 (FROM TABLE B)

.00045714 (C.O.E.) × 2008 (TOTAL CAPACITY (GAL.)) = 9179 (VOL. CHANGE/° F) (FACTOR B)

TANK LAYOUT

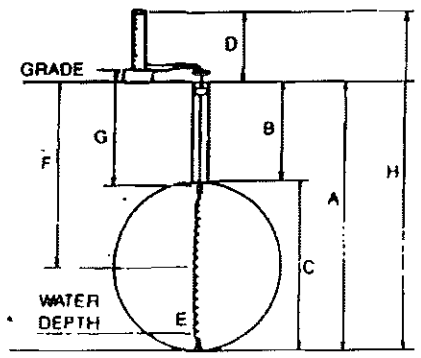


ADDITIONAL NOTES OR COMMENTS

TECHNICIAN(S): [signature] DATE: 9-28-92

DATA CHART FOR TANK SYSTEM TIGHTNESS TEST
(EZY CHEK)

Time (Military)	Reading No.	PRODUCT MONITORING ON LLR Start	End	+Gain -Loss	X Factor A	Product +Gain -Loss	TEMPERATURE COMPENSATION A Start	End	+Gain -Loss	X Factor B	Product +Gain -Loss	TEMPERATURE COMPENSATION B Start	End	+Gain -Loss	X Factor B	+Expansion -Contraction	NET VOL. CHANGE	LLR
1631	0	96	83	-13	.00166	-.0215						401	.898	-.003	9179	-.0027	-.0188	
1641	2	83	73	-10	.00166	-.0166						.898	.895	-.003	9179	-.0027	-.0139	
1646	3	73	63	-10	.00166	-.0166						.895	.891	-.004	9179	-.0036	-.0130	
1651	4	63	53	-10	.00166	-.0166						.891	.887	-.004	9179	-.0036	-.0130	
1656	5	53	45	-8	.00166	-.0132						.887	.884	-.003	9179	-.0027	-.0105	
1701	6	45	38	-7	.00166	-.0116						.884	.880	-.004	9179	-.0036	-.0080	
1706	7	38	30	-8	.00166	-.0132						.880	.876	-.004	9179	-.0036	-.0096	
1711	8	30	23	-7	.00166	-.0116						.876	.872	-.004	9179	-.0036	-.0080	
1716	9	23	15	-8	.00166	-.0132						.872	.868	-.004	9179	-.0036	-.0096	
1721	10	100	91	-9	.00166	-.0149						.868	.864	-.004	9179	-.0036	-.0113	
1726	11	91	83	-8	.00166	-.0132						.864	.860	-.004	9179	-.0036	-.0096	
1731	12	83	76	-7	.00166	-.0116						.860	.856	-.004	9179	-.0036	-.0130	
1736	13	76	71	-5	.00166	-.0083						.856	.853	-.003	9179	-.0027	-.0056	
1741	14	71	64	-7	.00166	-.0116						.853	.849	-.004	9179	-.0036	-.0130	
1746	15	64	58	-6	.00166	-.0099						.849	.845	-.004	9179	-.0036	-.0063	
1751	16	58	54	-4	.00166	-.0066						.845	.841	-.004	9179	-.0036	-.0030	
1756	17	54	50	-4	.00166	-.0066						.841	.838	-.003	9179	-.0027	-.0039	
1801	18	50	49	-1	.00166	-.0017						.838	.835	-.003	9179	-.0027	+.0011	
1806	19	49	49	0	.00166	0						.835	.831	-.004	9179	-.0036	+.0036	
1811	20	49	46	-3	.00166	-.0049						.831	.827	-.004	9179	-.0036	+.0013	
1816	21	46	40	-6	.00166	-.0099						.827	.823	-.004	9179	-.0036	+.0063	
1821	22	40	40	0	.00166	0						.823	.819	-.004	9179	-.0036	+.0036	
1826	23	40	40	0	.00166	0						.819	.816	-.003	9179	-.0027	+.0027	.0414
1831	24	40	40	0	.00166	0						.816	.813	-.003	9179	-.0027	+.0027	.0257
1836	25	40	40	0	.00166	0						.813	.810	-.003	9179	-.0027	+.0027	.0174



A.	Tank Bot. to Grade	89 "
B.	Tank Top to Grade.	25 "
C.	Tank Diameter	64 "
D.	Test Level above grade	45 "
E.	Depth of water in tank	0 "
F.	Depth for taking sample	57 "
G.	Temp. Probe depth (connector)	25 "
H.	Test level to Tank Bot.	134 "
I.	Groundwater above tank bottom	0 "
J.	Product Pressure per 1" height	.031 PSI

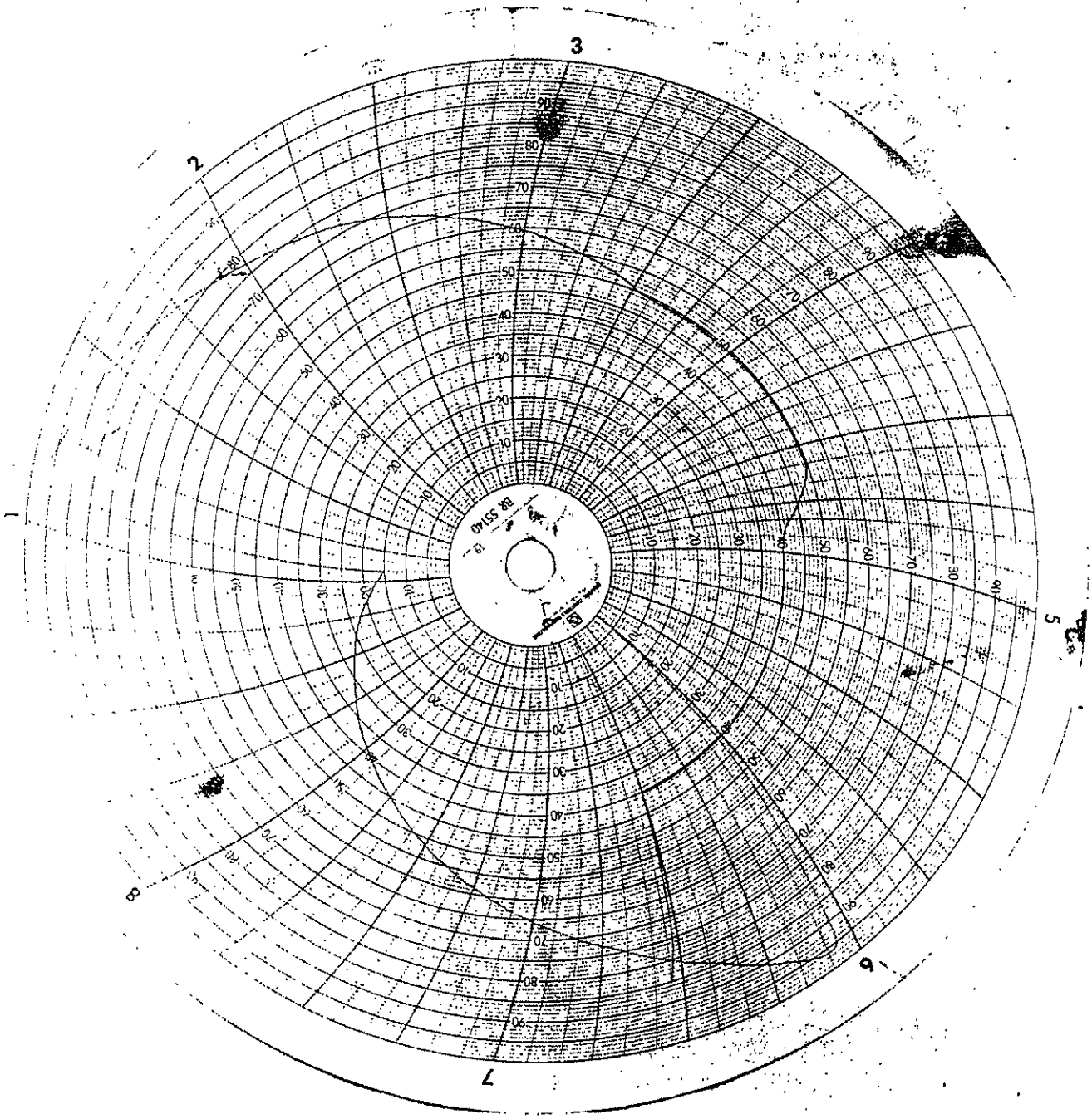
Test Pressure Formula

____ (H) × ____ (J) − (____ (I) × .036) = ____ NET TEST PRESSURE

Send Report to:
Client Corda
Address 1801 Falmouth
City, State New Hyde Park
Phone ( )
Attn:

CERTIFICATION This is to certify that this tank system was tested on date shown. Those indicated "Tight" meet the criteria established by the National Fire Protection Association Pamphlet 329

Tank No.
Tight Yes
Leakage Indicated -.0
Technician BFAR...
Date Tested - - -92


1
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Seaboard Estates, Inc.

ONE JERICHO TURNPIKE
NEW HYDE PARK, N.Y. 11040

(516) 354-4300

well waiver granted 10/22/92 Abandonment must be done within 90 days. RR

ZOE Chemical Co Inc

September 2, 1992

Thomas R. Norris
Bureau of Land Resources Management
Nassau County Department of Health
240 Old Country Road
Mineola, New York 11501-4250

Re: Facility ID 1006

Dear Mr. Norris:

Seaboard Estates, Inc. hereby requests that you allow us to abandon a 2000 gallon oil tank located at 1801 Falmouth Avenue, New Hyde Park.

The tank we propose to abandon is located next to the foundation. To remove this tankcould cause severe structural damage to the building. In lieu of a monitoring well, we would like to do a tightness test.

Thank you for your consideration. Please let us know if we can answer any questions for you.

Very truly yours,

SEABOARD ESTATES, INC.

Laurence P. Gordon, V.P.

LPG:EB

Seaboard Estates, Inc.

ONE JERICHO TURNPIKE
NEW HYDE PARK, L.I., N.Y. 11040

516 FLoral Park 4-4300
212 Fieldstone 7-2525

October 8,1992

Mr. Oeckler
Bureau of Land Resources Management
Nassau County Department of Health
240 Old Country Road
Mineola, New York 11501-4250

Re: Facility ID 1006

Dear Mr.Oeckler:

Seaboard Estates,Inc. hereby requests that you allow us to abandon a 3000 gallon oil tank located at 1801 Falmouth Avenue,New Hyde Park.

The tank we propose to abandon is located next to the foundation. To remove this tank could cause severe structural damage to the building. A tightness test was performed on 9/29/92 by A.N.S. and passed. You should be receiving the results shortly.

Thank you for your consideration. Please let us know if we can answer any questions for you.

Very truly yours,

SEABOARD ESTATES,INC.

Laurence P. Gordon,V.P.

LPG:EB

Neil Axelrod Asst U.P.

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent: Zoë Chemical Co. Inc.
Address: 1801 Falmouth Avenue N.H.P. NY. 11040

Inspector

DATE	COMMENTS
4 October 1982	Visited Zoë Chemical towned Facility with Neil Axelrod - Asst. U.P.
	They have (2) 500 Gal. above ground STORAGE tanks for 1,1,1 Trichloroethane and also other above ground tanks for other organics (storage).
	Plant was last surveyed in Feb. 1980.
	According to Mr. Axelrod Asst. U.P. he will submit an updated chemical inventory list in annual dump to the writer.
	Mr. Axelrod will also supply additional information showing building permit connections and variances that cesspools submitted in 1978 investigation conducted by Messrs. Schachter & Margolin, have been cleaned & filled.
	Zoë Chemical have two other Ancillary bldgs. to their complex @ 1811 Gilford Avenue. NHP 1835 Gilford Avenue NHP. Did not have time to town these facilities at this time -.

EH 109a 1/68
DH-1198, 9/71

INVESTIGATION SUMMARY

Bureau of Water Pollution Control

Nassau County Dept. of Health

Date Opened

Received by
- [x] Phone
- [ ] Mail
- [ ] Walk-In
- [ ] Survey

Reason for Investigation
- [x] Complaint
- [ ] Survey
- [ ] Permit
- [ ] Other

Reinsp. Dates
1.
2.
3.

Location of Complaint
Address
City or Town
Census Tract

Notified of Confidentiality [ ] Yes [ ] No

Investigation [ ] Prev.Closed [ ] New [ ] In Proc.

Date Closed

COMPLAINANT

Name: C. Gunlan

Address: Bureau of Air Resources

City or Town: Steve Kramer Suffolk County D.E.C. 234-2622

Tel.

Apt.#

Name (owner): ZOE Chemical

Address: 1801 Falmouth Ave

City or Town: New Hyde Park

Tel.

Apt.#

NATURE OF COMPLAINT

- [ ] Oil Spill
- [ ] Discoloration
- [ ] Odor
- [ ] Jelly Fish
- [x] Industrial Waste
- [ ] Dead Fish, Birds, Ducks
- [ ] Garbage
- [ ] Sewage
- [ ] Scum
- [ ] Other (specify)

Specify (Where Necessary)

DON BATTISTA
Plant Mgr.

INSPECTION REPORT

Violation [ ] Yes [ ] No

Violation Notice Issued? [ ] Yes [ ] No
Date

Violation
- [ ] N.C.Pub.Health Law
- [ ] N.Y.S.Sanitary Code
- [ ] N.Y.S.DEC. Law

Dye Test Performed? [ ] Yes [ ] No

Results [ ] Pos. [ ] Neg.

Sample Taken [ ] Yes [ ] No

Total

Lab.#

Date Viol.Corrected:

Total Complaints Resolved:

Case Solution:
- [ ] Oper.Discont.
- [ ] New System
- [ ] System Repaired
- [ ] No Action

Referred to:

Date

Date	COMMENTS AND ACTION TAKEN	Sign.
07/24/78	Zoe Chemical has a industrial waste discharge into a cesspool[?]. This cesspool shows evidence of having overflowed at some time. Their sanitary waste is connected to the sewer. I spoke to MARVIN about this and he suggests that you notify Zoe that he must connect to the sewer even if pre-treatment is required. The nature of his industrial discharge is unknown. T. FOCAZIO	

Complainant Notified by: [ ] Letter [x] Phone [ ] Visit

Approved by:

Date

EH 613 6/76

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent : ZOE CHEMICAL Co.
Address: 1801 FALMOUTH AVE. N. Hyde Park

Inspector

DATE	COMMENTS
7/27/78	On 7/27/78 M. MANGINO + J. Schechter, of This office met with Don BATTISTA, plant foreman of Zoe Chemical Co. The inspection of The company revealed industrial wastes being discharged to cesspools located along Falmouth Ave. These wastes include products used in The manufacture of aerosol spray cans - furniture polish, starch, CHRISTMAS ~~etc~~. SNOW etc. (Mr. Battista stated an insecticide was also packaged at The plant, but is no longer being done.)
	The discharge of wastes occurs each time a new product is to be packaged in aerosol cans. At That Time, The stainless steel vats are washed out To clean Them of The previous runs residue.
	Mr. Battista was told That The plant was in violation in That The discharge represented a contravention of groundwater standards. He was told That he would have to connect to The sewer.
	Mr. Battista stated That The company had previously been connected To The public sewerage system However, plant waste had fouled The pumping stations contacts. DPW had requested The plant To discontinue discharges That caused The problem.
	Mr. Battista was told To have The owner,

EH 109a 1/68
DH-1198. 9/71

ENVIRONMENTAL
HEALTH
Continuation Sheet
Nassau County Health Department

Owner or
Agent :

Address:

Inspector

DATE	COMMENTS
	N. Axerod, contact this office concerning the violation of groundwater standards & the necessity of ~~discontinuing~~ discontinuing the effluent discharge to the cesspools.
	Joseph Hilts

EH 109a 1/68
DH-1198, 9/71

DUPLICATE ORIGINAL

This is Your Permit

Town of North Hempstead

BUILDING DEPARTMENT
CORNELIUS O'CONNOR
Manager
MANHASSET, N. Y.

File No..... Permit Fee..... Permit No..... Date.....

Application for Building Permit to Erect Commercial Building Town of North Hempstead, Manhasset, New York

INSTRUCTIONS

A. This application is to be made out in triplicate, in ink, or typewritten, and submitted with two complete sets of plans drawn to a uniform scale, including plumbing elevations, record for Department of Assessments, and fees. A separate plot plan in duplicate, drawn to a scale of not less than 20 feet to the inch, shall either be included in the building plans or submitted on a separate plot diagram furnished by the Building Department. Such plot plan shall show block and lot numbers, existing and proposed buildings with distances of same from the lot and street lines, location of cesspool or septic tank, names of all streets and distances from plot to nearest intersecting streets.

B. No application will be accepted unless complete with all questions answered or noted.

C. No application will be approved unless accompanying plans bear the approval of the State Department of Labor and the Building Official has received official notice of such approval.

D. When the application is approved it becomes a permit and must be kept on the premises with approved set of plans until completion of the work authorized therein.

E. No building shall be occupied or used in whole or in part for any purpose until a Certificate of Occupancy shall have been applied for in writing and issued by the Building Official, certifying that such building conforms substantially to the approved plans and specifications and the requirements of all Ordinances and Laws applying to buildings of its class and kind. Such application shall be accompanied by a certificate from the Nassau County Department of Health covering sewage disposal.

APPLICATION IS HEREBY MADE to the Building Official of the Town of North Hempstead for the approval of the detailed statement and plans herewith submitted for the construction of the building or buildings herein described.

PERMITS EXPIRE WITHIN SIX MONTHS FROM DATE OF ISSUANCE UNLESS CONSTRUCTION IS IN PROGRESS

NO WORK TO BE STARTED UNTIL PERMIT HAS BEEN RECEIVED

GENERAL

Owner Hansal Properties, Inc. Address 1 Jericho Turnpike, New Hyde Pk.
If owner is a corporation, give name and title of responsible Officer Carl Gordon Title President
Architect Otto J. & Warren A. Sambach Address 216-22 Queens Village, 28, N.Y.
Contractor..... Address.....

Workmen's Compensation Insurance

Pursuant to Section 57 of the Workmen's Compensation Insurance Law a Certificate of Insurance is filed with this application or will be furnished by..... covering all operations in connection therewith, as follows, and no permit will be given until same is received.
Insurance Co. ..... Policy No..... Exp. Date.....

Location: County Tax Map Section 8 Block No. 189 Lot Nos. 1 to 12, 42 to
southeast side of Evergreen Ave & Gould Street Street ..... ft.
of corner
(Nearest Intersecting Street) New Hyde Park (Post Office)

ZONING

Zoning District Industrial B Prevailing setback in block 10' ft.
Total percentage of lot to be occupied 78%. Percentage at present occupied by existing buildings none %.
Size of Plot 340' ft. front 200' ft. deep. Total sq. ft. 88,000.
Do you own any adjoining property? 200' 100'
Are there any existing buildings or structures on this plot? no
If so, state use.....
State use of proposed building Distribution center. Loading and unloading of trucks.
Does this property adjoin a residence district or Parkway property? no which?
Will any part thereof be used for dwelling purposes? no
Compute commercial floor area in square feet.....
Type of construction: ordinary..... semi-fireproof..... x fireproof.....
Dimensions of building 330' ft. front 180' ft. deep. Total sq. ft. 59,400
Height 20' ft., stories one & part two Total cubic ft. 1,188,000
Estimated cost or value of this construction $ 300,000.00
Is there a municipal sewer available? no If so, do you propose to connect to same?.....
If no sewer, state size of cesspool or septic tank three cesspools, 8' dia.
Cesspool cover will be not more than two feet below finished grade.
Unless connected with municipal sewerage system, a plan approved by the Nassau County Department of Health showing sewerage disposal facilities must be filed with this application.

Distances from Proposed Buildings to Property Lines

	Front Yard	Side Yard	Side Yard	Rear Yard
Main building	10 ft.	10 ft.	10 ft.	10 ft.
Accessory building	10 ft.	10 ft.	100 ft.	10 ft.

Submit detail as to parking and loading and unloading areas.

SPECIFICATIONS

Footings: Material poured conc Mix 1:3:4 Size under columns: Width 4'0" Depth 2'0" dependi
Size under walls: Width 36" Depth 4'0" on soil

Foundation Walls. Material poured concrete Mix 1:3:4 Thickness 16" Depth 3'0" " "
below grade

Walls: conc block, poured conc

1st story — Material brick, Thickness 12"

2nd story — Material brk, blk Thickness 12"

3rd story — Material ..... Thickness .....

4th story — Material ..... Thickness .....

Floors — Material poured concrete

The following shall be No. 1 grade:

Joists:

1st floor — ..... x ..... Material ..... o.c. .....

2nd floor — ..... x ..... Material ..... o.c. .....

3rd floor — ..... x ..... Material ..... o.c. .....

4th floor — ..... x ..... Material ..... o.c. .....

Ceiling ..... x ..... Material ..... o.c. .....

Rafters ..... x ..... Material ..... o.c. .....

If floors are to be supported by columns and girders, give following:

Girders: structural steel

1st floor — ..... x ..... Span ..... Material ..... Grade .....

2nd floor — ..... x ..... Span ..... Material ..... Grade .....

3rd floor — ..... x ..... Span ..... Material ..... Grade .....

4th floor — ..... x ..... Span ..... Material ..... Grade .....

Columns:

1st floor — ..... x ..... Material ..... Grade .....

2nd floor — ..... x ..... Material ..... Grade .....

3rd floor — ..... x ..... Material ..... Grade .....

4th floor — ..... x ..... Material ..... Grade .....

This building will safely sustain per superficial foot upon 1st floor on grade lbs.; 2nd floor 175 lbs.;

3rd floor ..... lbs.; 4th floor ..... lbs.

Minimum height of ceilings: Cellar ..... ft.; 1st floor 20' ft.; 2nd floor 9' ft.; 3rd floor ..... ft.;

4th floor ..... ft.

Roof sheathing material ..... Thickness .....

Roof covering material 5 ply tar and slag, poured concrete for roof parking

If building is to be of fireproof or semi-fireproof construction, show detailed floor and roof construction on plans.

Heating equipment: Type unit htrs Fuel oil Furnace flue-size ..... Furnace flue lined with .....

I will see to it that the proposed work is faithfully carried out as described in this application and as shown on the plans accompanying same, and not otherwise. Provisions of laws and ordinances applying to the premises and the proposed work will be complied with whether stated in application and plans or not, and the buildings and structures affected by the application will not be used for any other purposes than stated.

STATE OF NEW YORK }
COUNTY OF NASSAU } ss.:

CARL GORDON being duly sworn, deposes and says: that he is the person who signed the foregoing application for a permit*; that he is authorized by the principal to make said application*; that the statements set forth therein are true; that the proposed work stated in said application is authorized by the owner in fee; that if any changes are made during construction he will file amended plans before making such changes.

Sworn to before me this

1st day of November, 1955

Paul E. Fusco

PAUL E. FUSCO
Notary Public, State of New York
No. 30-6468900
Qualified in Nassau County
Term Expires March 30, 1956

Applicant Carl Gordon

Address 1 Jericho Turnpike,
New Hyde Park, N. Y.

ARTICLE I. Section 2, of the Building Code

"Permits and Inspections."—No wall, structure, building or part thereof, shall hereafter be built, enlarged or altered until a plan of the proposed work, together with a statement of the materials to be used, shall have been submitted in duplicate to the Building Official, who shall, if in accordance with the provisions herein contained, issue a permit for the proposed construction.

ARTICLE I. Section 28, of the Building Code

All lumber and timber used as structural members of any structure shall bear the official grade-mark and trade-mark of the Association under whose grade rules it was manufactured.

* Strike out inapplicable words.

Do not write in this space.

2500-9/53-WP

ORIGINAL

Town of North Hempstead

BUILDING DEPARTMENT
CORNELIUS O'CONNOR
Manager
MANHASSET, N. Y.

File No. 61-4570 Permit Fee 7.00 Date 10/9/61 Permit No. 36807

Building No. ..... Job. No. .....

APPLICATION FOR PLUMBING PERMIT

To be used for installation of plumbing in newly constructed buildings.

INSTRUCTIONS

This application shall be in ink or typewritten and filed in triplicate. Unless previously filed with building application plans of plumbing, floor and vertical, shall be submitted in duplicate, one set to be filed with the Department and duplicate set bearing approval of the Building Official to be kept on the work and exhibited on demand to the Building Official of the Town of North Hempstead or his authorized agent. **No application for plumbing permit will be accepted unless such plans have been filed.** All vertical lines of soil, waste, leader and refrigerator pipes shall be designated by numbers or letters. A soil or waste line and its attendant vent line may be considered as one stack and so numbered or lettered. All work must conform to the Building Code.

WHEN THIS APPLICATION IS APPROVED IT BECOMES A PERMIT AND MUST BE KEPT ON THE PREMISES UNTIL COMPLETION OF THE WORK AUTHORIZED HEREIN.

APPLICATION IS HEREBY MADE to the Building Official of the Town of North Hempstead for approval of the detailed statement and plans herewith submitted for the installation of plumbing and drainage as herein described.

Owner Gordon & Son Address Jericho Tpke, New Hyde Pk

Location (Nassau County Tax Map):

Sec. No. 8 Block No. 189 Lot No. 10 12 - 42 & 73

N/E side of Falmouth Street feet

of Gould St. (Nearest Intersection) New Hyde Park (Post Office)

How will building be occupied? Commercial

SPECIFICATIONS

How will sewage and drainage be disposed of? Sewer, septic tank, cesspool? Cesspool

If septic tank or cesspool give size 8 x 14

	x	x	Location					
House Sewers—Number	1	Material	C.I.	Diameter	5"	Fall per foot	1/4	
House Traps—Number	1	Material	"	Diameter	4"			inches.
Fresh-air Inlets—Number	1	Material	"	Diameter	4"	Location	Side	
House Drains—Number	1	Material	"	Diameter	4"	Fall per foot	1/4"	
Soil Lines—Number	1	Material	"	Diameter	4"			
Waste Lines—Number	1	Material	"	Diameter	4"			
Vent Lines—Number	2	Material	galv	Diameter	1 1/2" & 2"			
Refrigerator Waste Lines—Number		Material		Diameter				

How will drainage be provided for courtyard and roof drains? (not less than 10 feet from building).

Will grease trap be installed? No Size .....

Location of grease trap .....

How will the floor of water-closet compartment be made waterproof? floor Slab

Size of Water Meter 1 1/2" Size of Water Service 1 1/2"

Kind of pipe for Water Service Copper

61-4570

NO WORK IS TO BE STARTED UNTIL PERMIT HAS BEEN RECEIVED

FIXTURES

To Include Roughing for Future Fixtures

Indicate Number of Proposed Trapped Fixtures on all Floors	Cellar	Basement	1st Floor	Second	Third	Fourth	Describe Fixtures	Total Fixtures	
Water-Closets			6						
Urinals			2						
Wash-basins			5						
Bath-tubs									
Wash-tubs									
Sinks			1						
Stall Showers									

Total Fixtures 14 Fee $

STATE OF NEW YORK } ss.:
COUNTY OF NASSAU }

Edward Zulkofske

being duly sworn, deposes and says that he is a duly licensed Master or Employing Plumber in the Town of North Hempstead, with shop at 100 Sunrise Hgts New Hyde Park that he has been duly authorized by the owner in fee mentioned herein to do the Plumbing and Drainage work set forth in the foregoing application and shown on accompanying plans, and he further agrees that in the performance of said work he will comply with all provisions of the Building Code and all other Rules and Regulations of the Building Department, whether herein specified or not, and if any change is made in the installation of plumbing and drainage covered by this application, he will forthwith file amended plans in accordance therewith.

Sworn to this 9 day of October 1961

A. Jeannette Schlamp

A. JEANNETTE SCHLAMP
NOTARY PUBLIC, State of New York
No. 30-3501325
Qualified in Nassau County
Term Expires March 30, 1963

Edward Zulkofske
Plumber

License No. 27

Show location of cesspool or septic tank with relation to building

N

Inspections	Date	Violations	Date	Date Cor.
Cesspool	10-27-61			
Rough Plumbing	10-27-61			
Water Test	11-4-62			
Flange	11-4-62			
Final	11-4-62			

Work commenced ..... Date signed off 12/5/62

I hereby certify that the above report is true in every respect and that the work indicated has been done in the manner required, except where reported adversely.

Fred Brush
Inspector

Do not write in this space.

EXAMINED AND RECOMMENDED FOR APPROVAL OCT 9 1961
FRED BRUSH F.B. INSPECTOR

APPROVED
John J. McDonald
Manager Building Department
OCT 9 1961

ORIGINAL

Town of North Hempstead

CLINTON G. MARTIN, Supervisor
BUILDING DEPARTMENT
JOHN F. McDONALD, Manager
Manhasset, N. Y.

File No. 63-2652 Permit Fee 5.00 Date 6/13/63 Permit No. 47464

Bldg. Permit No. _____ Job No. _____

APPLICATION FOR PLUMBING ALTERATION PERMIT

NOTICE—This form is to be used for all alterations or additions to existing plumbing systems. This application must be made in ink or typewritten and filed in triplicate. Duplicate — Original when approved becomes your plumbing permit and must be kept on the location and exhibited on demand to the Building Official or his agent. Plans of plumbing, floor and vertical, must accompany application, and sketches may be made on the unruled space on the opposite side of this sheet. **No application for plumbing permit will be accepted unless accompanied by such plans.** In Alterations where new fixtures lines or long branches are to be connected to present lines, the location and diameter of said lines must be shown on the plans and specified. All alterations and new work must conform to Article II of the Building Code.

APPLICATION IS HEREBY MADE to the Building Official of the Town of North Hempstead for approval of the detailed statement and plans herewith submitted for the installation of plumbing and drainage as herein described.

Owner Seaboard Estates Inc. Address 1801 FALMOUTH AVE

Location: County Tax Map Section 8 Block No. 189 Lot Nos. 1-12 42-73

NORTH side of FALMOUTH & GOULD Street _____ ft. _____

of _____ NEW HYDE PARK
(Nearest Intersection) (Post Office)

Present use of building FACTORY

If dwelling, number of families _____

How will building be occupied following these alterations _____

State briefly the work to be done SEWER CONN.

AW 00157

How will sewage and drainage be disposed of? Sewer, septic tank, cesspool? _____

_____ If septic tank or cesspool give size _____ x _____

_____ x _____ x _____ Location _____

TO INCLUDE FIXTURES RESET WHERE NEW ROUGHING IS INSTALLED

INDICATE NUMBER OF TRAPPED FIXTURES	WATER CLOSET	URINALS	WASH BASINS	BATH TUBS	WASH TUBS	SINKS	DENTAL CUSPIDORS	SLOP SINKS	DRINKING FOUNTAINS	STALL SHOWERS	Describe Fixtures
Cellar											
First											
Second											
Third											

Total fixtures _____ Fee $ _____

(Over)

NO WORK IS TO BE STARTED UNTIL PERMIT HAS BEEN RECEIVED

63-2652

PLUMBING SKETCH

STATE OF NEW YORK }
COUNTY OF NASSAU } ss.:

being duly sworn, deposes and says that he is a duly licensed Master or Employing Plumber in the Town of North Hempstead, with shop at ____________ and that he has been duly authorized by the owner in fee mentioned herein to do the Plumbing and Drainage work set forth in the foregoing application and shown on accompanying plans, and he further agrees that in the performance of said work he will comply with all provisions of the Building Code and all other Rules and Regulations of the Building Department, whether herein specified or not, and if any change is made in the installation of plumbing and drainage covered by this application, he will forthwith file amended plans in accordance therewith.

Sworn to this 11 day of June 1963

A. Jeannette Schlamp

A. JEANNETTE SCHLAMP
NOTARY PUBLIC, State of New York
No. 30-3501325
Qualified in Nassau County
Term Expires March 30, 1965

Joel Sgarpuccis(?)
Plumber

License No. 545

N

Show location of cesspool or septic tank with relation to building

Inspection	Date	Violations	Date	Date Co
Cesspool				
Rough Plumbing				
Water Test				
Flange				
Final				

Work commenced ____________ Date signed off June 15,

I hereby certify that the above report is true in every respect and the work indicated has been done in the manner required, except w... reported adversely.

Fred Brush
Inspector

Do not write in this space.

EXAMINED AND RECOMMENDED FOR
APPROVAL JUN 12 1963
FRED BRUSH INSPECTOR

APPROVED
John F. McDonal...
Manager Building Depart...
JUN 13 1963

ORIGINAL

7B

Town of North Hempstead

BUILDING DEPARTMENT
CORNELIUS O'CONNOR
MANAGER
MANHASSET, N. Y.

File No. 61-226 Permit Fee. 130.00 Date 1/26/61 Permit No. 43833

Application for Building Permit to Erect Commercial Building Town of North Hempstead, Manhasset, New York

INSTRUCTIONS

A. This application is to be made out in triplicate, in ink, or typewritten, and submitted with two complete sets of plans drawn to a uniform scale, including plumbing elevations, record for Department of Assessments, and fees. A separate plot plan in duplicate, drawn to a scale of not less than 20 feet to the inch, shall either be included in the building plans or submitted on a separate plot diagram furnished by the Building Department. Such plot plan shall show block and lot numbers, existing and proposed buildings with distances of same from the lot and street lines, location of cesspool or septic tank, names of all streets and distances from plot to nearest intersecting streets.

B. No application will be accepted unless complete with all questions answered or noted.

C. No application will be approved unless accompanying plans bear the approval of the State Department of Labor and the Building Official has received official notice of such approval.

D. When the application is approved it becomes a permit and must be kept on the premises with approved set of plans until completion of the work authorized therein.

E. No building shall be occupied or used in whole or in part for any purpose until a Certificate of Occupancy shall have been applied for in writing and issued by the Building Official, certifying that such building conforms substantially to the approved plans and specifications and the requirements of all Ordinances and Laws applying to buildings of its class and kind. A plan in duplicate, containing the certification of an engineer licensed by the State of New York, will be required before a permit is issued for any private sewage disposal facilities for all buildings other than dwellings, as to its physical operation.

APPLICATION IS HEREBY MADE to the Building Official of the Town of North Hempstead for the approval of the detailed statement and plans herewith submitted for the construction of the building or buildings herein described.

PERMITS EXPIRE WITHIN 6 MONTHS FROM DATE OF ISSUANCE UNLESS CONSTRUCTION IS IN PROGRESS

NO WORK TO BE STARTED UNTIL PERMIT HAS BEEN RECEIVED

GENERAL

Owner Gordon & Son Realty Co., Inc. Address 1 Jericho Turnpike, New Hyde Park

If owner is a corporation, give name and title of responsible Officer Carl Gordon Title President

Engineer ~~Architect~~ Otto J. & Warren A. Sambach Address 374 Hillside Ave., Williston Park

Contractor Gordon & Son Realty Co., Inc. Address 1 Jericho Turnpike, New Hyde Park

Workmen's Compensation Insurance

Pursuant to Section 57 of the Workmen's Compensation Insurance Law a Certificate of Insurance is filed with this application or will be furnished by ..... covering all operations in connection therewith, as follows, and no permit will be given until same is received.

Insurance Co. ..... Policy No. ..... Exp. Date .....

Location: County Tax Map Section 8 **Block No.** 189 **Lot Nos.** 1 to 12, 42 to 73

Northeast Corner of Falmouth Avenue side of ..... **Street** ..... ft. .....

of and Gould Street (Nearest Intersecting Street) New Hyde Park (Post Office)

ZONING

Zoning District Industrial B Prevailing setback in block ..... ft.

Total percentage of lot to be occupied 58 %. Percentage at present occupied by existing buildings ..... %.

Size of Plot 540' ft. front 200' ft. deep. Total sq. ft. 88,000

Do you own any adjoining property? No

Are there any existing buildings or structures on this plot? No

If so, state use .....

State use of proposed building manufacture

Does this property adjoin a residence district or Parkway property? No which? .....

Will any part thereof be used for dwelling purposes? No

Compute commercial floor area in square feet .....

Type of construction: ordinary ..... semi-fireproof X fireproof .....

Dimensions of building ~~200~~ 280 ft. front ~~170~~ 160' ft. deep. Total sq. ft. ~~34,000~~ 44,800

Height 16 ft. Stories one Total cubic ft. ~~816,000~~ 720,000

Estimated cost or value of this construction $ 125,000

Is there a municipal sewer available? Yes If so, do you propose to connect to same? Yes

If no sewer, state size of cesspool or septic tank .....

Cesspool cover will be not more than ..... feet below finished grade.

Unless connected with municipal sewerage system, a plan approved by the Nassau County Department of Health showing sewerage disposal facilities must be filed with this application.

Distances from Proposed Buildings to Property Lines

	Front Yard	Side Yard	Side Yard	Rear Yard
Main building	10 ft.	2 ft.	38 to 238 ft.	20 ft.
Accessory building	..... ft.	..... ft.	..... ft.	..... ft.

Submit detail as to parking and loading and unloading areas.

61 226

SPECIFICATIONS

Footings: Material Poured Conc on Piles Mix 1:2:4 Size under columns: Width ..... Size under walls: Width 16" Depth .....

Foundation Walls: Material Poured Concrete Mix 1:2:4 Thickness 16" Depth 2'6" below grade

Walls:

1st story—Material Masonry Thickness 8" & 12"

2nd story—Material ..... Thickness .....

3rd story—Material ..... Thickness .....

4th story—Material ..... Thickness .....

Floors— Material .....

The following shall be No. 1 grade:

Joists:

1st floor—.....x.....Material.....o.c.....

2nd floor—.....x.....Material.....o.c.....

3rd floor—.....x.....Material.....o.c.....

4th floor—.....x.....Material.....o.c.....

Ceiling .....x.....Material.....o.c.....

Rafters .....x.....Material.....o.c.....

If floors are to be supported by columns and girders, give following:

Girders:

1st floor—.....x.....Span.....Material.....Grade.....

2nd floor—.....x.....Span.....Material.....Grade.....

3rd floor—.....x.....Span.....Material.....Grade.....

4th floor—.....x.....Span.....Material.....Grade.....

Columns:

1st floor—.....x.....Material.....Grade.....

2nd floor—.....x.....Material.....Grade.....

3rd floor—.....x.....Material.....Grade.....

4th floor—.....x.....Material.....Grade.....

This building will safely sustain per superficial foot upon 1st floor.....lbs.; 2nd floor.....lbs.; 3rd floor.....lbs.; 4th floor.....lbs.

Minimum height of ceilings: Cellar.....ft.; 1st floor 14 ft.; 2nd floor..... ft.; 3rd floor.....ft.; 4th floor.....ft.

Roof sheathing material Poured gypsum Thickness 2"

Roof covering material 5 ply built up roof

If building is to be of fireproof or semi-fireproof construction, show detailed floor and roof construction on plans

Heating equipment: Type Oil burner #2 Fuel Oil Furnace flue-size 16" x 16" Furnace flue lined with T.C.

I will see to it that the proposed work is faithfully carried out as described in this application and as shown on the plans accompanying same, and not otherwise. Provisions of laws and ordinances applying to the premises and the proposed work will be complied with whether stated in application and plans or not, and the buildings and structures affected by the application will not be used for any other purposes than stated.

STATE OF NEW YORK } ss.:
COUNTY OF NASSAU }

Warren A. Sambach, being duly sworn, deposes and says: that he is the person who signed the foregoing application for a permit*; that he is authorized by the principal to make said application*; that the statements set forth therein are true; that the proposed work stated in said application is authorized by the owner in fee; that if any changes are made during construction he will file amended plans before making such changes.

Sworn to before me this 31 day of October, 1960

Frederick T. Francke
FREDERICK T. FRANCKE
Notary Public, State of New York
No. 30-6277700
Qualified in Nassau County
Commission Expires March 30, 1962

Applicant Warren A Sambach

Address 374 Hillside Avenue
Williston Park, N. Y.

Inspections	Date	Violations	Date	Date Cor.
Excavation	6-9-61	Capping Piles 5-15-61		
Footings	6-19-61			
Foundation Walls	6-26-61			
Framing	11-2-61			
Final	12/4/61			

Elec. Cert. No. ..... Date ..... Survey Date 12/4/61

Remarks .....

Work commenced ..... Date signed off .....

I hereby certify that the above report is true in every respect and that the work indicated has been done in the manner required, except where reported adversely.

* Strike out inapplicable words.

Fred Brush Inspector

Do not write in this space.

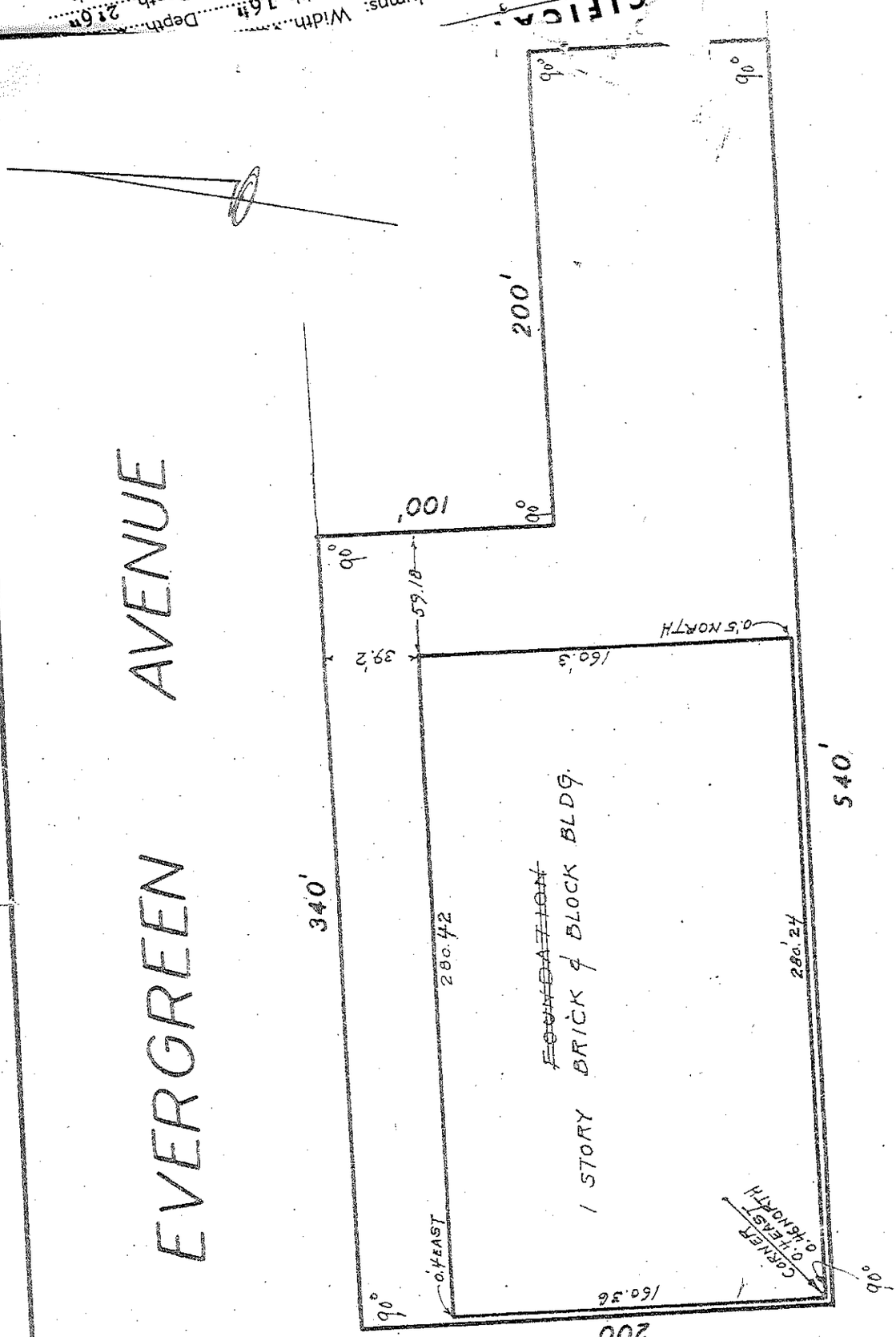
EXAMINED AND RECOMMENDED FOR APPROVAL JAN 17 1961

FRED BRUSH INSPECTOR

APPROVED

Manager Building Department

JAN 26 1961



SEC. 8
BLK. 189

Lot 1-12 INCL. & 42-73 INCL.
Block 4
Map of NEW HYDE PARK ESTATES
Location NEW HYDE PARK, NASSAU COUNTY, N.Y.
Guaranteed to HOME TITLE GUARANTY COMPANY
FRANKLIN NATIONAL BANK
Measurements according to N. Y. State Standard.
Date 6-29-61
7-5-62 FINAL
Scale 1" = 60'
Stakes noted thus ■
B. P.

ROBERT FRIEDE
LAND SURVEYOR
NEW HYDE PARK, N. Y.
SUCCESSOR TO
CHAS. H. WECKER
CIVIL ENGINEER & SURVEY
NEW HYDE PARK, N. Y.
R. Friedel

DEPARTMENT OF LABOR

DIVISION OF INDUSTRIAL SAFETY SERVICE
BUILDING PLANS ENGINEERING UNIT

GOV. ALFRED E. SMITH STATE OFFICE BUILDING
ALBANY 1, N. Y.

PLAN No. 60 3053 DEC 1560

RECEIVED DEPT. OF LABOR

PREVIOUS CORRESPONDENCE
Attached_____ None_____

APPLICATION FOR APPROVAL OF PLANS

FACTORY OR MERCANTILE BUILDINGS

SUBMIT APPLICATION IN TRIPLICATE

1. New Hyde Park (Municipality) N/E Corner Gould Street & Falmouth Ave. (Street and Number) Nassau (County)
2. Owner Seaboard Estates, Inc. Address 1 Jericho Turnpike, New Hyde Park New York
3. Lessee_____ Address_____
4. Engineer ~~or Architect~~ Otto J. & Warren A. Sambach Address 374 Hillside Ave., Williston Park New York

OCCUPANCY

5. Approval of plans is requested for use of building in accordance with the following statements:

FLOOR	MERCANTILE		MANUFACTURING		OTHER PURPOSES	PERSONS EMPLOYED OTHER THAN PROPRIETORS					
						AT PRESENT		ADD'L PROPOSED		TOTAL	
	SALES-DISPLAY	STORAGE	MFG.	STORAGE		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
BASEMENT											
GROUND			50	20		50	20			50	20
SECOND											
THIRD											
FOURTH											

6. Total number employed at office work* 2 6a. Total number employed at manufacturing** 50
7. Will any radiological devices or radioactive materials be operated, used, repaired or stored in this structure? No
8. Materials or articles manufactured Machine shop Merchandise sold None

PROPOSED CONSTRUCTION

9. New building X, Addition_____, Alteration_____, Estimated cost $150,000.00
10. Number of floors above ground None, Below None 11. Automatic sprinklers Yes, All areas Yes
12. Materials of walls Masonry, Windows, Floors Concrete, Roof Poured gypsum
13. Roofing 5-ply tar & slag, Floor framing_____, Roof framing Bar Joists, Str. Steel, Windows Steel
14. Access to adjoining building_____ What floors_____ By what means_____
15. Heating system: Type Warm air (steam, hot water, warm air) Distribution Space heater (radiator, duct, unit heater, space heater)

EXISTING PART OF BUILDING

16. When erected:

Prior to Oct. 1, 1913	Between Oct. 1, 1913 / July 1, 1924	Between July 1, 1924 / June 1, 1935	After June 1, 1935

17. Was the structure occupied as a factory on July 1, 1948_____ by whom_____
18. Most recent occupant_____ Type of business_____
19. No. of stories above ground_____, Below_____, Sprinkler system over all areas_____
20. Materials of walls_____, Floors_____, Roof_____, Roofing_____
21. Have any variations been granted relative to features of this structure?_____

*Office employees include stenographers, accountants, typists, engineers, surveyors, designers, draftsmen, bookkeepers, clerks, etc.
**Manufacturing includes making, altering, repairing, finishing, bottling, canning, cleaning, laundering, packing, sorting, crating, etc.

☞ Plans should be submitted in triplicate for each project accompanied by an application form filled out in triplicate.
☞ Describe proposed alterations in space provided therefor on reverse side of form.
☞ Furnish plot plan in space provided therefor on reverse side of form.
☞ When proposed construction exceeds $10,000 in cost or 30,000 cu. ft. in volume or involves structural alterations in existing buildings plans shall be prepared by and bear the seal of a Licensed Professional Engineer or Registered Architect entitled to practice in the State of New York.

ISS—600 (4—58)

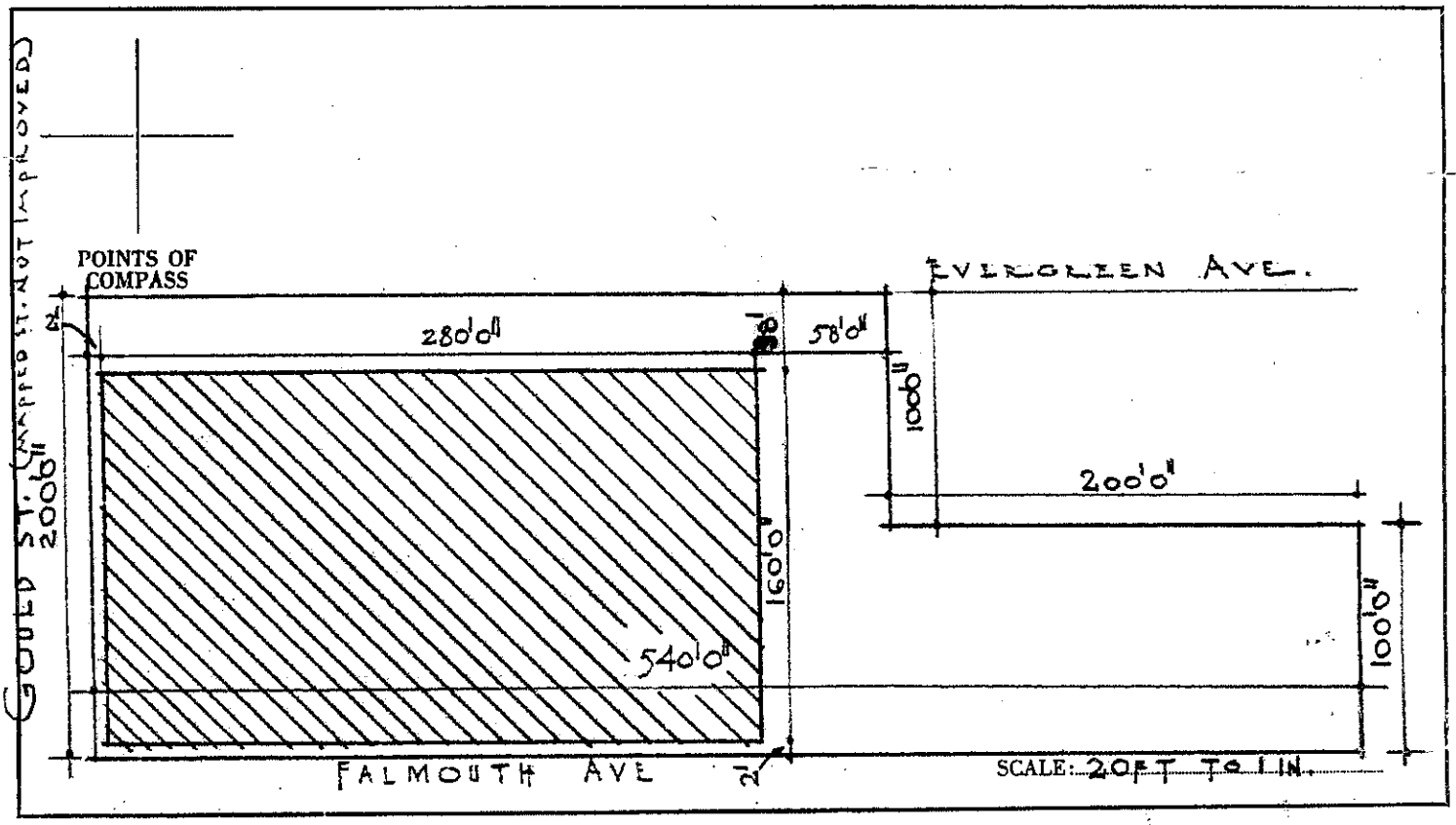
ALTERATIONS: Describe in detail all proposed alterations:

Warren A. Sambach

Applicant: Otto J. & Warren A. Sambach
Title: Consulting Engineers
Address: 374 Hillside Avenue
Williston Park, L.I., N. Y.

FAILURE TO PROVIDE COMPLETE INFORMATION MAY DELAY ACTION ON PLANS.

EVERGREEN AVE



IN SPACE ABOVE DRAW PLOT PLAN OF PROPOSED WORK AND ALL CONNECTED STRUCTURES

Designate each section by proper number and name; indicate height in stories of each section; give date of erection of each portion; plan must show entire outline of connected structures and approximate overall dimensions; show north point; give name of and show location of adjacent streets, railroads, canals, rivers, buildings, lot lines, etc.

LABOR LAW — DEFINITIONS

Sec. 2. — 11. "Mercantile establishment" means a place where one or more persons are employed in which goods, wares, or merchandise are offered for sale and includes a building, shed or structure, or any part thereof occupied in connection with such establishment. ----

Sec. 2. — 9. "Factory" includes a mill, workshop or other manufacturing establishment where one or more persons are employed at manufacturing, ---- and includes all buildings, sheds, structures or other places used for or in connection therewith, except (a) dry dock plants engaged in making repairs to ships, and (b) power houses, generating plants and other structures owned or operated by a public service corporation other than construction or repair shops, subject to the jurisdiction of the public service commission, ----

JOHN B. KIERNAN
SUPERVISOR

ROBERT S. BONNIE
COMMISSIONER

DEPARTMENT OF BUILDING,
SAFETY INSPECTION AND ENFORCEMENT
TOWN OF NORTH HEMPSTEAD, MANHASSET, N.Y.

Certificate of Approval

This certificate issued to. . .

Frank Falbo
11 Dennis Street
Garden City Park, N.Y. 11040

DATE May 26, 1988

CERTIFICATE No. 88-101

This Certifies that THE BUILDING LOCATED IN Sec. No. 8 Block No. 189 Lot No. 42-73

Nassau County Tax Map, Address 1801 Falmouth Ave. New Hyde Park, N.Y.

Location Northeast corner of Falmouth Ave. and Gould St.

conforms substantially to the approved plans on file in this office, Permit No. 59013 Date July 22, 1987 and to all requirements of the plumbing & drainage and/or heating codes of The Town of North Hempstead, Nassau County, N.Y.

Approval of sewer connection

Building Official

TOWN OF NORTH HEMPSTEAD BUILDING DEPT RW NASSAU COUNTY

TO BE STARTED UNT

Manufacturer ..... North Hempstead Certicate of Approval No. .....

Estimated cost of proposed buildings, alterations, etc 2,000.00

Sq. Ft. Area: 1st floor ..... 2nd floor ..... Garage ..... Porch .....

CERTIFICATE OF OCCUPANCY

This is Your Permit

File No. .....

C of A File No. .....

se Disposal

n and Enforcement Ordinance.

4-7-73 Date .....

DE PARK 11040

Other ☐

Repair ☐

SEWAGE .....

Type .....

127

35.0

...6... Blk. 189 Lot 42-73

...ing elevation must
...pool, cesspool or
...letely when filing.

This Is Your Permit

Permit File No. .....
C of C/C of A File No. .....
Fee .....
Inspector .....
Approved by .....
Date .....
Permit No. 59013
C of C No. .....
C of A No. .....

Town of North Hempstead

John B. Kiernan, Supervisor
DEPARTMENT OF BUILDING, SAFETY
INSPECTION AND ENFORCEMENT
Robert S. Bonnie, Commissioner
Manhasset, New York 11030

n/e/c
Falmouth Ave
9 Lovell St

APPLICATION FOR PERMIT

Plumbing, Heating, Drainage and Sewage Disposal

Issued pursuant to the provisions of the Building Zone Ordinance, and the Administration and Enforcement Ordinance.

Zone I-B Checked by JSA Section 5 Block 189 Lot 42-73 Date .....

Location 1801 FALMOUTH AVENUE, NEW HYDE PARK

Owner/Address NEIL AXELROD; ~~XXXX~~ 1801 FALMOUTH AVENUE, NEW HYDE PARK 11040

Residence ☐ Garage ☐ Business ☐ Industrial ☒ Other ☐

New Building ☐ Alteration ☐ Addition ☐ Repair ☐

INSTALLATION OF LOCKING VALVE AND SAMPLING PIT ON OUTSIDE OF BUILDING

PLUMBING ..... OIL BURNER ..... GAS BURNER ..... DRAINAGE ..... SEWAGE .....

Existing buildings used for CHEMICAL PLANT Proposed use SAME

Make of Burner ..... Model No. ..... Type .....

Manufacturer ..... North Hempstead Certicate of Approval No. .....

Estimated cost of proposed buildings, alterations, etc. 2,000.00

Sq. Ft. Area: 1st floor ..... 2nd floor ..... Garage ..... Porch .....

NO WORK IS TO BE STARTED UNTIL BUILDING PERMIT HAS BEEN RECEIVED BY APPLICANT

CERTIFICATE OF OCCUPANCY

1. **New building.** No building hereafter erected, enlarged, extended or altered shall be occupied or used, in whole or in part, until a certificate of occupancy, certifying that such building conforms to the approved plans and the requirements of this code and stating the purpose for which the building may be used in its several parts, and any special stipulations, shall have been issued by the Building Inspector and signed by him or his authorized assistant. If the occupancy or use of a building is not discontinued during the work of alteration, the occupancy or use of the building shall not continue for more than thirty days after the completion of the alteration unless a certificate shall have been issued.

2. **Change of occupancy.**

(a) No change or use shall be made in a building hereafter erected or altered that is not consistent with the last issued certificate of occupancy for such building unless a permit is secured. In case of an existing building, no change of occupancy that would bring it under some special provision of this ordinance shall be made unless the Building Inspector, upon inspection, finds out that such building conforms substantially to the provisions of this ordinance with respect to the proposed new occupancy and use, and issues a certificate of occupancy therefor.

(b) The reestablishment in a building, after a change of occupancy has been made, of a prior use that would not have been permitted in a new building of the same type of construction is prohibited. The change from a specifically prohibited use to another specifically prohibited use shall not be made.

TABLE OF FIXTU
To Include Roughing for Future

Indicate Number of Proposed Trapped Fixtures on all Floors	Cellar	Basement	1st Floor	Second	Third	Fourth	Describe Fixtures		
Water-Closets									
Urinals									
Wash-basins									
Bath-tubs									
Wash-tubs									
Sinks									
Stall Showers									

Inspections	Date	Violations	Date	Date Cor.
Cesspool/Sewer				
Rough Plumbing				
Water Test				
Flange				
Final				

Model No. .....

Serial No. .....

Fire Underwriters Label No. .....

Hot Water Hookup .....

Water Relief Valve .....

Location of Switch .....

Fuel Tank

Outside Tank: Feet from property line ..... Feet from building .....

Capacity ..... gals. Minimum gauge thickness ..... Depth under ground ..... ft.

Inside Tank: Distance from fire or source of flame ..... ft.

Capacity ..... gals. Minimum gauge thickness .....

NOTE: All underground tanks must be inspected before being covered.

1. *Workmen's Compensation Insurance and Disability Benefit Insurance has been secured in accordance with the requirements of the Workmen's Compensation Law as follows:

Insurance Co. THE STATE INSURANCE FUND Policy No. 472 001-7 Exp. Date 7/1/88 as per Certificate attached or on file with Building Department

Contractor .....

Address .....

.....

Print ..... (Signature of Licensed Plumber)

Print Applicant FRANK FALBO

Address 11 DENNIS STREET, GARDEN CITY PARK

Telephone 747-1311

Work Commenced ..... Date signed off 2/16/87

I hereby certify that the above report is true in every respect and that the work indicated has been done in the manner required, except where reported adversely.

RECOMMENDED FOR APPROVAL JUL 23 1987 JOHN CIANCIONE PLUMBING INSPECTOR

..... Inspector

Do not write in this space.

APPROVED JUL 23 1987 ROBERT S. BONNIE COMMISSIONER

COUNTY OF NASSAU, DEPARTMENT OF Division of Sanitation and Water Supply 1 West Street, Mineola, N.Y. 11501 SEWER CONNECTION PERMIT [80] This above numbered permit, attached to

SPECIAL REQUIRED PERMIT ISSUED TO SCAVENGING

PLUMBER FA FALBO, SAM JR. TELE 747-13

COUNTY OF NASSAU, DEPARTMENT OF PUBLIC WORKS
Division of Sanitation and Water Supply
1 West Street, Mineola, N. Y. 11501

EXPIRES 8/28/87

SEWER CONNECTION PERMIT

ADD 1% OF ESTIMATED CONSTRUCTION COSTS

This permit is issued to install a connection and discharge sewage into or disconnect from the Nassau County Sewer facility.

FEE	DATE	DISTRICT	PERMIT
20	6 29 87	2NHP4	S126

0

TOTAL PAID 20

LEGAL REQUIREMENT: Before dig, Call LILCO 661-6000 for tion of any underground util

ORIGINAL PERMITTEE

STREET ADDRESS	POST OFFICE	ZIP C
1801 FALMOUTH AV	NEW HYDE PARK	11

CODE	PERMITTEE	HOUSE CONNECTION STREET LOCATION	DISTANCE FEET	DIR	DEPTH FEET	IN	L.C.
B	☒ OWNER ☐ LESSEE	REQUIREMENTS ONLY	107	E	4	2	0

IMPORTANT: When ready for inspection, notify the proper County, Town or Village Department 24 hours in advance. Do not cover installation before inspection is made.

This Permit is issued subject to the provisions of the Nassau County Sewer Ordinance, the conditions printed on the reverse side hereof or attached hereto. Attachments on "S" series permits only.

☐ STF Only ☐ Additional Conditions Attached

Sydney L. Hall

COMMISSIONER OF PUBLIC WORKS

S-SCP-1 (10/82)

CODE B BUSINESS R RESIDENCE F 4 FAMILIES
M MULTIPLE DWELLINGS, 5 OR MORE FAMILIES

PAMELA CHARTERS
Notary Public, State of New York
No. 30-0620495
Qualified in Nassau County
Commission Expires March 30, 19 89

Pamela Charters

before me this 3rd

of, 19 87

PAMELA CHARTERS

COUNTY OF NASSAU, DEPARTMENT OF PUBLIC WORKS
Division of Sanitation and Water Supply
1 West Street, Mineola, N.Y. 11501

DATE	PERMIT NO.
6 29 87	S-126358

SEWER CONNECTION PERMIT ADDITIONAL CONDITIONS

1801 FALMOUTH AVE. NEW HYDE PARK (ADDITIONAL REQUIREM)

The above numbered permit, attached hereto, is subject to the following additional conditions:

ORIGINAL
PERMITTEE

SPECIAL PERMIT ISSUED FOR ADDITIONAL REQUIREMENTS FOR ZOE CHEMICAL CO.INC .REQUIRED TO "HOLD &HAUL" ALL PRODUCT TANK RINSE WASTEWATER THROUGH A LISENSED SCAVENGER.REQUIRED TO SEND A COPY(MONTHLY)OF THE LISENSED SCAVENGER MANIFEST REPORT TO THE INDUSTRIAL WASTE DIVISION OF THIS DEPARTMENT.THE FOLLOWING MAY CONTINUE DISCHARGE TO THE SANITARY SEWER: 1)SANITARY WASTEWATER2)CONTACT WATER FROM THE AEROSOL CAN LEAK CHECK BATH 3) FLOOR WASHINGS FROM THE STARCH ROOM.REQUIRED TO PUMP AND CLEAN MAIN EJECTOR PUMP PIT TO INSPECTORS SATISFACTION BY A LISENSED SCAVENGER. RE QUIRED TO INSTALL OUTSIDE LOCKING VALVE AND SAMPLING "T" ONDISCHARGE LINE.ROOF AND STORMWATER NOT ALLOWED TO DISCHARGE TO N.C.S.S.

SWS-1340 (10/75)

SWS-1 (10/82) CODE B BUSINESS R RESIDENCE F 4 FAMILIES
M MULTIPLE DWELLINGS 5 OR MORE FAMILIES

COMMISSIONER OF PUBLIC WORKS

PAMELA CHARTERS
Notary Public, State of New York
No. 30-0620495
Qualified in Nassau County
Commission Expires March 30, 1989

Pamela Charters

before me this 3rd
of, 19 87

PAMELA CHARTERS
Notary Public, State of New York
No. 30-0620495
Qualified in Nassau County
Commission Expires

OWNER'S AUTHORIZATION

STATE OF NEW YORK)
) SS.:
COUNTY OF NASSAU)

NEIL AXELROD being duly sworn,

deposes and says that he ~~resides at~~ RENTS

1801 FALMOUTH AVENUE, NEW HYDE PARK,

County of NASSAU, State of NEW YORK,

that he is (the ~~owner in fee~~)* (the TENANT,

of 1801 FALMOUTH AVENUE, NEW HYDE PARK,

the corporation which is the owner in fee) * of the premises at 1-12, 42-73

Section 8 Block ~~190~~ 189 Lot (s) 37~~41~~, ~~15-19~~,

that he has authorized ORCHID SEWER CONTRACTING CORP.

to make this application to the Building Department Town of North Hempstead

for INSTALLATION OF LOCKING VALVE AND SAMPLING PIT

and that the statements contained in the application are true.

Neil Axelrod
Owner's Signature

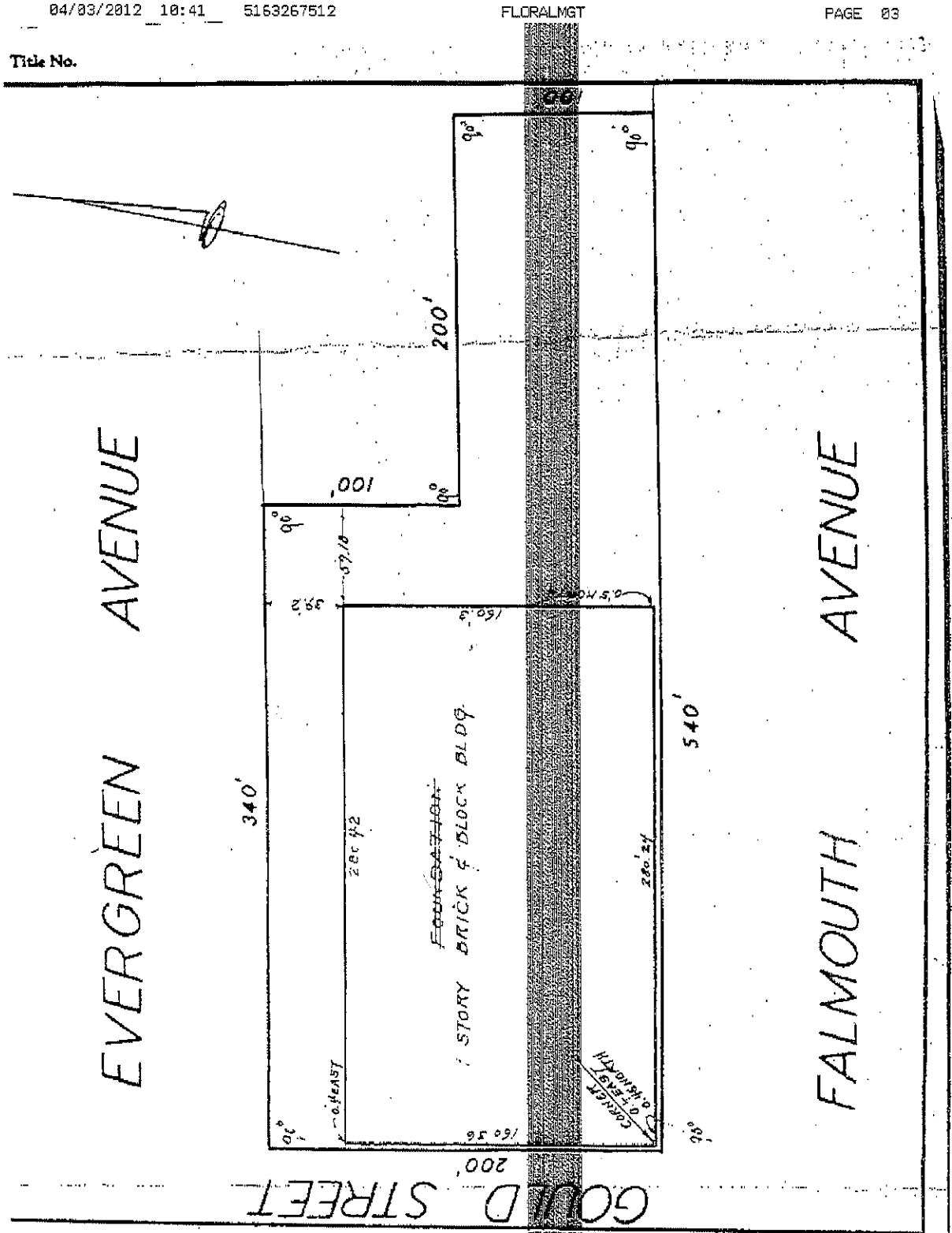
PAMELA CHARTERS
Notary Public, State of New York
No. 30-0620495
Qualified in Nassau County
Commission Expires March 30, 19 89

Pamela Charters

to before me this 3rd
of, 19 87

PAMELA CHARTERS
Notary Public, State of New York
No. 30-0620495
Qualified in Nassau County
Commission Expires March 30, 19__

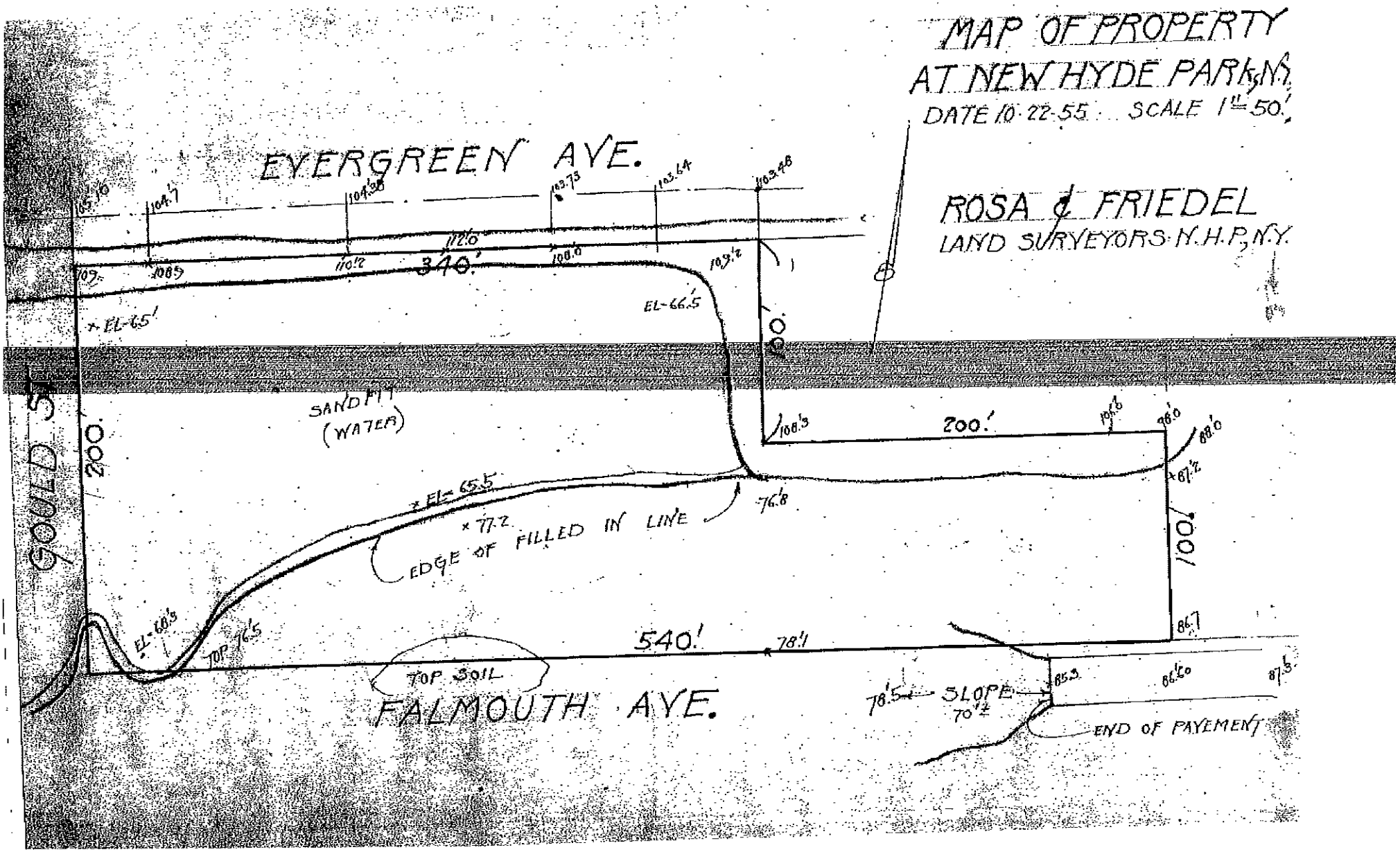
Title No.



Lot 1-12 INCL & 42-73 INCL.
Block 4
Map of NEW HYDE PARK ESTATES
Location NEW HYDE PARK, NASSAU COUNTY
Surveyed to HOME TITLE GUARANTY CO. N.Y.
FRANKLIN NATIONAL BANK
Measurements according to N. Y. State Standard.
Date 6-29-61 Scale 1"=60'
7-5-62 FINAL
Lakes noted thus

ROBERT FRIEDEL
LAND SURVEYOR
NEW HYDE PARK, N. Y.
SUCCESSOR TO
CHAS. H. WECKERLE
CIVIL ENGINEER & SURVEYOR
NEW HYDE PARK, N. Y.
R. Friedel

Sec. 8
Blk. 189
Lots 1-12 & 42-73



RECEIVED
MAR 5 1987
NCDH — BLRM

NASSAU COUNTY DEPARTMENT OF HEALTH — NASSAU COUNTY PUBLIC HEALTH ORDINANCE - ARTICLE XI
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 1 - GENERAL INFORMATION
SEE INSTRUCTION SHEET

For Office Use Only
Facility I.D. 1006
☐ Municipal
☒ Non-Municipal

Check all that apply to your facility: ☒ Tank Storage ☐ Container Storage ☐ Bulk Storage ☐ Storage of Road De-icing Materials

Reason for submitting application: ☒ New ☐ Renewal ☐ Change ☐ Construction

Facility Name	Street Address	Village	State	Zip	Phone
ZOE CHEMICAL CO.,INC.	1801 FALMOUTH AVENUE	NEW HYDE PARK	N.Y.	11040	354-1043
Facility Mailing Address (If different from above)		Facility Contact Person (Name & Title)			Phone
SAME		NEIL AXELROD,VICE PRESIDENT			354-1043
Facility Owner	Street Address	Village	State	Zip	Phone
SAME	SAME				
Property Owner (If not Facility Owner)	Street Address	Village	State	Zip	Phone
SEABOARD ESTATES INC.	1 JERICHO TURNPIKE	NEW HYDE PARK	N.Y.	11040	354 4300
Tank Owner (If not Facility Owner)	Street Address	Village	State	Zip	Phone

Name that should appear on Permit (Permittee)
(If different from Facility Owner)

Permittee's Street Address	Village	State	Zip	Phone

Permittee's Relationship to Facility Owner: ☒ Same ☐ Operator of Facility ☐ Other (Specify):

Principal Property Tax Code:	School District No.	Section	Block	Lot
	5	8	189	1

Forms Attached (Check all that apply) ☒ Form 2 - Tank Registration ☐ Form 3 - Bulk & Container Storage Registration ☐ Form 4 - Storage of Road De-icing Materials

I hereby affirm under penalty of perjury that the information provided on this form and on any attached forms, statements and exhibits is true to the best of my knowledge and belief.

Print Name	Signature	Title	Date
NEIL AXELROD	Neil Axelrod	VICE PRESIDENT	3/3/87

EH 857 4/86

INDUSTRIAL CHEMICAL SURVEY
BUREAU OF WATER POLLUTION CONTROL

Nassau County Department of Health
240 Old Country Road, Mineola, N.Y. 11501 Tel. 535-2404

Part I

Company Name: ZOE CHEMICAL		SIC (if known) Code:	
Company Mailing Address: 1811 GILFORD AVE. NEW HYDE PARK			Zip
Plant Name (if different):	Contact Name: NEIL AXELROD DONALD BATTISTA		Tel.: 354-1043
Plant Address:	Village:	Water Distr.:	Code / Zip
Principal Business of Plant: BOTTLING HOUSEHOLD PRODUCTS CLNRS ETC.		No. Employees at this Facility: 14 PART TIME	

Part II

COMPLETE LIST OF CHEMICALS USED (See attached)

PART III - DISCHARGE INFORMATION

WATER

1. Does your plant discharge liquid wastes to a municipally owned sanitary sewer system? If yes, name of system: Cesspool — ☐ Yes ☑ No

2. Is your facility permitted to discharge liquid wastes under a State (SPDES) or Federal (NPDES) permit? If yes, enter Permit No. — ☐ Yes ☑ No

3. Do you discharge liquid industrial wastes in any other manner? If yes, explain: TANK WASHINGS — ☑ Yes ☐ No

4. If any of the above are yes:
   a. Do you discharge process or chemical wastes, i.e., water used in manufacturing, including direct contact cooling water and scrubber water? — ☐ Yes ☑ No
   b. Do you discharge non-contact cooling water? — ☐ Yes ☑ No
   c. Do you discharge sanitary wastes? — ☑ Yes ☐ No

AIR

1. Does your facility have sources of possible emissions to the atmosphere? — ☐ Yes ☑ No

2. Enter location and facility code as shown on your Air Pollution Control Application for Permits & Certification (if applicable)

3. Heating System: ☐ None ☐ Boiler ☐ Space Heater (HOT AIR) | Type of Fuel: ☐ Electric ☐ Gas ☑ Oil | Incinerator: ☐ Yes ☑ No

SOLID & CONCENTRATED LIQUID WASTES

1. List name and address of firm (incl. yourself) removing wastes other than office and cafeteria refuse (industrial scavenger) EMPTY DRUMS

Name	Name
NONE	
Address	Address

2. List location(s) of landfills owned and used by your Facility

		Active	Inactive
a.	NONE		
b.			

PEST

Does this facility manufacture, produce, formulate or repackage pesticides? — ☐ Yes ☑ No

Signature (owner, partner, or officer): Neil Axelrod		Date: 4/9/87	
Name (printed or typed): NEIL AXELROD	Title: V. PRES.		
Inspector's Name: M. Juliuta		Date of Inspection: 4-9-87	

EH 651 4/77

The Nassau County Department of Health is conducting an investigation pursuant to New York State Environmental Conservation Law, 3-0301 (g) (h), 17-0303 (g), 19-0301 (d) and 37-0103, concerning the present practices of industry in Nassau County in relation to certain specific and broad classes of chemicals used in industrial processes.

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company: ZOE CHEMICAL | SIC Code | Water District | Code

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
DRY WELLS IN BUILDING						
LEAD TO CESSPOOL						
(5) MIXING TANKS 1000 gal						
(2) 4000 gal TANKS						
ALL TANKS HOLD AMMONIA,						
ALCOHOL WINDOW CLEANER					COMPONENTS	
ESI-CRYL 263		5,000	✓		FLOOR FINISH	
TRIBUTOXYETHYL PHOSPHATE		1500		✓	" "	
DOWANOL - DPM		1,000		✓		
DDBSA ALKYL BENZENE SULFONIC ACID		5,000		✓	COLD WATER WASH	
METHYL CARBITOL		1200		✓	FLOOR FINISH	
TRITON N101		1200		✓	" "	
ROHM + HAAS PHIL. PA. 592-3000						

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☐ No Action
9 ☐ Other (specify)

EH 651B 3/77

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company	SIC Code	Water District	Code
ZOE CHEMICAL			

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
PVP/VA E-735 COPOLYMER					NOT IN	
VINYLPYRROLIDONE/VINYL ACETATE					USE	
COPOLYMER IN ETHANOL						
RHOPLEX EXPERIMENTAL EMULSION					NOT IN USE	
UNITEX NEW LIQUID		900		✓	COLD WATER	
EMPIRE DYE STUFFS CORP					WASH	
206 SPRING ST.						
N.Y. NY 10012						
COLD WATER WASH BQT. #21421		100		✓	FRAGRANCE – COLD	
INTAROME					WATER WASH	
71 EAST PALISADE AVE						
ENGLEWOOD N.J. 07631						
AQUA AMMONIA		1800		✓	WINDOW CLNR.	
					FLOOR FINISH	
P/O-E 285		(2)				
TRIBUTOXYETHYL PHOSPHATE						

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☐ No Action
9 ☐ Other (specify)

EH 651B 3/77

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company	SIC Code	Water District	Code
ZOE CHEMICAL			

PART II - CHEMICALS USED (Include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
DIBUTYL PHTHALATE		1,000		✓	FLOOR FINISH	
DODECYL BENZENE SULFONIC ACID		DDBSA				
TRITON N-480		800		✓	" "	
CAUSTIC SODA 50%		1,000		✓	COLD WATER WASH	(WOOLITE TYPE PROD.
SYNTRAN 1535		3,000		✓	FLOOR FINISH	
SULFURIC ACID		50-		✓	PH ADJUSTMENT	
DEFOAMER-5-10		400		✓	DEFOAMING AGENT FLOOR FINISH	
VERSENE 100		1200		✓	" "	
TETRASODIUM SALT OF ETHYLENEDIAMINE TETRAACETIC ACID						
PROPYLENE GLYCOL		1200	✓		WINDOW CLNR	
ETHYLENE GLYCOL		600		✓	FLOOR FINISH	

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☐ No Action
9 ☐ Other (specify)

EH 651B 3/77

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company	SIC Code	Water District	Code
ZOE CHEMICAL			

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
NEOCRYL 5-1004 (ACRYLIC POLYMER)		800		✓	FLOOR FINISH	
SODIUM SILICATE 52:A M		700	✓		~~FLOOR FINISH~~	ADHESIVE
ADHESIVES		50	✓		ADHESIVE	

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☐ No Action
9 ☐ Other (specify)

EH 651B 3/77

INDUSTRIAL CHEMICAL SURVEY
BUREAU OF WATER POLLUTION CONTROL

Nassau County Department of Health
240 Old Country Road, Mineola, N.Y. 11501 Tel. 535-2404

2645

Part I

Company Name: ZOE CHEMICAL Co. INC.		SIC (if known) Code:	
Company Mailing Address: 1801 FALMOUTH AVE. NEW HYDE PARK			Zip: 11040
Plant Name (if different): 1811 - LIQUID FILL; 1835 WAREHOUSE	Contact Name: AXELROD MEIL		Tel.: 354-1043
Plant Address: GILFORD AVE	Village:	Water Distr.:	Code: Zip:
Principal Business of Plant: AEROSOL FILLERS		No. Employees at this Facility: 40	

Part II

COMPLETE LIST OF CHEMICALS USED (See attached)

PART III - DISCHARGE INFORMATION

WATER

1. Does your plant discharge liquid wastes to a municipally owned sanitary sewer system? If yes, name of system: ☑ Yes ☐ No

2. Is your facility permitted to discharge liquid wastes under a State (SPDES) or Federal (NPDES) permit? If yes, enter Permit No. ☐ Yes ☑ No

3. Do you discharge liquid industrial wastes in any other manner? If yes, explain: ☐ Yes ☑ No

4. If any of the above are yes:
   a. Do you discharge process or chemical wastes, i.e., water used in manufacturing, including direct contact cooling water and scrubber water? ☐ Yes ☑ No
   b. Do you discharge non-contact cooling water? ☐ Yes ☑ No
   c. Do you discharge sanitary wastes? ☑ Yes ☐ No

AIR

1. Does your facility have sources of possible emissions to the atmosphere? ☐ Yes ☑ No

2. Enter location and facility code as shown on your Air Pollution Control Application for Permits & Certification (if applicable): 2 8 2 0 2 2 7 9 0

3. Heating System: ☐ None ☐ Boiler HOT AIR ☐ Space Heater | Type of Fuel: ☐ Electric ☐ Gas ☑ Oil | Incinerator: ☐ Yes ☑ No

SOLID & CONCENTRATED LIQUID WASTES

1. List name and address of firm (incl. yourself) removing wastes other than office and cafeteria refuse (industrial scavenger)

Name	Address	Name	Address
NONE			

2. List location(s) of landfills owned and used by your Facility

		Active	Inactive
a.	NONE		
b.			

PEST

Does this facility manufacture, produce, formulate or repackage pesticides? ☑ Yes ☐ No

Signature (owner, partner, or officer): Meil Axelrod Date:

Name (printed or typed): MEIL AXELROD Title:

Inspector's Name: Michael Schiuta Date of Inspection: 3/3/86

EH 651 4/77

The Nassau County Department of Health is conducting an investigation pursuant to New York State Environmental Conservation Law, 3-0301 (g) (h), 17-0303 (g), 19-0301 (d) and 37-0103, concerning the present practices of industry in Nassau County in relation to certain specific and broad classes of chemicals used in industrial processes.

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company	SIC Code	Water District	Code
ZOE CHEMICAL CO. INC.			

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
BORAX		3,000		✓		
SILICONES		5,000		✓		
FLOW-COAT (STARCH)		40,000		✓	FORMULATE PRODUCT	
PROPYLENE GLYCOL		3,000	✓			
(INSIDE STORAGE TANK 1500 GAL.)						
CARBITOL		4,500	✓			
(INSIDE STORAGE TANK 1500 GAL)		~~4,500~~	~~✓~~			REMAIN IN FINAL PRODUCT
AMMONIA		3,000	*	✓		
VERSENE		800		✓		
DDBSA (DETERGENT OR SOAP)		5,000		✓	COLD WATER WASH	
HARTAMID AO (DETERGENT)		4,000		✓		
CALGON		1500		✓		

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☒ No Action
9 ☐ Other (specify)

EH 651B 3/77

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company	SIC Code	Water District	Code
ZOE CHEM. CO., INC.			

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg. Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
PESTICIDES (INSECTICIDES)					FORMULATE	
McGLOUGHLIN, GORMAN, KING					PRODUCT	
INTERMEDIATES		3500		✓	#862	
PESTICIDE FORMULAS NOT SPECIFIED					2155 ETC.	
IN MIXTURES						REMAIN
ESSENTIAL OIL (FRAGRENCES)		3,000		✓		IN FINAL
						PRODUCT
ISO BUTANE (LIQUID)		70,000	✓		PROPELLANT	
CO_2 (GAS)		2,000			PROPELLANT	

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☐ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☒ No Action
9 ☐ Other (specify)

EH 651B 3/77

LABORATORY REPORT

CHEMICAL EXAMINATION OF INDUSTRIAL AND HAZARDOUS WASTES

Division of Laboratories and Research

Nassau County Department of Health

1 ☐ Routine
2 ☐ Resample
3 ☐ Special
4 ☑ Complaint
5 ☐ Other

B

Lab. No. 2094

Field No. VN64

Source Information (Please Print)

Premises Zoe Chemical

Address 1611 Gilford Ave

Town New Hyde Pk

Collection Point cesspool in rear of bldg parking lot

Sampler's Comments:

	Month	Day	Year
Date Collected	4	9	87
Date Received	APR 9 1987		8
Date Reported			8
Collection Time	12:00 noon		
Collected By:	V. Nigro		

Bureau:
1 ☑ Land Resources Management
9 ☐ Other (specify)

Sample Type:
A ☑ Water
B ☐ Soil
C ☐ Sludge
D ☐ Waste Solvent
E ☐ Oil
F ☐ Other

CHEMICAL EXAMINATION

Check	Metals		Result	Check	Non-Metals		Result
✓	1 Aluminum	mg/l	0.3	15	Chloride	mg/l	
✓	2 Arsenic	mg/l	<0.005	16	Cyanide	mg/l	
✓	3 Barium	mg/l	<0.2	17	Fluoride	mg/l	
✓	4 Cadmium	mg/l	0.003	✓	18 MBAS	mg/l	128.0
✓	5 Chromium, Total	mg/l	0.01	✓	19 pH		6.3
	6 Copper	mg/l		20	Phenols	mg/l	
✓	7 Iron, Total	mg/l	4.25	21	Solids, Suspended	mg/l	
✓	8 Lead	mg/l	0.05	22	Solids, Total Diss.	mg/l	
✓	9 Manganese	mg/l	<0.05	23	Sulfate	mg/l	
	10 Mercury	mg/l		✓	24 Ammonia nitrogen	mg/l	9.8
✓	11 Nickel	mg/l	<0.05	25	Kjeldahl nitrogen	mg/l	
✓	12 Selenium	mg/l	<0.005	26	Nitrite nitrogen	mg/l	
	13 Silver	mg/l		27	Nitrate nitrogen	mg/l	
✓	14 Zinc	mg/l	5.0	28	Total Phos.	mg/l	

SPECIAL ANALYSIS

Check	Constituent		Result
29	Chromium hex.	mg/l	
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
41			
42			

Examiner's Comments

APR 3

DI 212 482

DH-5021. 7/84

NASSAU COUNTY DEPARTMENT OF HEALTH
DIVISION OF LABORATORIES AND RESEARCH
ENVIRONMENTAL HEALTH LABORATORIES

TRACE ORGANICS

Access Number: 870333
Source: ZOE CHEMICAL - 1811 GILFORD AV., NEW HYDE PARK
Matrix: WATER
Site: CESSPOOL REAR OF BLDG
Date Sampled: 04/09/87
Date of Report: 04/23/87

VOLATILE HALOGENATED	MRC (ug/l)		RESULT (ug/l)
TRICHLOROFLUOROMETHANE	20	<	20
METHYLENE CHLORIDE			
1,1-DICHLOROETHYLENE			
1,1,2-TRICHLOROTRIFLUOROETHANE	160	<	160
c & t-1,2-DICHLOROETHYLENE	100	<	100
1,1-DICHLOROETHANE	80	<	80
CHLOROFORM	20	<	20
1,1,1-TRICHLOROETHANE	20	<	20
CARBON TETRACHLORIDE	20	<	20
TRICHLOROETHYLENE	20	<	20
BROMODICHLOROMETHANE	20	<	20
c-1,3-DICHLOROPROPENE			
DIBROMOCHLOROMETHANE	40	<	40
1,1,2-TRICHLOROETHANE	20	<	20
1,2-DIBROMOETHANE	NA		NA
TETRACHLOROETHYLENE	20	<	20
BROMOFORM	20		42

VOLATILE AROMATICS	MRC (ug/l)		RESULT (ug/l)
BENZENE	30	<	30
TOLUENE	60	<	60
CHLOROBENZENE	60	<	60
ETHYLBENZENE	140		180
XYLENE (o,m,p)	240		330
DICHLOROBENZENE (o,m,p)	500	<	500

MRC - MINIMUM REPORTABLE CONCENTRATION NA - NOT ANALYZED
NR - NO RESULT DUE TO TECHNICAL REASONS - RESAMPLE SUGGESTED
PPB: AIR - nl/l WATER - ug/l SOIL - ng/g

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 3 - BULK AND CONTAINER STORAGE REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No.of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, New Hyde Park NY 11040

Action: ☒ Register Existing Area ☐ Add Area ☐ Remove Area ☐ Modify Area — Area No. S1

Location: ☒ Indoors ☐ Outdoors | Bulk Storage Max.Quantity Stored: 40,000 165 | Container Storage Max.No. 110 Max.Vol. 5400 gal

Secondary Containment: ☐ Impervious Berm/Dike ☒ Impervious Floor/Pad ☒ Roof ☒ Walls ☐ Floor Drain & Storage Tank ☐ None ☐ Other (Specify):

Construction Material of Dike & Pad (Check all that Apply) ☒ Concrete ☐ Steel ☐ Other (Specify): — Security ☒ Yes ☐ No

Type	NCDH Number	Material Name	Physical State	Amount Stored: Average Quantity	Amount Stored: Units	Storage Method: Average Number	Storage Method: Type
1	8153	Sodium Hydroxide	1	25	1	1	1
1	7773	Silicones	1	600	1	12	1
1	01191	Butyl Cellosolve	1	100	1	2	
1	6551	Fragrances - Perfumes	1	40	1	8	2
1	~~2098~~	Triton X-100	1	150		3	2
1	2099 (Industrial 106)	Industrial	1	50	1	1	
1	8430	[illegible]	1	450		9	
1	8592	Perchloroethylene	1	100	1	2	2
1	5772	Methylene chloride	1	100		2	
1	11441	Morpholine	1	50	1	1	2
1	9191	Triethanol amine	1	50	1	1	
1	~~2100~~	D-trans- intermediate 1862	1	150		3	2
1	~~2101~~	Pine oil	1	50		1	
1	~~6870~~	Multicide Intermediate	1	150	1	3	2
1	9721	Butyl carbitol	1	50		1	
1	4711	Hexylene glycol	1	50	1	1	2
1	~~2102~~	Polyoxyethylene tridecyl ether	1	100		2	
1	~~2103~~	Flo Kote 34	1	3000	3	60	5
1	8103	Sodium Hexametaphosphate	1	250	3	5	~~5~~
1	1423	Borax	1	1000	3	20	
1	~~2104~~	Petrolite	1	250	3	5	
1	~~2105~~	Industrine 50-16	1	1250	3	27	6
1	~~9681~~	Epolene wax	1	1000	3	22	5

Date Submitted: Neil Received 4/27/87

Page ___ of ___

☐ D.P.

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No. of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, Newhyde Park NY

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Additional Information for Abandoned Tanks: Condition
1	30	3	1000	1	9	2	1	1	20977	Liquid Petroleum	5	1968	8	5	1	5	1		
1	31	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	32	3	1000	1	9	2	1	1	20977		5	rough approx.	8	5	1	5	1		
1	33	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	34	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	35	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	36	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	37	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	28	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	39	3	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
1	40	5	1000	1	9	2	1	1	20977		5		8	5	1	5	1		
		3									1	1968							

'5' = other

EH 858 4/86 Date Submitted _____ Page ___ of _____ ☐ D.P.

Neil Reviewed 4/27/87

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No.of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, New Hyde Park NY 11040

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Additional Information for Abandoned Tanks: Condition
1	16	1	300	1	9	9	1	1	15680	Not in use	2	1966 - 1987	8	8	2	3	1		
1	17	1	300	1	9	9	1	1	15680	Not in use	2		8	8	2	3	1		
1	8	1	300	1	9	9	1	1	15680	Not in use	2		8	8	2	3	1		
1	19	1	200	1	9	9	1	1	6551	Air Preheater	1		8	8	2	3	1		
1	20	1	200	1	9	9	1	1	6551	Air Preheater	1		8	8	2	3	1		
1	21	1	200	1	9	9	1	1	6551	Air Preheater (not in use)	1		8	8	2	3	1		
1	22	1	500	1	9	9	1	1	10741	Spray unit	1		8	8	2	3	1		
1	23	1	500	1	9	9	1	1	6551	Fuel oil tank	1		8	8	2	3	1		
1	24	1	500	1	9	9	1	1	6551	Air preheater	1		8	8	2	3	1		
1	25	1	200	1	9	9	1	1	6551	Furnace oil tank	1		8	8	2	3	1		
1	26	3	1000	1	9	2	1	1	20977	Lube oil	5	rough approximation 1968	8	5	1	5	1		
1	27	3	1000	1	9	2	1	1	20977		5	01/68 1968	8	5	1	5	1		
1	28	3	1000	1	9	2	1	1	20977		5	1968	8	5	1	5	1		
1	29	3	1000	1	9	2	1	1	20977		5	1968	8	5	1	5	1		

UNK = unknown

EH 858 4/86 Date Submitted _____ Page ____ of _____ ☐ D.P.

Neil Greenok 4/27/87

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

RECEIVED

For Office Use Only

Date Application Received MAR 5 1987

Facility I.D. 1026

Reviewed By NCDH — BLRM

Date Reviewed 3/26

Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved

No. of Months

Facility Name ZOE CHEMICAL CO., INC.

Facility Address 1801 FALMOUTH AVENUE, NEW HYDE PARK, N.Y. 11040

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Condition
1	1	4	5,000	1	2	2	2	1	15831	ISOPAR L	15	9/17/75	5	5	1	2	1		
1	2	4	5,000	1	2	1	2	1	4771	ISOPROPANOL	15	3/7/66	5	5	1	2	1		
1	3	4	5,000	1	2	2	2	1	4771	ISOPROPANOL/ METHANOL	15	5/3/78	5	5	1	2	1		
1	4	4	3000	1	9	9	1	1	64721	[illegible]	15	sometime between	5	5	1	2	1		
1	5	1	250	1	9	9	1	1	9681	Floor Wax	1	1966 & 1987	8	8	UNK	3	1		
1	6	1	250	1	9	9	1	1	9681	Floor Wax	1	12/65	8	8	UNK	3	1		
1	7	1	250	1	9	9	1	1	9681	Floor Wax	1		8	8	UNK	3	1		
1	8	1	1000	2	9	9	9	1	9681	Floor Wax	1		8	8	UNK	3	1		
1	9	1	1000	1	9	9	1	1	9681	Floor Wax	1		8	8	UNK	3	1		
1	10	1	1000	1	9	9	1	1	9681	Floor Wax	1		8	8	UNK	3	1		
1	11	1	1000	1	9	9	1	1	9681	"	1		8	8	UNK	3	1		
1	12	1	1000	1	9	9	1	1		"	1		8	8	UNK	3	1		
1	13	1	1000	1	9	9	1	1	9681	"	1		8	8	UNK	3	1		
1	14	1	1000	1	9	9	1	1		"	1		8	8	UNK	3	1		
1	15	1	500	1	9	9	1	1	9681	Floor Wax	1		8	8	UNK	3	1		

UNK = unknown

EH 858 4/86

Date Submitted 3/3/87

Page 1 of 1

☐ D.P.

Mail Approved 4/27/87

INVESTIGATION SUMMARY

Bureau of Land Resources Mgmt.

Nassau County Dept. of Health

Date Opened: 10/15/90

Received by: ☐ Phone ☐ Mail ☐ Walk-In ☐ Survey

Reason for Investigation: ☐ Complaint ☐ Survey ☐ Permit ☐ Other

Reinsp. Dates: 1. 2. 3.

Location of Complaint: Address S. Corner Falmouth & Gould; City or Town New Hyde Park; Census Tract

Notified of Confidentiality ☐ Yes ☐ No

Investigation ☐ Prev.Closed ☐ New ☐ In Proc.

Date Closed

COMPLAINANT

Name: Steven Gipot USEPA

Address: Apt.#

City or Town: Tel. 212 264-3774

Name (owner):

Address: Apt.#

City or Town: Tel.

NATURE OF COMPLAINT

☐ Oil Spill ☐ Discoloration ☐ Odor ☐ Jelly Fish ☐ Industrial Waste

☐ Dead Fish, Birds, Ducks ☐ Garbage ☐ Sewage ☐ Scum ☐ Other (specify)

Specify (Where Necessary)

Acron Gun Joe Chemical
20 Drums dimethylfloyd maroether
2 acid drums stued unfinced
drums seen on Sunday

INSPECTION REPORT

Violation ☐ Yes ☐ No

Violation Notice Issued? ☐ Yes ☐ No Date

Violation ☐ N.C.Pub.Health Law ☐ N.Y.S.Sanitary Code ☐ N.Y.S.DEC.Law

Dye Test Performed? ☐ Yes ☐ No

Results ☐ Pos. ☐ Neg

Sample Taken ☐ Yes ☐ No

Total

Lab.#

Date Viol.Corrected:

Total Complaints Resolved:

Case Solution: ☐ Oper.Discont. ☐ New System ☐ System Repaired ☐ No Action

Referred to:

Date

Date	COMMENTS AND ACTION TAKEN	Sign.
10/16/90	Alex Apelrod - owner Joe Spoke with him and then surveyed the area, There were no drums there now. Alex stated the building next to him had a overflow of oil from the vent line when accidentally the fuel oil tank was overfilled. The spilled oil was sucked up and put in drums that were stocked on the street until it could be removed. This may have been the drums in gestion,	
10/17/90	called Complaint left message with Sec.	
10/18/90	" " " " " Spoke to Complaint Satisfied	

Complainant Notified by: ☐ Letter ☐ Phone ☐ Visit

Approved by: AS

Date 10/18/90

R. Wells

EH 613A 10/86

AB

Field Investigation
Article XI Facility
Nassau County Department of Health

☐ Initial System Test ☐ Tank Removal
☐ Tank Only ☐ Installation
☐ System Retest ☐ Periodic Year:
☐ New Installation ☑ Abandonment

Date of Job 12-21-92 Time _____ Facility ID# 1006
Date Received 12-18-92 Time _____ Confirmation# 356 H92 A07
Contractor ANS Spill# _____
Telephone # 249-5443

Establishment Name ZOE Chemical Co.
Address 1801 Falmouth Ave.
Town New Hyde Park Telephone # _____
Cross Street: _____
No. of Tanks 1 Type of Test _____

Tank #							
System Test							
Tank Test							
Size							
Product							
Leak Rate							
Pass/Fail							
Fee							
Fee Paid							
Retest Needed							

Tank Removal

Tank #	4						
Visible Hole							
# Holes							
Size	2K F.C.						
Location							
Photo							

Excavation: __ Clean __ Contaminated Soil __ Free floating oil

Soil Removed (Y/N)___ Amount _____

Installation: Tank size _____ Approved plans __ Yes __ No

Notes:
NCDH attended. Tank cut, cleaned & back-filled with inert composite mixture. ABrussel

Inspector Alan Brussel Supervisor _____

Employee Number 114 Date 12-21-92 ☐ Continued on Reverse Side

1 - Piping 2 - Tank ☑ Computer Entry
3 - Fitting 4 - Other ☑ Data Book Entry

EH907 6/91

212-347-6900
516-354-1043

ZOË CHEMICAL CO., INC.
MANUFACTURERS OF
HOUSEHOLD & INDUSTRIAL CHEMICALS
1801 FALMOUTH AVE., NEW HYDE PARK, N. Y. 11040

7/31/78

NASSAU COUNTY DEPT. OF PUBLIC HEALTH
BUREAU OF WASTE WATER MANAGEMENT
240 OLD COUNTRY ROAD
MINEOLA,N.Y.

Dear Mr. Mangino;

As per our phone conversation please be advised that I have just spoken to the Nassau County Dept. of Public Works(Sewers & Sanitation)a Mr. Burke who advised that he is sending me an application for us to fill out to have our system connected to the Nassau County Sewer line. Upon reciept of our application he will let us know what will happen next. I will keep you informed as they do. Thank you.

Very truly yours;
Neil Axelrod
NEIL AXELROD

THOMAS S. GULOTTA
COUNTY EXECUTIVE

NASSAU COUNTY
DEPARTMENT OF HEALTH
240 OLD COUNTRY ROAD, MINEOLA, N.Y. 11501

Date: February 24, 1987

Zoe Chemicals Co., Inc.
1801 Falmouth Avenue
New Hyde Park, N.Y. 11040

Attn: Mr. Neil Axelrod

Gentlemen:

In order to protect the ground and surface waters of Nassau County, the Board of Health adopted a Public Health Ordinance (Article XI), titled Toxic and Hazardous Materials Storage, Handling and Control. This Ordinance provides for the registration and regulation of toxic and hazardous materials stored in underground or aboveground tanks, containers or in bulk.

Toxic or hazardous materials, which are specifically defined in the Article XI Regulations, include any substance, solution or mixture, including petroleum products, which present an actual or potential hazard to human health or a threat to the quality of either the underground drinking water supply or surface waters if discharged to the land or waters of Nassau County.

Registration is mandated whenever the following minimum total storage capacities exist at a facility:

- 250 gallons or more of one or more toxic or hazardous materials including chemicals, fuel oil (see Note), and other oils
- 50 gallons or more of halogenated hydrocarbons
- more than 27.5 gallons or 220 pounds of toxic or hazardous waste
- bulk (dry) storage exceeding 2,000 pounds of toxic or hazardous materials

Our records indicate that your facility may fall under the provisions of the Ordinance. Please complete Form 1 (General Information). Form 2 (Tank Registration) and/or Form 3 (Bulk and Container Storage Registration) should be completed if tank and/or bulk and container storage exists at your facility. Refer to the enclosed instructions for filling out the forms.

Note: Registration is not required for a facility where fuel oil used solely for on-site heating is the only toxic or hazardous material stored and the total storage capacity is 1,100 gallons or less. Nevertheless, Forms 1 and 2 must still be completed and returned as indicated above.

(over)

The completed forms must be returned within 2 weeks of the above date to:

Nassau County Department of Health
Bureau of Land Resources Management
240 Old Country Road
Mineola, N.Y. 11501

Your application will be reviewed and a determination made as to whether or not your facility is subject to the Ordinance. If it is, you will receive a fee statement that reflects the number of tanks and/or storage areas and the duration of the permit. You will have to pay this fee in order to register your facility and obtain the required permit.

Failure to comply with the above could result in legal action as mandated by the Ordinance.

Forms identical to those enclosed may have also been sent to you by your fuel oil supplier or this Department. If so, return only one completed copy of the applicable forms to this Department.

If you have any questions, you may contact the Department at (516) 535-2406 between 9 AM and 4:45 PM on weekdays.

Sincerely yours,

John J. Dowling, M.D.

John J. Dowling, M.D., M.P.H.
Commissioner

Enclosures

FILE ART XI

718-347-6900
516-354-1043

ZOË CHEMICAL CO., INC.
MANUFACTURERS OF
HOUSEHOLD & INDUSTRIAL CHEMICALS
1801 FALMOUTH AVE., NEW HYDE PARK, N. Y. 11040

NASSAU COUNTY DEPT. OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA,N.Y. 11501

4/7/88

Dear Mr. Sekreta;

This will confirm our meeting on 4/7/88 of the following;

1) Zoe Chemical Company has an E.P.A. I.D. # NYD002033108.

2) Marine Pollution Control,Inc. will be doing our removal of waste material. This should be completed by the end of next week.

3) Orchard Sewer Company will be making the sewer connection within the next 2 weeks.

Very truly yours;
NEIL AXELROD

To

NASSAU COUNTY DEPT. OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501

From

ZOË CHEMICAL CO., INC.
1801 FALMOUTH AVENUE
New Hyde Park, NY 11040
516 FL 4-1043 718 FI 7-6900
FAX # 516-488-2281

SUBJECT

DATE 8/9/88

Reply Message

FOLD

MESSAGE

Dear Mr. Willis;

Enclosed please find validated copies of 1801 Falmouth Avenue building which is in the hands of the Health Dept. as illustrated by their stamped validation on the upper right hand side. Thank you.

Very truly yours;

SIGNED Neil Axelrod

NEIL AXELROD

REPLY

DATE OF REPLY

SIGNED

RECIPIENT

NASSAU COUNTY DEPARTMENT OF HEALTH — NASSAU COUNTY PUBLIC HEALTH ORDINANCE - ARTICLE XI

APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT

FORM 1 - GENERAL INFORMATION

SEE INSTRUCTION SHEET

MAR 5 1987

NCDH — BLRM

For Office Use Only

Facility I.D. 1216

☐ Municipal

☒ Non-Municipal

Check all that apply to your facility: ☒ Tank Storage ☐ Container Storage ☐ Bulk Storage ☐ Storage of Road De-icing Materials

Reason for submitting application: ☒ New ☐ Renewal ☐ Change ☐ Construction

Facility Name	Street Address	Village	State	Zip	Phone
ZOE CHEMICAL CO.,INC.	1801 FALMOUTH AVENUE	NEW HYDE PARK	N.Y.	11040	354-1043
Facility Mailing Address (If different from above)		Facility Contact Person (Name & Title)			Phone
SAME		NEIL AXELROD,VICE PRESIDENT			354-1043
Facility Owner	Street Address	Village	State	Zip	Phone
SAME	SAME				
Property Owner (If not Facility Owner)	Street Address	Village	State	Zip	Phone
SEABOARD ESTATES INC.	1 JERICHO TURNPIKE	NEW HYDE PARK	N.Y.	11040	FL 4 4300
Tank Owner (If not Facility Owner)	Street Address	Village	State	Zip	Phone

Name that should appear on Permit (Permittee)
(If different from Facility Owner)

Permittee's Street Address	Village	State	Zip	Phone

Permittee's Relationship to Facility Owner: ☒ Same ☐ Operator of Facility ☐ Other (Specify):

Principal Property Tax Code:	School District No.	Section	Block	Lot
	5	8	189	1

Forms Attached (Check all that apply) ☒ Form 2 - Tank Registration ☐ Form 3 - Bulk & Container Storage Registration ☐ Form 4 - Storage of Road De-icing Materials

I hereby affirm under penalty of perjury that the information provided on this form and on any attached forms, statements and exhibits is true to the best of my knowledge and belief.

Print Name	Signature	Title
NEIL AXELROD	Neil Axelrod	VICE PRESIDENT

EH 857 4/86

4/7/87

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

RECEIVED
For Office Use Only

Date Application Received MAR 5 1987

Facility I.D. 1006

Reviewed By NCDH — BLRM

Date Reviewed 3/6/87

Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved

No. of Months

Facility Name ZOE CHEMICAL CO., INC.

Facility Address 1801 FALMOUTH AVENUE, NEW HYDE PARK, N.Y. 11040

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Additional Information for Abandoned Tanks: Condition
1	1	4	5,000	1	2	2	2	1		ISOPAR L	1	9/17/75	5	5	1	2	1		
1	2	4	5,000	1	2	1	2	1		ISOPROPANOL	1	3/7/66	5	5	1	2	1		
1	3	4	5,000	1	2	2	2	1		ISOPROPANOL/ ~~METHANOL~~	1	5/3/78	5	5	1	2	1		
1	4	4	3000	1	9	9	1	1		#2 Fuel Oil	1	sometime between 1966 & 1987	5	5	1	2	1		
1	5	1	250	1	9	9	1	1		Floor Wax	1		8	8	UNK	3	1		
1	6	1	250	1	9	9	1	1		Floor Wax	1		8	8		3	1		
1	7	1	250	1	9	9	1	1		Floor Wax	1		8	8		3	1		
1	8	1	1500	2	9	9	9	1		Floor Wax	1		8	8		3	1		
1	9	1	1000	1	9	9	1	1		Floor Wax	1		8	8		3	1		
1	10	1	1000	1	9	9	1	1		Floor Wax	1		8	8		3	1		
1	11	1	1000	1	9	9	1	1		"	1		8	8		3	1		
1	12	1	1000	1	9	9	1	1		"	1		8	8		3	1		
1	13	1	1000	1	9	9	1	1		"	1		8	8		3	1		
1	14	1	1000	1	9	9	1	1		"	1		8	8		3	1		
1	15	1	500	1	9	9	1	1		Floor Wax	1		8	8		3	1		

UNK = unknown

EH 858 4/86

Date Submitted 3/3/87

Page 1 of 1

☐ D.P.

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No. of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, New Hyde Park NY 11040

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Additional Information for Abandoned Tanks: Condition
1	16	1	300	1	9	9	1	1		Not in use	2	1966 - 1987	8	8	UNK	3	1		
1	17	1	300	1	9	9	1	1		Not in use	2		8	8		3	1		
1	18	1	300	1	9	9	1	1		Not in use	2		8	8		3	1		
1	19	1	200	1	9	9	1	1		Air Freshner	1		8	8		3	1		
1	20	1	200	1	9	9	1	1		Air Freshner	1		8	8		3	1		
1	21	1	200	1	9	9	1	1		Air Freshner & various finished products	1		8	8		3	1		
1	22	1	500	1	9	9	1	1		Spray Starch	1		8	8		3	1		
1	23	1	500	1	9	9	1	1		Fabric Finish	1		8	8		3	1		
1	24	1	500	1	9	9	1	1		Air Freshner	1		8	8		3	1		
1	25	1	200	1	9	9	1	1		Furniture Polish	1		8	8		3	1		
1	26	3	1000	1	9	2	1	1		Liquid Petroleum		Rough approximation 1968	8	5	1	5	1		
1	27	3	1000	1	9	2	1	1				1968	8	5	1	5	1		
1	28	3	1000	1	9	2	1	1				1968	8	5	1	5	1		
1	29	3	1000	1	9	2	1	1				1968	8	5	1	5	1		

UNK = unknown

EH 858 4/86

Date Submitted _____ Page ____ of _____ ☐ D.P.

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 2 - TANK REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No. of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, Newtyde Park NY

Action	Tank Number	Location	Design Capacity (Gallons)	Material of Construction	Internal Protection	External Protection	Piping	Material Currently or Last Stored: Type	Material Currently or Last Stored: NCDH Number	Material Currently or Last Stored: Name	Status	Tank Installation Date (Month/yr)	Leak Detection	Secondary Containment	Product Gauge	Dispenser Method	Fill	Additional Information for Abandoned Tanks: Date Last Used (Month/yr)	Additional Information for Abandoned Tanks: Condition
1	30	3	1000	1	9	2	1	1		Liquid Petroleum	1	1968	8	5	1	5	1		
1	31	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	32	3	1000	1	9	2	1	1			1	rough approximation	8	5	1	5	1		
1	33	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	34	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	35	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	36	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	37	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	38	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	39	3	1000	1	9	2	1	1			1		8	5	1	5	1		
1	40	3	1000	1	9	2	1	1			1		8	5	1	5	1		
											1	1968							
	-																		

"5" = other

EH 858 4/86

Date Submitted _____

Page ____ of _____

☐ D.P.

NASSAU COUNTY DEPARTMENT OF HEALTH
APPLICATION FOR A TOXIC OR HAZARDOUS MATERIALS STORAGE FACILITY PERMIT
FORM 3 - BULK AND CONTAINER STORAGE REGISTRATION
SEE INSTRUCTION SHEETS

For Office Use Only	
Date Application Received	Facility I.D.
Reviewed By	Date Reviewed
Action: ☐ Not Req'd. ☐ Approved ☐ Disapproved	No.of Months

Facility Name: Zoe Chemical

Facility Address: 1801 Falmouth Ave, New Hyde Park NY 11040

Action: ☒ Register Existing Area ☐ Add Area ☐ Remove Area ☐ Modify Area — Area No. S1

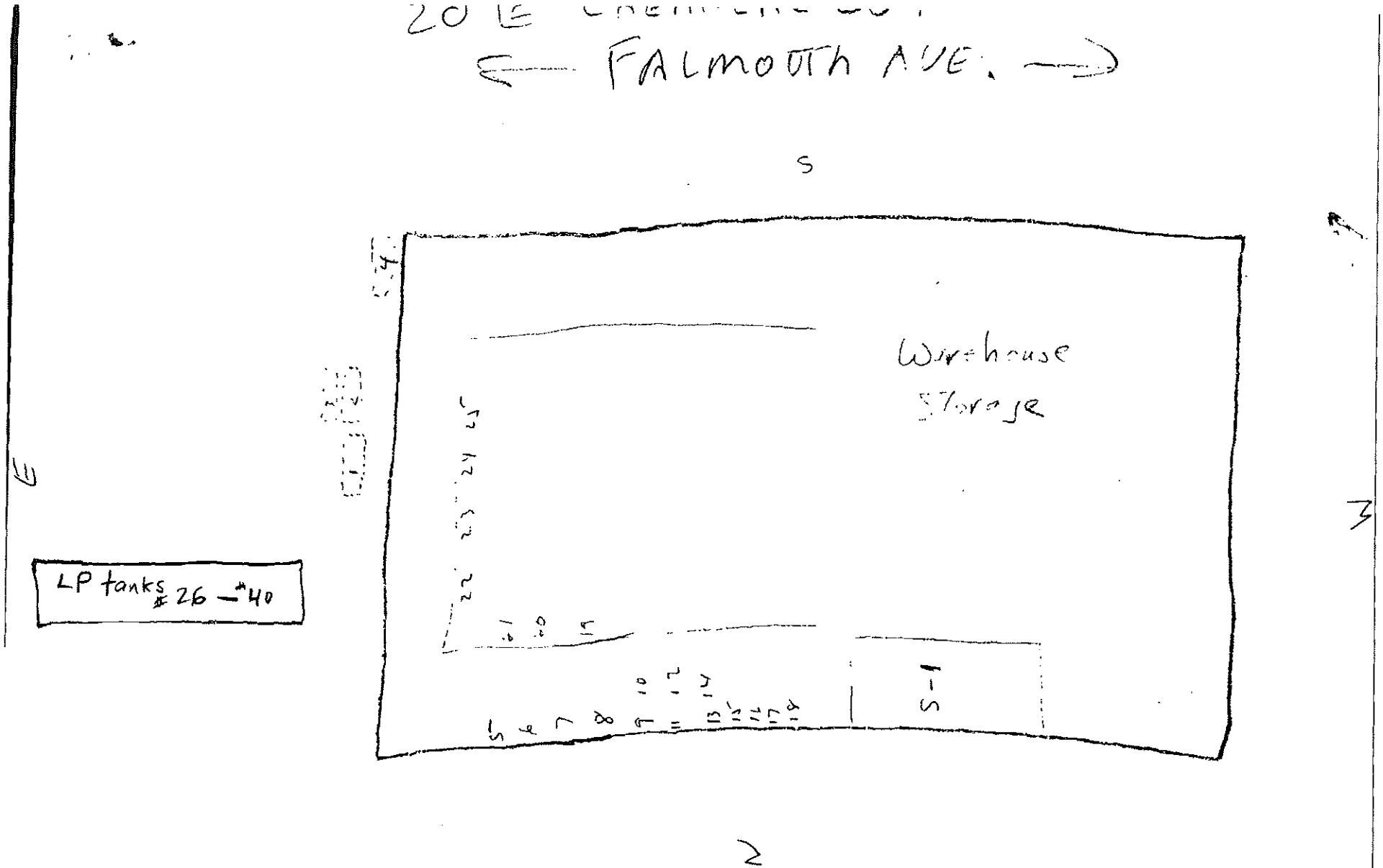
Location: ☒ Indoors ☐ Outdoors — Bulk Storage Max.Quantity Stored: 40,000 lbs — Container Storage Max.No. 110 Max.Vol. 5400 gal

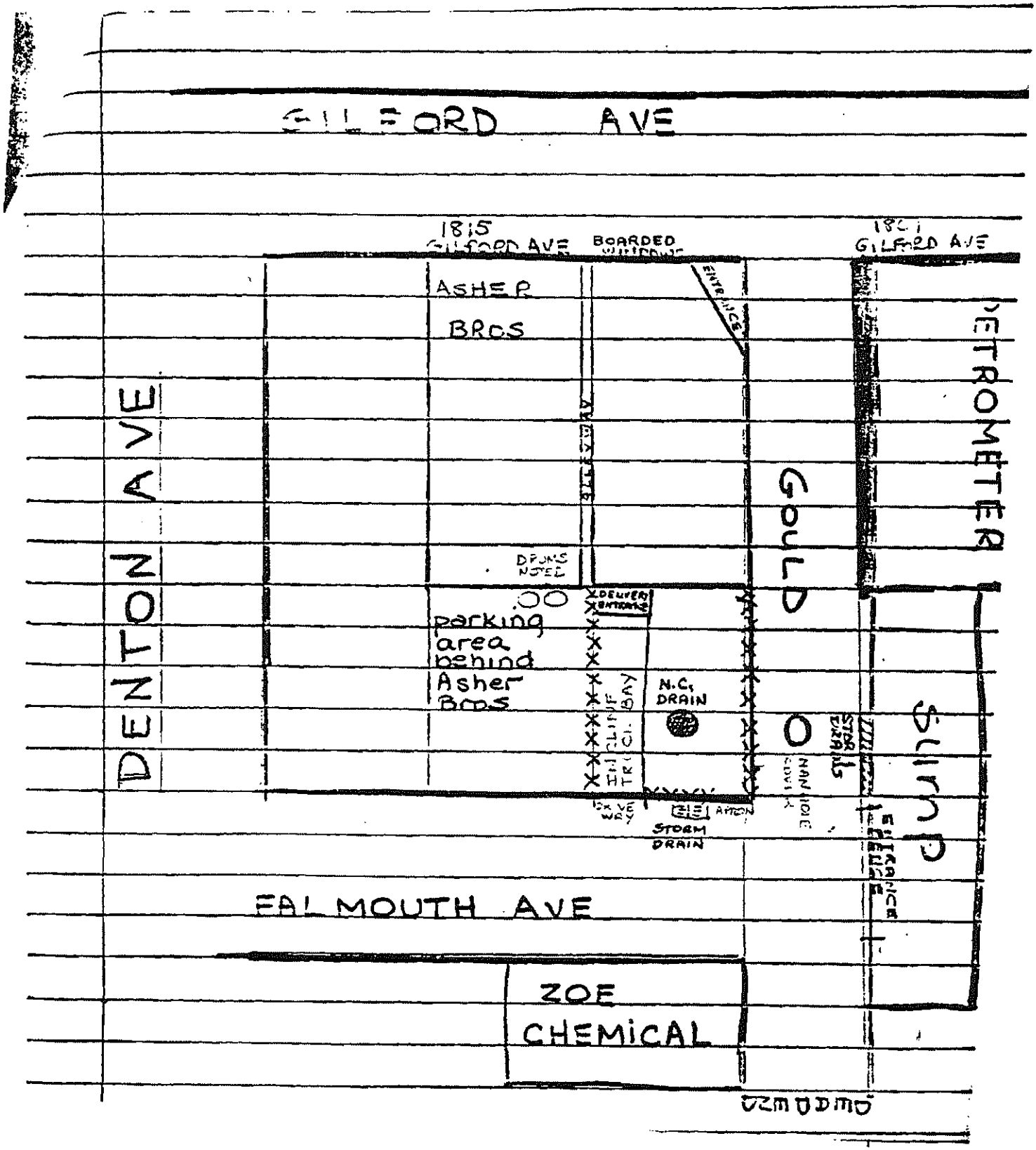
Secondary Containment: ☐ Impervious Berm/Dike ☒ Impervious Floor/Pad ☒ Roof ☒ Walls ☐ Floor Drain & Storage Tank ☐ None ☐ Other (Specify):

Construction Material of Dike & Pad (Check all that Apply): ☒ Concrete ☐ Steel ☐ Other (Specify): — Security ☒ Yes ☐ No

Type	NCDH Number	Material Name	Physical State	Amount Stored: Average Quantity	Amount Stored: Units	Storage Method: Average Number	Storage Method: Type
1		Sodium Hydroxide	1	25	1	1	1
1		Silicones	1	600		12	
1		Butyl cellosolve	1	100		2	
1		Fragrances - Perfumes	1	240		8	2
1		Triton-X-100	1	150		3	
1		Industrene 106	1	50		1	
1		surfactants	1	450		9	
1		Perchloroethylene	1	100		2	
1		Methylene Chloride	1	100		2	
1		Morpholine	1	50		1	
1		Triethanol amine	1	50		1	
1		D-trans- intermediate 1862	1	150		3	
1		Pine oil	1	50		1	
1		Multicide Intermediate	1	150		3	
1		Butyl carbitol	1	50		1	
1		Hexylene Glycol	1	50		1	
1		Polyoxyethylene Tridecyl ether	1	100		2	
1		Flokote 64	1	3000	3	60	hose
1		Sodium Hexameta phosphate	1	250	3	5	pails
1		Borax	1	1000	3	20	
1		Petrolite	1	250	3	5	
1		Industrene 50-16	1	1250	3	27	1
1		Epolene wax	1	1000	3	22	"

BH 859 4/86 — Date Submitted — Page of — ☐ D.P.


FALMOUTH AVE.
Warehouse
Storage
LP tanks #26 - #40


GILFORD AVE
1815 GILFORD AVE
BOARDED
1821 GILFORD AVE
ENTRANCE
ASHER BROS
DENTON AVE
DEAN'S MOTEL
parking area behind Asher Bros
ENTRANCE
DRIVE WAY
N.C. DRAIN
STORM DRAIN
GOULD
STORM DRAIN
MANHOLE
ENTRANCE
PETROMETER
FALMOUTH AVE
ZOE CHEMICAL

NASSAU COUNTY
DEPARTMENT OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501-4250

May 7, 1991

CERTIFIED MAIL
Mr. Neil Axelrod, Vice-President
Zoe Chemical Co., Inc.
1801 Falmouth Ave.
New Hyde Park, N.Y. 11040

NOTIFICATION OF VIOLATION

RE: ENFORCEMENT CONFERENCE
VIOLATION OF ARTICLE XI OF THE
NASSAU COUNTY PUBLIC HEALTH ORDINANCE
ZOE CHEMICAL CO., INC.
1801 FALMOUTH AVE.
NEW HYDE PARK, N.Y.
ID# 1006

Dear Mr. Axelrod:

The Article XI permit for your facility lists an underground fuel oil storage tank. According to the age of this tank, it was to have been tested for tightness by August 1, 1987, as required by Section 10.c. of Article XI of the Nassau County Public Health Ordinance. Our records indicate that this has not been done.

This is to inform you that your facility is in violation of the above Article as follows:

Failure to have a tightness test performed on an underground petroleum storage tank 5 to 9 years of age . (Section 10.c.1)

The fine for this violation is up to $500 per day.

Accordingly, you are hereby summoned to appear at a Department enforcement conference at 9:30 a.m., on May 22, 1991 , at 240 Old Country Rd., fifth floor, Mineola, New York. Failure to appear will result in further legal action.

If you have any questions you may contact Ms. Susan King at (516) 535-3314.

Very truly yours,

Marlena M. Hamann

Marlena M. Hamann
Director/Enforcement Coordinator
Bureau of Land Resources Management

Seaboard Estates, Inc.

ONE JERICHO TURNPIKE
NEW HYDE PARK, N.Y. 11040

(516) 354-4300

well waiver granted 10/22/92 Abandonment must be done within 90 days. RR

ZOE Chemical Co Inc

September 2, 1992

Thomas R. Norris
Bureau of Land Resources Management
Nassau County Department of Health
240 Old Country Road
Mineola, New York 11501-4250

Re: Facility ID 1006

Dear Mr. Norris:

Seaboard Estates, Inc. hereby requests that you allow us to abandon a 2000 gallon oil tank located at 1801 Falmouth Avenue, New Hyde Park.

The tank we propose to abandon is located next to the foundation. To remove this tankcould cause severe structural damage to the building. In lieu of a monitoring well, we would like to do a tightness test.

Thank you for your consideration. Please let us know if we can answer any questions for you.

Very truly yours,

SEABOARD ESTATES, INC.

Laurence P. Gordon, V.P.

LPG:EB

TANK & ENVIRONMENTAL SERVICES

October 2, 1992

Mr. Tom Norris
Nassau County Dept. Of Health
240 Jericho Tpke.
Mineola, NY 11501

Zoe Chem

Re: 1801 Falmouth, New Hyde Park

Gentlemen:

Wrong!

Enclosed herewith please find a copy of the results for the tank test taken at the above mentioned location on September 28, 1992. Results are as follows:

Tank Identification:	Fac. I.D. 01214
Type of Test:	Horner Ezy-Check
Date of Test:	September 28, 1992
Type of Fuel:	#2 Fuel Oil
Leakage Indicated:	.-017/Passed
Contamination Found:	None

ID S/B 01006

If you have any questions or require any further information please contact the undersigned.

Sincerely,

Tricia Macrelli

111 Dale Street • West Babylon, New York 11704 • TEL: (516) 249-5443 • FAX: (516) 249-3798

DATA CHART FOR TANK SYSTEM TIGHTNESS TEST
(EZY CHEK)

NK-BOILER-ENVIRONMENTAL SERVICES
RESIDENTIAL • COMMERCIAL • INDUSTRIAL

CLIENT
NAME OF SUPPLIER, OWNER OR DEALER: Gordon
ADDRESS (NO. & STREET): 1891 Falmouth
CITY AND STATE: New Hyde Park

DATE OF TEST: 9-28-92
WEATHER: Cloudy
TEMPERATURE: 60's

TANK INFORMATION
CAPACITY (NOMINAL): 2000 GALS.
CAPACITY (CHART): ____ GALS.
DIMENSIONS: DIAMETER: 64
LENGTH: ____

SIZE OF FILL OR TEST OPENING: 2 IN.
TOP OFF TIME: ____ GALLONS: ____
NUMBER OF GALLONS ADDED TO START TEST: 13
TANK NO.: ____
INCHES OF WATER – BEFORE TEST: 0" AFTER TEST: 0"

CONTENTS (PRODUCT): #2
TANK MATERIAL: Steel
APPROX. AGE: ____
PUMP SYSTEM (TYPE): Suction

TEST CALIBRATION
SIZE OF CAL. BAR OR ML'S ADDED: .05 ÷ 30 (ALM) = .00166 (FACTOR A)

LINE MOVEMENT

1	6	to 36	= 30	LINES
2	36	to 66	= 30	LINES
3	66	to 96	= 30	LINES
	TOTAL	90	LINES ÷ 3 = 30 (ALM)	LINES

END OF TEST CALIBRATION
SIZE OF CAL. BAR OR ML'S ADDED: ____ ÷ ____ (ALM) = ____ (FACTOR A)

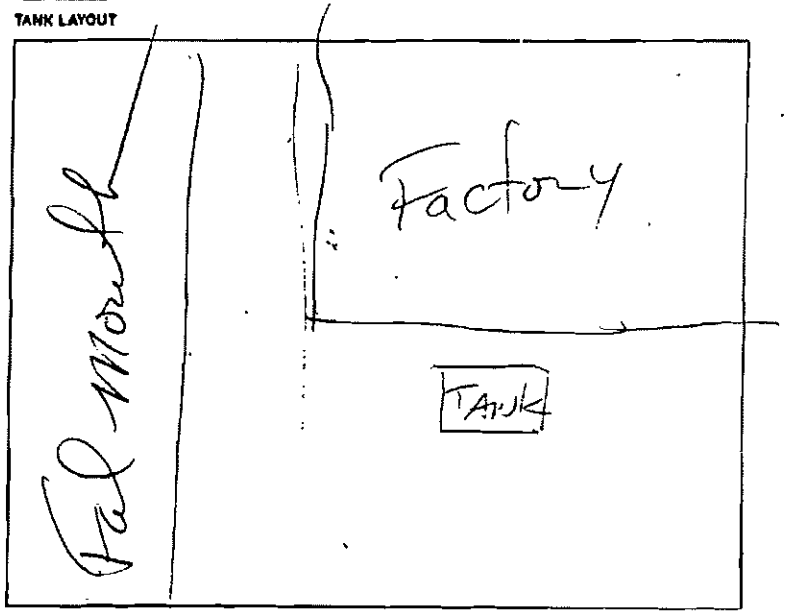
LINE MOVEMENT

1	____	to ____	= ____	LINES
2	____	to ____	= ____	LINES
3	____	to ____	= ____	LINES
	TOTAL	____	LINES ÷ 3 = ____ (ALM)	LINES

MEASURED API SPECIFIC GRAVITY: 34
PRODUCT TEMPERATURE: 66
API SPECIFIC GRAVITY @ 60° F: 33.6 (FROM TABLE A)
COEFFICIENT OF EXPANSION: .00045714 (FROM TABLE B)

.00045714 (C.O.E.) x 2008 (TOTAL CAPACITY (GAL.)) = .9179 (VOL. CHANGE/° F) (FACTOR B)

TANK LAYOUT



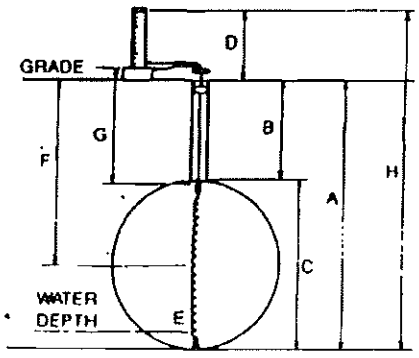
ADDITIONAL NOTES OR COMMENTS

TECHNICIAN(S): [signature] DATE: 9-28-92

DATA CHART FOR TANK SYSTEM TIGHTNESS TEST

(EZY CHEK)

Time (Military)	Reading No.	PRODUCT MONITORING ON LLR Start	End	+Gain -Loss	X Factor A	Product +Gain -Loss	TEMPERATURE COMPENSATION A Start	End	+Gain -Loss	X Factor B	Product +Gain -Loss	TEMPERATURE COMPENSATION B Start	End	+Gain -Loss	X Factor B	+Expansion -Contraction	NET VOL. CHANGE	LLR
1631	1	96	83	-13	.00166	-.0216						401	.898	-.003	9179	-.0027	.0188	
1641	2	83	73	-10	.00166	-.0166						.898	.895	-.003	9179	-.0027	.0139	
1646	3	73	63	-10	.00166	-.0166						.895	.891	-.004	9179	-.0036	.0130	
1651	4	63	53	-10	.00166	-.0166						891	.887	-.004	9179	-.0036	.0130	
1656	5	53	45	-8	.00166	-.0132						.887	.884	-.003	9179	-.0027	.0105	
1701	6	45	38	-7	.00166	-.0116						.884	.880	-.004	9179	-.0036	.0080	
1706	7	38	30	-8	.00166	-.0132						.880	.876	-.004	9179	-.0036	.0096	
1711	8	30	23	-7	.00166	-.0116						.876	.872	-.004	9179	-.0036	.0080	
1716	9	23	15	-8	.00166	-.0132						.872	.868	-.004	9179	-.0036	.0096	
1721	10	100	91	-9	.00166	-.0149						.868	.864	-.004	9179	-.0036	.0113	
1726	11	91	83	-8	.00166	-.0132						.864	.860	-.004	9179	-.0036	.0096	
1731	12	83	76	-7	.00166	-.0116						.860	.856	-.004	9179	-.0036	.0130	
1736	13	76	71	-5	.00166	-.0083						.856	.853	-.003	9179	-.0027	.0056	
1741	14	71	64	-7	.00166	-.0116						.853	.849	-.004	9179	-.0036	.0130	
1746	15	64	58	-6	.00166	-.0099						.849	.845	-.004	9179	-.0036	.0063	
1751	16	58	54	-4	.00166	-.0066						.845	.841	-.004	9179	-.0036	.0030	
1756	17	54	50	-4	.00166	-.0066						.841	.838	-.003	9179	-.0027	.0039	
1801	18	50	49	-1	.00166	-.0017						.838	.835	-.003	9179	-.0027	+.0011	
1806	19	49	49	0	.00166	0						.835	.831	-.004	9179	-.0036	+.0036	
1811	20	49	46	-3	.00166	-.0049						.831	.827	-.004	9179	-.0036	.0013	
1816	21	46	40	-6	.00166	-.0099						.827	.823	-.004	9179	-.0036	-.0063	
1821	22	40	40	0	.00166	0						.823	.819	-.004	9179	-.0036	+.0036	
1826	23	40	40	0	.00166	0						.819	.816	-.003	9179	-.0027	+.0027	.0414
1831	24	40	40	0	.00166	0						.816	.813	-.003	9179	-.0027	+.0027	.0257
1836	25	40	40	0	.00166	0						.813	.810	-.003	9179	-.0027	+.0027	.0174



A. Tank Bot. to Grade 84"
B. Tank Top to Grade. 25"
C. Tank Diameter 64"
D. Test Level above grade 45"
E. Depth of water in tank 0"
F. Depth for taking sample 57"
G. Temp. Probe depth (connector) 25"
H. Test level to Tank Bot. 134"
I. Groundwater above tank bottom 0"
J. Product Pressure per 1" height .031 PSI

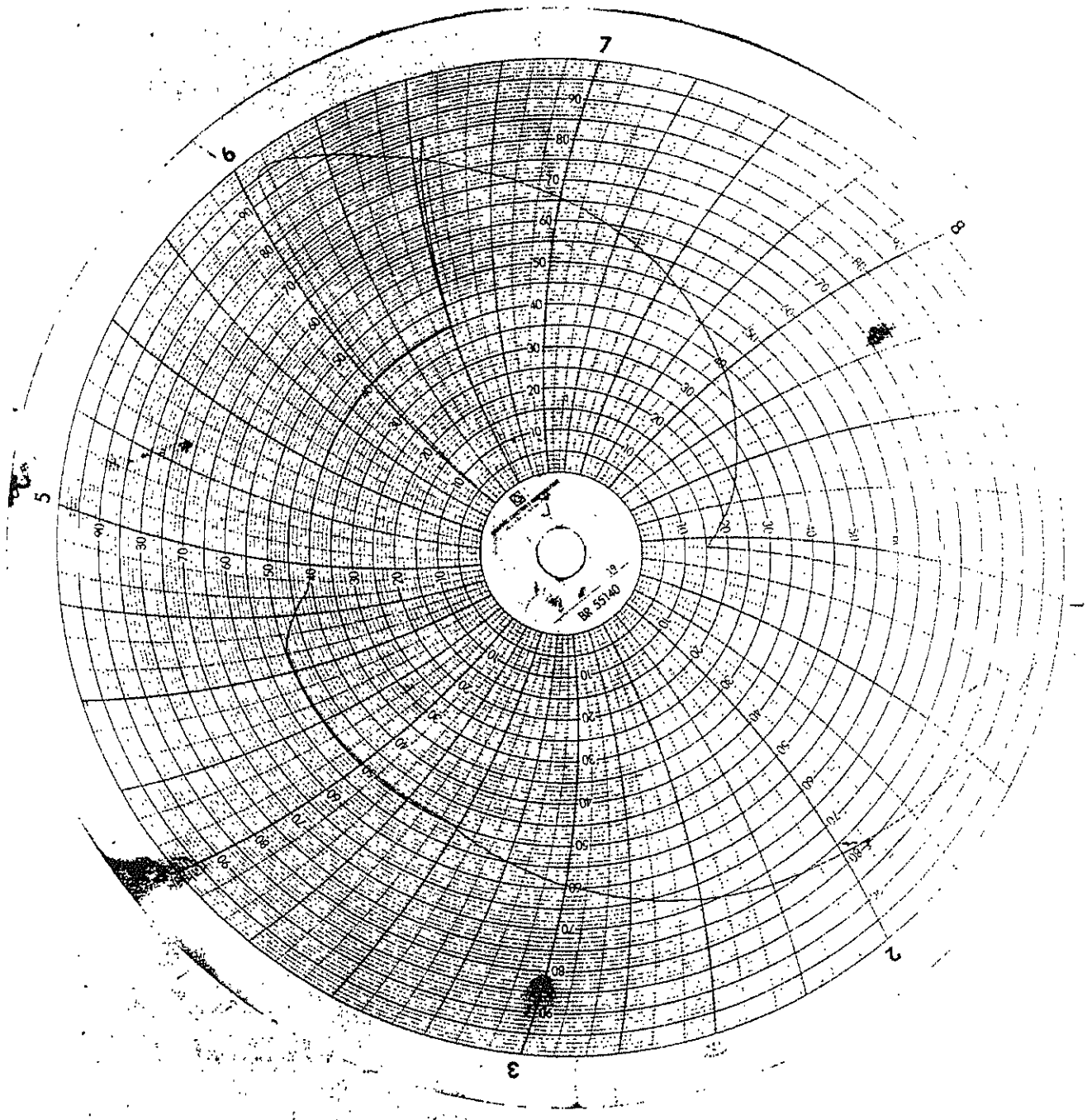
Test Pressure Formula

____ (H) × ____ (J) − (____ (I) × .036) = ____ NET TEST PRESSURE

Send Report to:
Client Gordon
Address 1801 Falmouth
City, State New Hyde Park
Phone ( )
Attn:

CERTIFICATION This is to certify that this tank system was tested on date shown. Those indicated "Tight" meet the criteria established by the National Fire Protection Association Pamphlet 329

Tank No.
Tight Yes
Leakage Indicated .0[illegible]
Technician [illegible]
Date Tested [illegible]


BR 55140

Seaboard Estates, Inc.

ONE JERICHO TURNPIKE
NEW HYDE PARK, L.I., N.Y. 11040

516 FLoral Park 4-4300
212 Fieldstone 7-2525

October 8,1992

Mr. Oeckler
Bureau of Land Resources Management
Nassau County Department of Health
240 Old Country Road
Mineola, New York 11501-4250

Re: Facility ID 1006

Dear Mr.Oeckler:

Seaboard Estates,Inc. hereby requests that you allow us to abandon a 3000 gallon oil tank located at 1801 Falmouth Avenue,New Hyde Park.

The tank we propose to abandon is located next to the foundation. To remove this tank could cause severe structural damage to the building. A tightness test was performed on 9/29/92 by A.N.S. and passed. You should be receiving the results shortly.

Thank you for your consideration. Please let us know if we can answer any questions for you.

Very truly yours,

SEABOARD ESTATES,INC.

Laurence P. Gordon,V.P.

LPG:EB

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent : Zoe Chemical
Address: 1901 Edmonds Ave New Hyde Park

Inspector

DATE	COMMENTS
7/27/78	Joint inspection with Messer Mangino & Shuster revealed plant in full operation. Spoke with plant foreman D. Battista who claimed that high water level caused pools to overflow. Conversation with Mr. Battista revealed that pools used for mixing various products washed out and liquid deposited in cesspools. Advised that since plant located in sewered area, system should be hooked into public sewer. Advised that I spoke to V.P. Niel Axelrod since plant had problem with connection to sewers in past. Mr. Axelrod not available this day.
7/28/78	Spoke to Mr. Neil Axelrod and advised him of problem associated with cesspools. He claimed he would contact sewer district for further information. I advised that we would inspect pools on 8/3/78.
8/2/78	Received letter from Zoe. Re: Sewer hookup see attached. Will refer complaint to Industrial SPDES section for further action.
8/3/78	Sample of pools taken by G. Mavelos. He claimed pools were full to capacity and contact Co.
8/4/78	Received call from Mr. Axelrod advising that Fogler had advised that pools were full. He claimed that he has been

EH 109a 1/68
DH-1198, 9/71

ENVIRONMENTAL
HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent : Zax Chemical

Address: 1801 Edwards Ave. New Hyde Park.

Inspector

DATE	COMMENTS
	advised by sewer district that he is already hooked to sewer and that connection was opened. He stated that pools were no longer been utilized. I advised that pools be pumped and filled in. List of scavengers will be sent. W.P. re-in 8/18/78

EH 109a 1/68
DH-1198. 9/71

Neil Axelrod Asst U.P.

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent: ZOË Chemical Co. Inc.
Address: 1801 Falmouth Avenue N. Hempstead NY 11040

Inspector: (HW)

DATE | COMMENTS

4 October 1982

Visited Zoë Chemical owned Facility with Neil Axelrod - Asst. U.P.

They have (2) 500 Gal. above-ground STORAGE tanks for 1,1,1 Trichloroethane and also have above ground tanks for other organics (storage).

Plant was last surveyed in Feb. 1980.

According to Mr. Axelrod Asst. U.P. he will submit an updated chemical inventory list in several days to the writer.

Mr. Axelrod will also supply additional information showing building permit connections and vents. that records submitted in 1978 investigation conducted by Messrs. Schachter & Margolin, have been cleared & filled.

Zoë Chemical have two other Ancillary bldgs. to his question @

1811 Gilford Avenue. NHP

1835 Gilford Avenue NHP.

Did not have time to view these facilities at this time -.

Hubert W. Hall

EH 109a 1/68
DH-1198, 9/71

Neil AxelRod Asst V.P.

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent: ZOË Chemical Co. Inc.
Address: 1801 Falmouth Avenue N.H.P. NY. 11040
Inspector: (initials)

DATE	COMMENTS
4 October 1982	
	Visited Zoë Chemical toured facility with Neil Axelrod - Asst. V.P.
	They have (2) 500 Gal. above ground storage tanks for 1,1,1 trichloroethane and also the above ground tanks for other solvents (storage).
	Plant was last surveyed in Feb. 1980.
	According to Mr. Axelrod Asst. V.P. he will submit an updated chemical information list in several days to the writer.
	Mr. Axelrod will also supply additional information showing building sewer connections and verify that cesspools sampled in 1978 investigation, conducted by Messrs. Schechter & Marquis, have been cleaned & filled.
	Zoë Chemical have two other ancillary bldgs. to his operation @
	1811 Gilford Avenue. NHP
	1835 Gilford Avenue NHP.
	Did not have time to tour those facilities at this time -.
	(signature)

EH 109a 1/68
DH-1198, 9/71

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent : Fire Hydrant Incident
Address: 1801 Falmouth Ave, NHP

Inspector

DATE	COMMENTS
	On Sunday April 5, 1987 I received at home a 1:30 pm call from the weekend duty sanitarian (John Ochwat) concerning a call he received from Fire Comm. I was told a spill of greenish liquid occurred at Bee Chemical, Falmouth Ave, New Hyde Park.
	I arrived at the scene at 2 pm and was meet by the following people.
	Karl Bumeisters, NHP Fire dept, Deputy Chief
	Carey Welt, Fire Marshall Office, Inspector
	Donald Lorice, Jamaica Water Supply, supervisor shield #47
	Robert Sierack, " " " , acting supervisor
	Vincent Stendardo, " " " , treatment men
	John Mierzejewski, " " " , " "
	in account of the earlier events was given. At 12 noon, NHP Fire dept on a pratice drill connected their hose to the fire hydrant and opened it and noticed a "gasoline" type smell. The deputy chief there called the Fire Marshall's office and Jamaica Water Supply Co. The material trapped in the hose was emptied into several 1 gallon plastic pails provided by Jamaica Water. Mr. Welt took a reading with an explosimeter and the material was shown to have a 10% LEL. Mr. Welt

EH 109a 1/68
DH-1198, 9/71

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent :

Address:

Inspector

DATE

COMMENTS

also collected several samples. The water company flushed the fire hydrant with water and added HTH to the line.

The Fire hydrant is located east of the entrance to Bay Chemical, 1801 Falmouth Ave., NHP. When I arrived the concentrated contaminated material was collected in 5-1 gallon pails and the street was filled with blow off water from the fire hydrant. The water was leaned to prevent it from entering a storm drain at the end of the street.

The material in the pails had a greenish color to it and large dark "spots" floated on top. The sample collected by Mr Welt was observed to have a thick layer of dark material floating on top and the smell when opened smelled like xylene type product.

I instructed Jamaica Water personnel that the water be collected in drums and be disposed of through an industrial transporter. A list of transporters was provided earlier to the water co by Mr. Welt.

EH 109a 1/68
DH-1198. 9/71

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent :
Address:

Inspector

DATE

COMMENTS

Mr. Bonce informed me that his people will do the work and that the transporter they use for their waste oil will do the disposing & requested a copy of the waste manifest to be mailed to this office upon disposing the water and waste material.

The work was done by using a portable generator and submersible pump. The concentrated material in the pails was poured into a 55 gal drum along with the water from the puddle. The work accumulated a total of 5-55 gal drums. The water co. personnel was told that the water used to rinse the plastic pails was considered contaminated and to be disposed along with the water collected from the puddle.

The cause of the incident is unknown at this time. Several suggestions were made to locate source:

1) check backflow preventors
2) look for cross connections
3) check underground gasoline tanks in the area.
4) check for spills

Location of the fire hydrant and nearby industries is on the next page.

Laura S. Lutkin

EH 109a 1/68
DH-1198. 9/71

INDUSTRIAL CHEMICAL SURVEY-BUREAU OF WATER POLLUTION
Nassau County Department of Health

Name of Company: Joe Chem Co. | SIC Code | Water Dist

PART II - CHEMICALS USED (include gases and oils)

INSTRUCTIONS: Complete all information for those chemicals your facility has used, stored, distributed, or otherwise disposed of since January 1, 1977. Do not include chemicals used only in analytical laboratory work.

Name of Chemical/Trade Name, Supplier and Address	Code	Avg Annual Usage	Gal	Lbs	Use of Chemical	Final Disposition of Chemical
1,1,1 trichloroethane		1500	✓		pesticides	used up
superchlorine chlorides		50/month		lbs	plasticides	used in plts
tributoxyethylphosphate						
morpholines		3500	✓		wax coating emulsification	used up
triethanol					shaving creams	"
steric acids						
nonionic emulsifiers surfactacants		2000	✓		pesticides	"

RECOMMENDED ACTION

FOR OFFICE USE ONLY

2 ☐ Immediate Abatement
3 ☐ Sample
4 ☒ SPDES Application
5 ☐ Refer To: _____
6 ☐ Re-inspection
7 ☐ No Action
9 ☐ Other (specify)

EH 651B 3/77

COUNTY OF NASSAU

Inter-Departmental Memo

To: Marvin Fleisher, N.C.H.D.

From: Maurice J. Osman

Date: March 31, 1988

Subject: ZOE CHEMICAL CO., GARDEN CITY PARK

I have enclosed for your information analytical data from samples collected in the area of Falmouth Avenue and Gould Street, Garden City Park. The sampling was prompted by a notification from our Sewer Maintenance Unit which noted and photographed a milky white water running from the rear of the building located on the southeast corner of Falmouth and Gould. The water ran from the building across their parking lot and into the street to two overflowing storm drains.

The samples collected were from the water in the street (#88-0273). The apparent source is the washdown of equipment used in manufacturing and packaging of household cleaners prepared by the Zoe Company.

Zoe Company has requested and received approval to discharge their process wastewater to the Nassau County sewer system.

If you have any questions regarding this incident, please feel free to contact Carl Gennaro or myself at 781-4202.

Maurice J. Osman
Chief Chemist

MJO/sm
enc.

cc: Alfons Farina
Thomas Walsh
Arthur Merget

LABORATORY REPORT OF WATER ANALYSES FOR INORGANICS
CEDAR CREEK SPECIAL PROJECTS LABORATORY-ELAP#
NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS

SAMPLE LOCATION Zoe Chemical NATURE OF SAMPLE Street

DATE SAMPLED 3-11-88 TIME SAMPLED 10^50 am SAMPLED BY JM

DATE RECEIVED 3-11-88 TIME RECEIVED 2^30 pm SAMPLE NO. 88-0274

METAL ANALYSIS mg/l

ALUMINUM		✓pH	6.4
ANTIMONY		✓COD	2,473 mg/l
CADMIUM		BOD	mg/l
CHROMIUM		DISSOLVED OXYGEN	mg/l
HEXAVALENT CHROMIUM		OIL/GREASE	mg/l
COPPER		CYANIDE	mg/l
IRON		FLUORIDE	mg/l
LEAD		CHLORINE RESIDUAL	mg/l
MANGANESE		CHLORIDES	mg/l
MERCURY		AMMONIA-NITROGEN	mg/l
NICKEL		NITRITES-N	mg/l
SILVER		NITRATES-N	mg/l
TIN		HYDROGEN SULFIDE	mg/l
ZINC		SULFATES	mg/l
		O-PHOSPHATES	mg/l
		ALKALINITY	mg/l
		SUSPENDED SOLIDS	mg/l
		DISSOLVED SOLIDS	mg/l
COMMENTS		VOLATILE SOLIDS	mg/l
		TOTAL SOLIDS	mg/l
		TURBIDITY	NTU
		SPECIFIC CONDUCTIVITY	umhos/cm
		ORGANICS	BTX, V HH

Nickel Co.

LABORATORY REPORT OF WATER ANALYSES FOR INORGANICS
CEDAR CREEK SPECIAL PROJECTS LABORATORY-ELAP#
NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS

SAMPLE LOCATION ZOE Chem. NEW NATURE OF SAMPLE ~~S~~. ? Driveway

DATE SAMPLED 3-11-88 TIME SAMPLED 10 50 am SAMPLED BY J.M

DATE RECEIVED 3-11-88 TIME RECEIVED 2 30 pm SAMPLE NO. [illegible] 0278

METAL ANALYSIS mg/l

ALUMINUM		pH	9.3
ANTIMONY		COD	16,155 mg/l
CADMIUM		BOD	mg/l
CHROMIUM		DISSOLVED OXYGEN	mg/l
HEXAVALENT CHROMIUM		OIL/GREASE	mg/l
COPPER		CYANIDE	mg/l
IRON		FLUORIDE	mg/l
LEAD		CHLORINE RESIDUAL	mg/l
MANGANESE		CHLORIDES	mg/l
MERCURY		AMMONIA-NITROGEN	mg/l
NICKEL		NITRITES-N	mg/l
SILVER		NITRATES-N	mg/l
TIN		HYDROGEN SULFIDE	mg/l
ZINC		SULFATES	mg/l
		O-PHOSPHATES	mg/l
		ALKALINITY	mg/l
		SUSPENDED SOLIDS	mg/l
		DISSOLVED SOLIDS	mg/l
		VOLATILE SOLIDS	mg/l
		TOTAL SOLIDS	mg/l
		TURBIDITY	NTU
		SPECIFIC CONDUCTIVITY	umhos/cm
		ORGANICS	BTX V H H alcohols

COMMENTS the only alcohols that can be run are EtOH, Isopropal, N-propal, butanol & methanol (qualitatively)

5.1 88

LABORATORY REPORT OF WATER ANALYSES FOR VOLATILE HALOCARBONS

CEDAR CREEK LAB

NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS

SAMPLE LOCATION Zoe Chemical

SAMPLE TYPE industrial waste

DATE & TIME SAMPLED 3/11/88 (10:50AM)

NAME OF COLLECTOR CG/LW

DATE & TIME RECEIVED 3/14/88 (2:30Pm)

ANALYSIS PERFORMED 3/14/88

ELAP CERTIFICATION NO. 10862

SAMPLE # 88-0150, 88-0151

COMPOUND (ug/1)	#880273	#880274
1. Chloroethylene (Vinyl Chloride)	NA	NA
2. Trichlorofluoromethane (Freon II)	BDL	0.3
3. 1,1-Dichloroethene	BDL	BDL
4. Dichloromethane (Methylene Chloride)	0.6	0.1
5. 1,2-t-Dichloroethene	BDL	BDL
6. 1,1-Dichloroethane	BDL	0.6
7. 1,2-c-Dichloroethene	NA	NA
8. Trichloromethane (Chloroform)	BDL	BDL
9. 1,1,1-Trichloroethane	1.8	72.5
10. Tetrachloromethane (CC14)	BDL	BDL
11. 1,2-Dichloroethane	BDL	BDL
12. Trichloroethene	BDL	0.6
13. Bromodichloromethane	BDL	BDL
14. Tetrachloroethene	0.2	0.7
15. Dibromochloromethane	BDL	BDL
16. Chlorobenzene	BDL	BDL
17. Tribromomethane (Bromoform)	BDL	BDL

#880273 Discharge

#880274 STREET

REMARKS:

LABORATORY REPORT OF WATER ANALYSES FOR VOLATILE AROMATICS

CEDAR CREEK LAB

NASSAU COUNTY DEPARTMENTY OF PUBLIC WORKS

SAMPLE LOCATION Zoe Chemical , SAMPLE TYPE industrial waste

DATE & TIME SAMPLED 3/11/88 (10:50 Am) NAME OF COLLECTOR CG/LW

DATE & TIME RECEIVED 3/14/88 (2:30 Pm) ANALYSIS PERFORMED 3/14/88

ELAP CERTIFICATION NO. 10868 SAMPLE # 88-0150, 88-0151

COMPOUND (ug/1)	# 880273	# 880274				
1. Benzene	1.5	1.7				
2. Toluene	8.6	2.7				
3. Ethylbenzene	8.5	3.2				
4. 1,4-Xylene (p-Xylene)	17.7	4.8				
5. 1,3-Xylene (m-Xylene)						
6. 1,2-Xylene (O-Xylene)	9.9	2.8				
7. 1,3-Dichlorobenzene (M)	2.0	BDL				
8. 1,4-Dichlorobenzene (P)	833.	107.				
9. 1,2-Dichlorobenzene (O)	96.5	10.9				

REMARKS:

LABORATORY REPORT OF WATER ANALYSES FOR VOLATILE AROMATICS

CEDAR CREEK LAB

NASSAU COUNTY DEPARTMENTY OF PUBLIC WORKS

SAMPLE LOCATION Zoe Chemical , SAMPLE TYPE industrial wastewater

DATE & TIME SAMPLED 3/11/88 (10:50Am) NAME OF COLLECTOR CG/IW

DATE & TIME RECEIVED 3/14/88 (2:30Pm) , ANALYSIS PERFORMED 3/25/88

ELAP CERTIFICATION NO. 10862 , SAMPLE # 88-0150, 88-0151

COMPOUND (ug/1)	88-0273	88-0274				
1. Benzene						
2. Toluene						
3. Ethylbenzene						
4. 1,4-Xylene (p-Xylene)						
5. 1,3-Xylene (m-Xylene)						
6. 1,2-Xylene (O-Xylene)						
7. 1,3-Dichlorobenzene (M)						
8. 1,4-Dichlorobenzene (P)						
9. 1,2-Dichlorobenzene (O)						

REMARKS:

acetone	<10ppm	≈10ppm
2-propanol	100ppm	<10ppm

INVESTIGATION SUMMARY

Bureau of Water Pollution Control

Nassau County Dept. of Health

Date Opened: 10/6/77

Received by: [X] Phone [ ] Mail [ ] Walk-In [ ] Survey

Reason for Investigation: [X] Complaint [ ] Survey [ ] Permit [ ] Other

Reinsp. Dates: 1. 2. 3.

Location of Complaint: Address; City or Town; Census Tract

Notified of Confidentiality: [ ] Yes [ ] No

Investigation: [ ] Prev.Closed [ ] New [ ] In Proc.

Date Closed

COMPLAINANT		(owner)	
Name: ANONYMOUS		Name: ZOE CHEMICAL CO.	
Address	Apt.#	Address: THOMAS AVE	Apt.#
City or Town	Tel.	City or Town: NEW HYDE PARK	Tel.: 354 1043

NATURE OF COMPLAINT

- [ ] Oil Spill
- [ ] Discoloration
- [ ] Odor
- [ ] Jelly Fish
- [ ] Industrial Waste
- [ ] Dead Fish, Birds, Ducks
- [ ] Garbage
- [ ] Sewage
- [ ] Scum
- [ ] Other (specify)

Specify (Where Necessary)

DUMPING STORM DRAIN INTO RECHARGE BASIN (BY PARKING LOT)

(WHITE CHEMICAL)

INSPECTION REPORT

Violation: [ ] Yes [ ] No

Violation Notice Issued? [ ] Yes [ ] No Date

Violation: [ ] N.C.Pub.Health Law [ ] N.Y.S.Sanitary Code [ ] N.Y.S.DEC. Law

Dye Test Performed? [ ] Yes [ ] No

Results: [ ] Pos. [ ] Neg.

Sample Taken: [ ] Yes [ ] No

Total

Lab.#

Date Viol.Corrected:

Total Complaints Resolved:

Case Solution: [ ] Oper.Discont. [ ] New System [ ] System Repaired [ ] No Action

Referred to:

Date

Date	COMMENTS AND ACTION TAKEN	Sign.
	Spill originates in parking lot at front of plant. The chemical flowed down the street (Falmouth Ave, New Hyde Park) to the sewer drain at the corner of Gould & Falmouth Ave. It appears to be accidental, but this is my opinion. The fluid is milky white.	DAW WBG
	10/7/77 Zoe Chem Falmouth Ave New Hyde Park	

Complainant Notified by: [ ] Letter [X] Phone [ ] Visit

Approved by:

Date

EI 615 6/76

1,1,1 Trichloroethane	1500 g	Used in Product
Methylene Chloride tributylethylphosphate	600 g	Used in Product - "plasticides"
morpholines	3500 g	Wax M/S
non ionic surfactants	.2000 g	in product

Make Household products - ie Aerosols

Do have a pump.

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1.
2.
3.

Location of Complaint
Address
City or Town
Census Tract

Notified of Confidentiality [ ] Yes [ ] No

Investigation [ ] Prev.Closed [ ] New [ ] In Proc.

Date Closed

COMPLAINANT

Name C. Gumlan

Address Bureau of Air Resources

City or Town STEVE KRAMER Suffolk County D.E.C. 234-2662

Apt.# Tel.

(owner)

Name ZOE Chemical

Address 1801 Falmouth Ave

City or Town New Hyde Park

Apt.# Tel.

NATURE OF COMPLAINT

- [ ] Oil Spill
- [ ] Discoloration
- [ ] Odor
- [ ] Jelly Fish
- [x] Industrial Waste
- [ ] Dead Fish, Birds, Ducks
- [ ] Garbage
- [ ] Sewage
- [ ] Scum
- [ ] Other (specify)

Specify (Where Necessary)

DON BATTISTA
Plant Mgr.

INSPECTION REPORT

Violation [ ] Yes [ ] No

Violation Notice Issued? [ ] Yes [ ] No Date

Violation
- [ ] N.C.Pub.Health Law
- [ ] N.Y.S.Sanitary Code
- [ ] N.Y.S.DEC. Law

Dye Test Performed? [ ] Yes [ ] No

Results [ ] Pos. [ ] Neg.

Sample Taken [ ] Yes [ ] No

Total

Lab.#

Date Viol.Corrected:

Total Complaints Resolved:

Case Solution:
- [ ] Oper.Discont.
- [ ] New System
- [ ] System Repaired
- [ ] No Action

Referred to:

Date

Date	COMMENTS AND ACTION TAKEN	Sign.
07/24/78	Zoe Chemical has a industrial waste discharge into a cesspool[?]. This cesspool shows evidence of having overflowed at some time. Their sanitary waste is connected to the sewer. I spoke to Marvin about this and he suggests that you notify Zoe that he must connect to the sewer even if pre-treatment is required. The nature of his industrial discharge is unknown. T. Focazio	

Complainant Notified by: [ ] Letter [x] Phone [ ] Visit

Approved by:

Date

EH 613 6/76

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent : ZOE CHEMICAL Co.
Address: 1801 FALMOUTH AVE. N. Hyde Park

Inspector

DATE	COMMENTS
7/27/78	On 7/27/78 M. MANGINO & J. Schechter, of This office met with Don BATTISTA, plant foreman of Zoe Chemical Co. The inspection of The company revealed industrial wastes being discharged to cesspools located along Falmouth Ave. These wastes include products used in The manufacture of aerosol spray cans - furniture polish, starch, ~~CHRISTMAS~~ SNOW etc. (Mr. Battista stated an insecticide was also packaged at The plant, but is no longer being done.) The discharge of wastes occurs each time a new product is to be packaged in aerosol cans. At That Time, The stainless steel vats are washed out To clean Them of The previous runs residue. Mr. Battista was told That The plant was in violation in That The discharge represented a contravention of groundwater standards. He was told That he would have to connect to The sewer. Mr. Battista stated that The company had previously been connected to The public sewerage system However, plant waste had fouled the pumping stations contacts. DPW had requested The plant To discontinue discharges that caused The problem. Mr. Battista was told To have The owner,

EH 109a 1/68
DH-1198, 9/71

ENVIRONMENTAL HEALTH
Continuation Sheet
Nassau County Health Department

Owner or Agent :

Address:

Inspector

DATE	COMMENTS
	N. Axerod, contact this office concerning the violation of groundwater standards & the necessity of ~~discontinuing~~ discontinuing the effluent discharge to the cesspools.
	J. Schechter

EH 109a 1/68
DH-1198. 9/71

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I

LOW STRESS (low flow) PURGING AND SAMPLING PROCEDURE FOR THE COLLECTION OF GROUNDWATER SAMPLES FROM MONITORING WELLS

Quality Assurance Unit
U.S. Environmental Protection Agency – Region 1
11 Technology Drive
North Chelmsford, MA 01863

Prepared by: Charles Porfert 1/19/10
(Charles Porfert, Quality Assurance Unit) Date

Approved by: Gerard Sotolongo 1-19-10
(Gerard Sotolongo, Quality Assurance Unit) Date

Revision Page

Date	Rev #	Summary of changes	Sections
7/30/96	2	Finalized	
01/19/10	3	Updated	All sections

TABLE OF CONTENTS

USE OF TERMS

Equipment blank: The equipment blank shall include the pump and the pump's tubing. If tubing is dedicated to the well, the equipment blank needs only to include the pump in subsequent sampling rounds. If the pump and tubing are dedicated to the well, the equipment blank is collected prior to its placement in the well. If the pump and tubing will be used to sample multiple wells, the equipment blank is normally collected after sampling from contaminated wells and not after background wells.

Field duplicates: Field duplicates are collected to determine precision of the sampling procedure. For this procedure, collect duplicate for each analyte group in consecutive order (VOC original, VOC duplicate, SVOC original, SVOC duplicate, etc.).

Indicator field parameters: This SOP uses field measurements of turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential (ORP) as indicators of when purging operations are sufficient and sample collection may begin.

Matrix Spike/Matrix Spike Duplicates: Used by the laboratory in its quality assurance program. Consult the laboratory for the sample volume to be collected.

Poteniometric Surface: The level to which water rises in a tightly cased well constructed in a confined aquifer. In an unconfined aquifer, the potentiometric surface is the water table.

QAPP: Quality Assurance Project Plan

SAP: Sampling and Analysis Plan

SOP: Standard operating procedure

Stabilization: A condition that is achieved when all indicator field parameter measurements are sufficiently stable (as described in the "Monitoring Indicator Field Parameters" section) to allow sample collection to begin.

Temperature blank: A temperature blank is added to each sample cooler. The blank is measured upon receipt at the laboratory to assess whether the samples were properly cooled during transit.

Trip blank (VOCs): Trip blank is a sample of analyte-free water taken to the sampling site and returned to the laboratory. The trip blanks (one pair) are added to each sample cooler that contains VOC samples.

SCOPE & APPLICATION

The goal of this groundwater sampling procedure is to collect water samples that reflect the total mobile organic and inorganic loads (dissolved and colloidal sized fractions) transported through the subsurface under ambient flow conditions, with minimal physical and chemical alterations from sampling operations. This standard operating procedure (SOP) for collecting groundwater samples will help ensure that the project's data quality objectives (DQOs) are met under certain low-flow conditions.

The SOP emphasizes the need to minimize hydraulic stress at the well-aquifer interface by maintaining low water-level drawdowns, and by using low pumping rates during purging and sampling operations. Indicator field parameters (e.g., dissolved oxygen, pH, etc.) are monitored during purging in order to determine when sample collection may begin. Samples properly collected using this SOP are suitable for analysis of groundwater contaminants (volatile and semi-volatile organic analytes, dissolved gases, pesticides, PCBs, metals and other inorganics), or naturally occurring analytes. This SOP is based on Puls, and Barcelona (1996).

This procedure is designed for monitoring wells with an inside diameter (1.5-inches or greater) that can accommodate a positive lift pump with a screen length or open interval ten feet or less and with a water level above the top of the screen or open interval (Hereafter, the "screen or open interval" will be referred to only as "screen interval"). This SOP is not applicable to other well-sampling conditions.

While the use of dedicated sampling equipment is not mandatory, dedicated pumps and tubing can reduce sampling costs significantly by streamlining sampling activities and thereby reducing the overall field costs.

The goal of this procedure is to emphasize the need for consistency in deploying and operating equipment while purging and sampling monitoring wells during each sampling event. This will help to minimize sampling variability.

This procedure describes a general framework for groundwater sampling. Other site specific information (hydrogeological context, conceptual site model (CSM), DQOs, etc.) coupled with systematic planning must be added to the procedure in order to develop an appropriate site specific SAP/QAPP. In addition, the site specific SAP/QAPP must identify the specific equipment that will be used to collect the groundwater samples.

This procedure does not address the collection of water or free product samples from wells containing free phase LNAPLs and/or DNAPLs (light or dense non-aqueous phase

liquids). For this type of situation, the reader may wish to check: Cohen, and Mercer (1993) or other pertinent documents.

This SOP is to be used when collecting groundwater samples from monitoring wells at all Superfund, Federal Facility and RCRA sites in Region 1 under the conditions described herein. Request for modification of this SOP, in order to better address specific situations at individual wells, must include adequate technical justification for proposed changes. All changes and modifications must be approved and included in a revised SAP/QAPP before implementation in field.

BACKGROUND FOR IMPLEMENTATION

It is expected that the monitoring well screen has been properly located (both laterally and vertically) to intercept existing contaminant plume(s) or along flow paths of potential contaminant migration. Problems with inappropriate monitoring well placement or faulty/improper well installation cannot be overcome by even the best water sampling procedures. This SOP presumes that the analytes of interest are moving (or will potentially move) primarily through the more permeable zones intercepted by the screen interval.

Proper well construction, development, and operation and maintenance cannot be overemphasized. The use of installation techniques that are appropriate to the hydrogeologic setting of the site often prevent "problem well" situations from occurring. During well development, or redevelopment, tests should be conducted to determine the hydraulic characteristics of the monitoring well. The data can then be used to set the purging/sampling rate, and provide a baseline for evaluating changes in well performance and the potential need for well rehabilitation. Note: if this installation data or well history (construction and sampling) is not available or discoverable, for all wells to be sampled, efforts to build a sampling history should commence with the next sampling event.

The pump intake should be located within the screen interval and at a depth that will remain under water at all times. It is recommended that the intake depth and pumping rate remain the same for all sampling events. The mid-point or the lowest historical midpoint of the saturated screen length is often used as the location of the pump intake. For new wells, or for wells without pump intake depth information, the site's SAP/QAPP must provide clear reasons and instructions on how the pump intake depth(s) will be selected, and reason(s) for the depth(s) selected. If the depths to top and bottom of the well screen are not known, the SAP/QAPP will need to describe how the sampling depth will be determined and how the data can be used.

Stabilization of indicator field parameters is used to indicate that conditions are suitable for sampling to begin. Achievement of turbidity levels of less than 5 NTU, and stable drawdowns of less than 0.3 feet, while desirable, are not mandatory. Sample collection

may still take place provided the indicator field parameter criteria in this procedure are met. If after 2 hours of purging indicator field parameters have not stabilized, one of three optional courses of action may be taken: a) continue purging until stabilization is achieved, b) discontinue purging, do not collect any samples, and record in log book that stabilization could not be achieved (documentation must describe attempts to achieve stabilization), c) discontinue purging, collect samples and provide full explanation of attempts to achieve stabilization (note: there is a risk that the analytical data obtained, especially metals and strongly hydrophobic organic analytes, may reflect a sampling bias and therefore, the data may not meet the data quality objectives of the sampling event).

It is recommended that low-flow sampling be conducted when the air temperature is above 32°F (0°C). If the procedure is used below 32°F, special precautions will need to be taken to prevent the groundwater from freezing in the equipment. Because sampling during freezing temperatures may adversely impact the data quality objectives, the need for water sample collection during months when these conditions are likely to occur should be evaluated during site planning and special sampling measures may need to be developed. Ice formation in the flow-through-cell will cause the monitoring probes to act erratically. A transparent flow-through-cell needs to be used to observe if ice is forming in the cell. If ice starts to form on the other pieces of the sampling equipment, additional problems may occur.

HEALTH & SAFETY

When working on-site, comply with all applicable OSHA requirements and the site's health/safety procedures. All proper personal protection clothing and equipment are to be worn. Some samples may contain biological and chemical hazards. These samples should be handled with suitable protection to skin, eyes, etc.

CAUTIONS

The following cautions need to be considered when planning to collect groundwater samples when the below conditions occur.

If the groundwater degasses during purging of the monitoring well, dissolved gases and VOCs will be lost. When this happens, the groundwater data for dissolved gases (e.g., methane, ethene, ethane, dissolved oxygen, etc.) and VOCs will need to be qualified. Some conditions that can promote degassing are the use of a vacuum pump (e.g., peristaltic pumps), changes in aperture along the sampling tubing, and squeezing/pinching the pump's tubing which results in a pressure change.

When collecting the samples for dissolved gases and VOCs analyses, avoid aerating the groundwater in the pump's tubing. This can cause loss of the dissolved gases and VOCs in

the groundwater. Having the pump's tubing completely filled prior to sampling will avoid this problem when using a centrifugal pump or peristaltic pump.

Direct sun light and hot ambient air temperatures may cause the groundwater in the tubing and flow-through-cell to heat up. This may cause the groundwater to degas which will result in loss of VOCs and dissolved gases. When sampling under these conditions, the sampler will need to shade the equipment from the sunlight (e.g., umbrella, tent, etc.). If possible, sampling on hot days, or during the hottest time of the day, should be avoided. The tubing exiting the monitoring well should be kept as short as possible to avoid the sun light or ambient air from heating up the groundwater.

Thermal currents in the monitoring well may cause vertical mixing of water in the well bore. When the air temperature is colder than the groundwater temperature, it can cool the top of the water column. Colder water which is denser than warm water sinks to the bottom of the well and the warmer water at the bottom of the well rises, setting up a convention cell. "During low-flow sampling, the pumped water may be a mixture of convecting water from within the well casing and aquifer water moving inward through the screen. This mixing of water during low-flow sampling can substantially increase equilibration times, can cause false stabilization of indicator parameters, can give false indication of redox state, and can provide biological data that are not representative of the aquifer conditions" (Vroblesky 2007).

Failure to calibrate or perform proper maintenance on the sampling equipment and measurement instruments (e.g., dissolved oxygen meter, etc.) can result in faulty data being collected.

Interferences may result from using contaminated equipment, cleaning materials, sample containers, or uncontrolled ambient/surrounding air conditions (e.g., truck/vehicle exhaust nearby).

Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment and/or proper planning to avoid ambient air interferences. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

Clean and decontaminate all sampling equipment prior to use. All sampling equipment needs to be routinely checked to be free from contaminants and equipment blanks collected to ensure that the equipment is free of contaminants. Check the previous equipment blank data for the site (if they exist) to determine if the previous cleaning procedure removed the contaminants. If contaminants were detected and they are a concern, then a more vigorous cleaning procedure will be needed.

PERSONNEL QUALIFICATIONS

All field samplers working at sites containing hazardous waste must meet the requirements of the OSHA regulations. OSHA regulations may require the sampler to take the 40 hour OSHA health and safety training course and a refresher course prior to engaging in any field activities, depending upon the site and field conditions.

The field samplers must be trained prior to the use of the sampling equipment, field instruments, and procedures. Training is to be conducted by an experienced sampler before initiating any sampling procedure.

The entire sampling team needs to read, and be familiar with, the site Health and Safety Plan, all relevant SOPs, and SAP/QAPP (and the most recent amendments) before going onsite for the sampling event. It is recommended that the field sampling leader attest to the understanding of these site documents and that it is recorded.

EQUIPMENT AND SUPPLIES

A. Informational materials for sampling event

A copy of the current Health and Safety Plan, SAP/QAPP, monitoring well construction data, location map(s), field data from last sampling event, manuals for sampling, and the monitoring instruments' operation, maintenance, and calibration manuals should be brought to the site.

B. Well keys.

C. Extraction device

Adjustable rate, submersible pumps (e.g., centrifugal, bladder, etc.) which are constructed of stainless steel or Teflon are preferred. Note: if extraction devices constructed of other materials are to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

If bladder pumps are selected for the collection of VOCs and dissolved gases, the pump setting should be set so that one pulse will deliver a water volume that is sufficient to fill a 40 mL VOC vial. This is not mandatory, but is considered a "best practice". For the proper operation, the bladder pump will need a minimum amount of water above the pump; consult the manufacturer for the recommended submergence. The pump's recommended submergence value should be determined during the planning stage, since it may influence well construction and placement of dedicated pumps where water-level fluctuations are significant.

Adjustable rate, peristaltic pumps (suction) are to be used with caution when collecting samples for VOCs and dissolved gases (e.g., methane, carbon dioxide, etc.) analyses. Additional information on the use of peristaltic pumps can be found in Appendix A. If peristaltic pumps are used, the inside diameter of the rotor head tubing needs to match the inside diameter of the tubing installed in the monitoring well.

Inertial pumping devices (motor driven or manual) are not recommended. These devices frequently cause greater disturbance during purging and sampling, and are less easily controlled than submersible pumps (potentially increasing turbidity and sampling variability, etc.). This can lead to sampling results that are adversely affected by purging and sampling operations, and a higher degree of data variability.

D. Tubing

Teflon or Teflon-lined polyethylene tubing are preferred when sampling is to include VOCs, SVOCs, pesticides, PCBs and inorganics. Note: if tubing constructed of other materials is to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

PVC, polypropylene or polyethylene tubing may be used when collecting samples for metal and other inorganics analyses.

The use of 1/4 inch or 3/8 inch (inside diameter) tubing is recommended. This will help ensure that the tubing remains liquid filled when operating at very low pumping rates when using centrifugal and peristaltic pumps.

Silastic tubing should be used for the section around the rotor head of a peristaltic pump. It should be less than a foot in length. The inside diameter of the tubing used at the pump rotor head must be the same as the inside diameter of tubing placed in the well. A tubing connector is used to connect the pump rotor head tubing to the well tubing. Alternatively, the two pieces of tubing can be connected to each other by placing the one end of the tubing inside the end of the other tubing. The tubing must not be reused.

E. The water level measuring device

Electronic "tape", pressure transducer, water level sounder/level indicator, etc. should be capable of measuring to 0.01 foot accuracy. Recording pressure transducers, mounted above the pump, are especially helpful in tracking water levels during pumping operations, but their use must include check measurements with a water level "tape" at the start and end of each sampling event.

F. Flow measurement supplies

Graduated cylinder (size according to flow rate) and stopwatch usually will suffice.

Large graduated bucket used to record total water purged from the well.

G. Interface probe

To be used to check on the presence of free phase liquids (LNAPL, or DNAPL) before purging begins (as needed).

H. Power source (generator, nitrogen tank, battery, etc.)

When a gasoline generator is used, locate it downwind and at least 30 feet from the well so that the exhaust fumes do not contaminate samples.

I. Indicator field parameter monitoring instruments

Use of a multi-parameter instrument capable of measuring pH, oxidation/reduction potential (ORP), dissolved oxygen (DO), specific conductance, temperature, and coupled with a flow-through-cell is required when measuring all indicator field parameters, except turbidity. Turbidity is collected using a separate instrument. Record equipment/instrument identification (manufacturer, and model number).

Transparent, small volume flow-through-cells (e.g., 250 mLs or less) are preferred. This allows observation of air bubbles and sediment buildup in the cell, which can interfere with the operation of the monitoring instrument probes, to be easily detected. A small volume cell facilitates rapid turnover of water in the cell between measurements of the indicator field parameters.

It is recommended to use a flow-through-cell and monitoring probes from the same manufacturer and model to avoid incompatibility between the probes and flow-through-cell.

Turbidity samples are collected before the flow-through-cell. A "T" connector coupled with a valve is connected between the pump's tubing and flow-through-cell. When a turbidity measurement is required, the valve is opened to allow the groundwater to flow into a container. The valve is closed and the container sample is then placed in the turbidimeter.

Standards are necessary to perform field calibration of instruments. A minimum of two standards are needed to bracket the instrument measurement range for all parameters except ORP which use a Zobell solution as a standard. For dissolved oxygen, a wet sponge used for the 100% saturation and a zero dissolved oxygen solution are used for the calibration.

Barometer (used in the calibration of the Dissolved Oxygen probe) and the conversion formula to convert the barometric pressure into the units of measure used by the Dissolved Oxygen meter are needed.

J. Decontamination supplies

Includes (for example) non-phosphate detergent, distilled/deionized water, isopropyl alcohol, etc.

K. Record keeping supplies

Logbook(s), well purging forms, chain-of-custody forms, field instrument calibration forms, etc.

L. Sample bottles

M. Sample preservation supplies (as required by the analytical methods)

N. Sample tags or labels

O. PID or FID instrument

If appropriate, to detect VOCs for health and safety purposes, and provide qualitative field evaluations.

P. Miscellaneous Equipment

Equipment to keep the sampling apparatus shaded in the summer (e.g., umbrella) and from freezing in the winter. If the pump's tubing is allowed to heat up in the warm weather, the cold groundwater may degas as it is warmed in the tubing.

EQUIPMENT/INSTRUMENT CALIBRATION

Prior to the sampling event, perform maintenance checks on the equipment and instruments according to the manufacturer's manual and/or applicable SOP. This will ensure that the equipment/instruments are working properly before they are used in the field.

Prior to sampling, the monitoring instruments must be calibrated and the calibration documented. The instruments are calibrated using U.S Environmental Protection Agency Region 1 *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* January 19, 2010, or latest version or from one of the methods listed in 40CFR136, 40CFR141 and SW-846.

The instruments shall be calibrated at the beginning of each day. If the field measurement falls outside the calibration range, the instrument must be re-calibrated so that all measurements fall within the calibration range. At the end of each day, a calibration check is performed to verify that instruments remained in calibration throughout the day. This check is performed while the instrument is in measurement mode, not calibration mode. If the field instruments are being used to monitor the natural attenuation parameters, then a calibration check at mid-day is highly recommended to ensure that the instruments did not drift out of calibration. Note: during the day if the instrument reads zero or a negative number for dissolved oxygen, pH, specific conductance, or turbidity (negative value only), this indicates that the instrument drifted out of calibration or the instrument is malfunctioning. If this situation occurs the data from this instrument will need to be qualified or rejected.

PRELIMINARY SITE ACTIVITIES (as applicable)

Check the well for security (damage, evidence of tampering, missing lock, etc.) and record pertinent observations (include photograph as warranted).

If needed lay out sheet of clean polyethylene for monitoring and sampling equipment, unless equipment is elevated above the ground (e.g., on a table, etc.).

Remove well cap and if appropriate measure VOCs at the rim of the well with a PID or FID instrument and record reading in field logbook or on the well purge form.

If the well casing does not have an established reference point (usually a V-cut or indelible mark in the well casing), make one. Describe its location and record the date of the mark in the logbook (consider a photographic record as well). All water level measurements must be recorded relative to this reference point (and the altitude of this point should be determined using techniques that are appropriate to site's DQOs.

If water-table or potentiometric surface map(s) are to be constructed for the sampling event, perform synoptic water level measurement round (in the shortest possible time) before any purging and sampling activities begin. If possible, measure water level depth (to 0.01 ft.) and total well depth (to 0.1 ft.) the day before sampling begins, in order to allow for re-settlement of any particulates in the water column. This is especially important for those wells that have not been recently sampled because sediment buildup in the well may require the well to be redeveloped. If measurement of total well depth is not made the day before, it should be measured after sampling of the well is complete. All measurements must be taken from the established referenced point. Care should be taken to minimize water column disturbance.

Check newly constructed wells for the presence of LNAPLs or DNAPLs before the initial sampling round. If none are encountered, subsequent check measurements with an interface probe may not be necessary unless analytical data or field analysis signal a worsening situation. This SOP cannot be used in the presence of LNAPLs or DNAPLs. If NAPLs are present, the project team must decide upon an alternate sampling method. All project modifications must be approved and documented prior to implementation.

If available check intake depth and drawdown information from previous sampling event(s) for each well. Duplicate, to the extent practicable, the intake depth and extraction rate (use final pump dial setting information) from previous event(s). If changes are made in the intake depth or extraction rate(s) used during previous sampling event(s), for either portable or dedicated extraction devices, record new values, and explain reasons for the changes in the field logbook.

PURGING AND SAMPLING PROCEDURE

Purging and sampling wells in order of increasing chemical concentrations (known or anticipated) are preferred.

The use of dedicated pumps is recommended to minimize artificial mobilization and entrainment of particulates each time the well is sampled. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each

sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

A. Initial Water Level

Measure the water level in the well before installing the pump if a non-dedicated pump is being used. The initial water level is recorded on the purge form or in the field logbook.

B. Install Pump

Lower pump, safety cable, tubing and electrical lines slowly (to minimize disturbance) into the well to the appropriate depth (may not be the mid-point of the screen/open interval). The Sampling and Analysis Plan/Quality Assurance Project Plan should specify the sampling depth (used previously), or provide criteria for selection of intake depth for each new well. If possible keep the pump intake at least two feet above the bottom of the well, to minimize mobilization of particulates present in the bottom of the well.

Pump tubing lengths, above the top of well casing should be kept as short as possible to minimize heating the groundwater in the tubing by exposure to sun light and ambient air temperatures. Heating may cause the groundwater to degas, which is unacceptable for the collection of samples for VOC and dissolved gases analyses.

C. Measure Water Level

Before starting pump, measure water level. Install recording pressure transducer, if used to track drawdowns, to initialize starting condition.

D. Purge Well

From the time the pump starts purging and until the time the samples are collected, the purged water is discharged into a graduated bucket to determine the total volume of groundwater purged. This information is recorded on the purge form or in the field logbook.

Start the pump at low speed and slowly increase the speed until discharge occurs. Check water level. Check equipment for water leaks and if present fix or replace the affected equipment. Try to match pumping rate used during previous sampling event(s). Otherwise, adjust pump speed until there is little or no water level drawdown. If the minimal drawdown that can be achieved exceeds 0.3 feet, but remains stable, continue purging.

Monitor and record the water level and pumping rate every five minutes (or as appropriate) during purging. Record any pumping rate adjustments (both time and flow rate). Pumping rates should, as needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. Adjustments are best made in the first fifteen minutes of pumping in order to help minimize purging time. During pump start-up, drawdown may exceed the 0.3 feet target and then "recover" somewhat as pump flow adjustments are made. Purge volume calculations should utilize stabilized drawdown value, not the initial drawdown. If the initial water level is above the top of the screen do not allow the water level to fall into the well screen. The final purge volume must be greater than the stabilized drawdown volume plus the pump's tubing volume. If the drawdown has exceeded 0.3 feet and stabilizes, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.

Avoid the use of constriction devices on the tubing to decrease the flow rate because the constrictor will cause a pressure difference in the water column. This will cause the groundwater to degas and result in a loss of VOCs and dissolved gasses in the groundwater samples.

Note: the flow rate used to achieve a stable pumping level should remain constant while monitoring the indicator parameters for stabilization and while collecting the samples.

Wells with low recharge rates may require the use of special pumps capable of attaining very low pumping rates (e.g., bladder, peristaltic), and/or the use of dedicated equipment. For new monitoring wells, or wells where the following situation has not occurred before, if the recovery rate to the well is less than 50 mL/min., or the well is being essentially dewatered during purging, the well should be sampled as soon as the water level has recovered sufficiently to collect the volume needed for all anticipated samples. The project manager or field team leader will need to make the decision when samples should be collected, how the sample is to be collected, and the reasons recorded on the purge form or in the field logbook. A water level measurement needs to be performed and recorded before samples are collected. If the project manager decides to collect the samples using the pump, it is best during this recovery period that the pump intake tubing not be removed, since this will aggravate any turbidity problems. Samples in this specific situation may be collected without stabilization of indicator field parameters. Note that field conditions and efforts to overcome problematic situations must be recorded in order to support field decisions to deviate from normal procedures described in this SOP. If this type of problematic situation persists in a well, then water sample collection should be changed to a passive or no-purge method, if consistent with the site's DQOs, or have a new well installed.

E. Monitor Indicator Field Parameters

After the water level has stabilized, connect the "T" connector with a valve and the flow-through-cell to monitor the indicator field parameters. If excessive turbidity is anticipated or encountered with the pump startup, the well may be purged for a while without connecting up the flow-through-cell, in order to minimize particulate buildup in the cell (This is a judgment call made by the sampler). Water level drawdown measurements should be made as usual. If possible, the pump may be installed the day before purging to allow particulates that were disturbed during pump insertion to settle.

During well purging, monitor indicator field parameters (turbidity, temperature, specific conductance, pH, ORP, DO) at a frequency of five minute intervals or greater. The pump's flow rate must be able to "turn over" at least one flow-through-cell volume between measurements (for a 250 mL flow-through-cell with a flow rate of 50 mLs/min., the monitoring frequency would be every five minutes; for a 500 mL flow-through-cell it would be every ten minutes). If the cell volume cannot be replaced in the five minute interval, then the time between measurements must be increased accordingly. Note: during the early phase of purging emphasis should be put on minimizing and stabilizing pumping stress, and recording those adjustments followed by stabilization of indicator parameters. Purging is considered complete and sampling may begin when all the above indicator field parameters have stabilized. Stabilization is considered to be achieved when three consecutive readings are within the following limits:

Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

All measurements, except turbidity, must be obtained using a flow-through-cell. Samples for turbidity measurements are obtained before water enters the flow-through-cell. Transparent flow-through-cells are preferred, because they allow field personnel to watch for particulate build-up within the cell. This build-up may affect indicator field parameter values measured within the cell. If the cell needs to be cleaned during purging operations, continue pumping and disconnect cell for cleaning, then reconnect after cleaning and continue monitoring activities. Record start and stop times and give a brief description of cleaning activities.

The flow-through-cell must be designed in a way that prevents gas bubble entrapment in the cell. Placing the flow-through-cell at a 45 degree angle with the port facing upward can help remove bubbles from the flow-through-cell (see Appendix B Low-Flow Setup Diagram). All during the measurement process, the flow-through-cell must remain free of any gas bubbles. Otherwise, the monitoring probes may act erratically. When the pump is turned off or cycling on/off (when using a bladder pump), water in the cell must not drain out. Monitoring probes must remain submerged in water at all times.

F. Collect Water Samples

When samples are collected for laboratory analyses, the pump's tubing is disconnected from the "T" connector with a valve and the flow-through-cell. The samples are collected directly from the pump's tubing. Samples must not be collected from the flow-through-cell or from the "T" connector with a valve.

VOC samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

If the pump's flow rate is too high to collect the VOC/dissolved gases samples, collect the other samples first. Lower the pump's flow rate to a reasonable rate and collect the VOC/dissolved gases samples and record the new flow rate.

During purging and sampling, the centrifugal/peristaltic pump tubing must remain filled with water to avoid aeration of the groundwater. It is recommended that 1/4 inch or 3/8 inch (inside diameter) tubing be used to help insure that the sample tubing remains water filled. If the pump tubing is not completely filled to the sampling point, use the following procedure to collect samples: collect non-VOC/dissolved gases samples first, then increase flow rate slightly until the water completely fills the tubing, collect the VOC/dissolved gases samples, and record new drawdown depth and flow rate.

For bladder pumps that will be used to collect VOC or dissolved gas samples, it is recommended that the pump be set to deliver long pulses of water so that one pulse will fill a 40 mL VOC vial.

Use pre-preserved sample containers or add preservative, as required by analytical methods, to the samples immediately after they are collected. Check the analytical methods (e.g. EPA SW-846, 40 CFR 136, water supply, etc.) for additional information on preservation.

If determination of filtered metal concentrations is a sampling objective, collect filtered water samples using the same low flow procedures. The use of an in-line filter (transparent housing preferred) is required, and the filter size (0.45 μm is commonly used) should be based on the sampling objective. Pre-rinse the filter with groundwater prior to sample collection. Make sure the filter is free of air bubbles before samples are collected. Preserve the filtered water sample immediately. Note: filtered water samples are not an acceptable substitute for unfiltered samples when the monitoring objective is to obtain chemical concentrations of total mobile contaminants in groundwater for human health or ecological risk calculations.

Label each sample as collected. Samples requiring cooling will be placed into a cooler with ice or refrigerant for delivery to the laboratory. Metal samples after acidification to a pH less than 2 do not need to be cooled.

G. Post Sampling Activities

If a recording pressure transducer is used to track drawdown, re-measure water level with tape.

After collection of samples, the pump tubing may be dedicated to the well for re-sampling (by hanging the tubing inside the well), decontaminated, or properly discarded.

Before securing the well, measure and record the well depth (to 0.1 ft.), if not measured the day before purging began. Note: measurement of total well depth annually is usually sufficient after the initial low stress sampling event. However, a greater frequency may be needed if the well has a "silting" problem or if confirmation of well identity is needed.

Secure the well.

DECONTAMINATION

Decontaminate sampling equipment prior to use in the first well and then following sampling of each well. Pumps should not be removed between purging and sampling operations. The pump, tubing, support cable and electrical wires which were in contact with the well should be decontaminated by one of the procedures listed below.

The use of dedicated pumps and tubing will reduce the amount of time spent on decontamination of the equipment. If dedicated pumps and tubing are used, only the initial sampling event will require decontamination of the pump and tubing.

Note if the previous equipment blank data showed that contaminant(s) were present after using the below procedure or the one described in the SAP/QAPP, a more vigorous procedure may be needed.

Procedure 1

Decontaminating solutions can be pumped from either buckets or short PVC casing sections through the pump and tubing. The pump may be disassembled and flushed with the decontaminating solutions. It is recommended that detergent and alcohol be used sparingly in the decontamination process and water flushing steps be extended to ensure that any sediment trapped in the pump is removed. The pump exterior and electrical wires must be rinsed with the decontaminating solutions, as well. The procedure is as follows:

Flush the equipment/pump with potable water.

Flush with non-phosphate detergent solution. If the solution is recycled, the solution must be changed periodically.

Flush with potable or distilled/deionized water to remove all of the detergent solution. If the water is recycled, the water must be changed periodically.

Optional - flush with isopropyl alcohol (pesticide grade; must be free of ketones {e.g., acetone}) or with methanol. This step may be required if the well is highly contaminated or if the equipment blank data from the previous sampling event show that the level of contaminants is significant.

Flush with distilled/deionized water. This step must remove all traces of alcohol (if used) from the equipment. The final water rinse must not be recycled.

Procedure 2

Steam clean the outside of the submersible pump.

Pump hot potable water from the steam cleaner through the inside of the pump. This can be accomplished by placing the pump inside a three or four inch diameter PVC pipe with end cap. Hot water from the steam cleaner jet will be directed inside the PVC pipe and the pump exterior will be cleaned. The hot water from the steam cleaner will then be pumped from the PVC pipe through the pump and collected into another container. Note: additives or solutions should not be added to the steam cleaner.

Pump non-phosphate detergent solution through the inside of the pump. If the solution is recycled, the solution must be changed periodically.

Pump potable water through the inside of the pump to remove all of the detergent solution. If the solution is recycled, the solution must be changed periodically.

Pump distilled/deionized water through the pump. The final water rinse must not be recycled.

FIELD QUALITY CONTROL

Quality control samples are required to verify that the sample collection and handling process has not compromised the quality of the groundwater samples. All field quality control samples must be prepared the same as regular investigation samples with regard to sample volume, containers, and preservation. Quality control samples include field duplicates, equipment blanks, matrix spike/matrix spike duplicates, trip blanks (VOCs), and temperature blanks.

FIELD LOGBOOK

A field log shall be kept to document all groundwater field monitoring activities (see Appendix C, example table), and record the following for each well:

Site name, municipality, state.

Well identifier, latitude-longitude or state grid coordinates.

Measuring point description (e.g., north side of PVC pipe).

Well depth, and measurement technique.

Well screen length.

Pump depth.

Static water level depth, date, time and measurement technique.

Presence and thickness of immiscible liquid (NAPL) layers and detection method.

Pumping rate, drawdown, indicator parameters values, calculated or measured total volume pumped, and clock time of each set of measurements.

Type of tubing used and its length.

Type of pump used.

Clock time of start and end of purging and sampling activity.

Types of sample bottles used and sample identification numbers.

Preservatives used.

Parameters requested for analyses.

Field observations during sampling event.

Name of sample collector(s).

Weather conditions, including approximate ambient air temperature.

QA/QC data for field instruments.

Any problems encountered should be highlighted.

Description of all sampling/monitoring equipment used, including trade names, model number, instrument identification number, diameters, material composition, etc.

DATA REPORT

Data reports are to include laboratory analytical results, QA/QC information, field indicator parameters measured during purging, field instrument calibration information, and whatever other field logbook information is needed to allow for a full evaluation of data usability.

Note: the use of trade, product, or firm names in this sampling procedure is for descriptive purposes only and does not constitute endorsement by the U.S. EPA.

REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, *DNAPL Site Evaluation*; C.K. Smoley (CRC Press), Boca Raton, Florida.

Robert W. Puls and Michael J. Barcelona, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, April 1996 (EPA/540/S-95/504).

U.S. Environmental Protection Agency, 1992, *RCRA Ground-Water Monitoring: Draft Technical Guidance*; Washington, DC (EPA/530-R-93-001).

U.S. Environmental Protection Agency, 1987, *A Compendium of Superfund Field Operations Methods*; Washington, DC (EPA/540/P-87/001).

U.S Environmental Protection Agency, Region 1, *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* January 19, 2010 or latest version.

U.S Environmental Protection Agency, EPA SW-846.

U.S Environmental Protection Agency, 40 CFR 136.

U.S Environmental Protection Agency, 40 CFR 141.

Vroblesky, Don A., Clifton C. Casey, and Mark A. Lowery, Summer 2007, Influence of Dissolved Oxygen Convection on Well Sampling, *Ground Water Monitoring & Remediation* 27, no. 3: 49-58.

APPENDIX A
PERISTALTIC PUMPS

Before selecting a peristaltic pump to collect groundwater samples for VOCs and/or dissolved gases (e.g., methane, carbon dioxide, etc.) consideration should be given to the following:

- The decision of whether or not to use a peristaltic pump is dependent on the intended use of the data.
- If the additional sampling error that may be introduced by this device is NOT of concern for the VOC/dissolved gases data's intended use, then this device may be acceptable.
- If minor differences in the groundwater concentrations could effect the decision, such as to continue or terminate groundwater cleanup or whether the cleanup goals have been reached, then this device should NOT be used for VOC/dissolved gases sampling. In these cases, centrifugal or bladder pumps are a better choice for more accurate results.

EPA and USGS have documented their concerns with the use of the peristaltic pumps to collect water sample in the below documents.

- "Suction Pumps are not recommended because they may cause degassing, pH modification, and loss of volatile compounds" *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001, December 1987.
- "The agency does not recommend the use of peristaltic pumps to sample ground water particularly for volatile organic analytes" *RCRA Ground-Water Monitoring Draft Technical Guidance*, EPA Office of Solid Waste, November 1992.
- "The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and volatiles loss", *Low-flow (Minimal drawdown) Ground-Water Sampling Procedures*, by Robert Puls & Michael Barcelona, April 1996, EPA/540/S-95/504.
- "Suction-lift pumps, such as peristaltic pumps, can operate at a very low pumping rate; however, using negative pressure to lift the sample can result in the loss of volatile analytes", USGS Book 9 Techniques of Water-Resources Investigation, Chapter A4. (Version 2.0, 9/2006).

APPENDIX B

SUMMARY OF SAMPLING INSTRUCTIONS

These instructions are for using an adjustable rate, submersible pump or a peristaltic pump with the pump's intake placed at the midpoint of a 10 foot or less well screen or an open interval. The water level in the monitoring well is above the top of the well screen or open interval, the ambient temperature is above 32°F, and the equipment is not dedicated. Field instruments are already calibrated. The equipment is setup according to the diagram at the end of these instructions.

1. Review well installation information. Record well depth, length of screen or open interval, and depth to top of the well screen. Determine the pump's intake depth (e.g., mid-point of screen/open interval).

2. On the day of sampling, check security of the well casing, perform any safety checks needed for the site, lay out a sheet of polyethylene around the well (if necessary), and setup the equipment. If necessary a canopy or an equivalent item can be setup to shade the pump's tubing and flow-through-cell from the sun light to prevent the sun light from heating the groundwater.

3. Check well casing for a reference mark. If missing, make a reference mark. Measure the water level (initial) to 0.01 ft. and record this information.

4. Install the pump's intake to the appropriate depth (e.g., midpoint) of the well screen or open interval. Do not turn-on the pump at this time.

5. Measure water level and record this information.

6. Turn-on the pump and discharge the groundwater into a graduated waste bucket. Slowly increase the flow rate until the water level starts to drop. Reduce the flow rate slightly so the water level stabilizes. Record the pump's settings. Calculate the flow rate using a graduated container and a stop watch. Record the flow rate. Do not let the water level drop below the top of the well screen.

If the groundwater is highly turbid or colored, continue to discharge the water into the bucket until the water clears (visual observation); this usually takes a few minutes. The turbid or colored water is usually from the well being disturbed during the pump installation. If the water does not clear, then you need to make a choice whether to continue purging the well (hoping that it will clear after a reasonable time) or continue to

the next step. Note, it is sometimes helpful to install the pump the day before the sampling event so that the disturbed materials in the well can settle out.

If the water level drops to the top of the well screen during the purging of the well, stop purging the well, and do the following:

> Wait for the well to recharge to a sufficient volume so samples can be collected. This may take awhile (pump maybe removed from well, if turbidity is not a problem). The project manager will need to make the decision when samples should be collected and the reasons recorded in the site's log book. A water level measurement needs to be performed and recorded before samples are collected. When samples are being collected, the water level must not drop below the top of the screen or open interval. Collect the samples from the pump's tubing. Always collect the VOCs and dissolved gases samples first. Normally, the samples requiring a small volume are collected before the large volume samples are collected just in case there is not sufficient water in the well to fill all the sample containers. All samples must be collected, preserved, and stored according to the analytical method. Remove the pump from the well and decontaminate the sampling equipment.

If the water level has dropped 0.3 feet or less from the initial water level (water level measure before the pump was installed); proceed to Step 7. If the water level has dropped more than 0.3 feet, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are be collected.

7. Attach the pump's tubing to the "T" connector with a valve (or a three-way stop cock). The pump's tubing from the well casing to the "T" connector must be as short as possible to prevent the groundwater in the tubing from heating up from the sun light or from the ambient air. Attach a short piece of tubing to the other end of the end of the "T" connector to serve as a sampling port for the turbidity samples. Attach the remaining end of the "T" connector to a short piece of tubing and connect the tubing to the flow-through-cell bottom port. To the top port, attach a small piece of tubing to direct the water into a calibrated waste bucket. Fill the cell with the groundwater and remove all gas bubbles from the cell. Position the flow-through-cell in such a way that if gas bubbles enter the cell they can easily exit the cell. If the ports are on the same side of the cell and the cell is cylindrical shape, the cell can be placed at a 45-degree angle with the ports facing upwards; this position should keep any gas bubbles entering the cell away from the monitoring probes and allow the gas bubbles to exit the cell easily (see Low-Flow Setup Diagram). Note,

make sure there are no gas bubbles caught in the probes' protective guard; you may need to shake the cell to remove these bubbles.

8. Turn-on the monitoring probes and turbidity meter.

9. Record the temperature, pH, dissolved oxygen, specific conductance, and oxidation/reduction potential measurements. Open the valve on the "T" connector to collect a sample for the turbidity measurement, close the valve, do the measurement, and record this measurement. Calculate the pump's flow rate from the water exiting the flow-through-cell using a graduated container and a stop watch, and record the measurement. Measure and record the water level. Check flow-through-cell for gas bubbles and sediment; if present, remove them.

10. Repeat Step 9 every 5 minutes or as appropriate until monitoring parameters stabilized. Note at least one flow-through-cell volume must be exchanged between readings. If not, the time interval between readings will need to be increased. Stabilization is achieved when three consecutive measurements are within the following limits:

Turbidity (10% for values greater than 5 NTUs; if three Turbidity values are less than 5 NTUs, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

If these stabilization requirements do not stabilize in a reasonable time, the probes may have been coated from the materials in the groundwater, from a buildup of sediment in the flow-through-cell, or a gas bubble is lodged in the probe. The cell and the probes will need to be cleaned. Turn-off the probes (not the pump), disconnect the cell from the "T" connector and continue to purge the well. Disassemble the cell, remove the sediment, and clean the probes according to the manufacturer's instructions. Reassemble the cell and connect the cell to the "T" connector. Remove all gas bubbles from the cell, turn-on the probes, and continue the measurements. Record that the time the cell was cleaned.

11. When it is time to collect the groundwater samples, turn-off the monitoring probes, and disconnect the pump's tubing from the "T" connector. If you are using a centrifugal or peristaltic pump check the pump's tubing to determine if the tubing is completely filled with water (no air space).

All samples must be collected and preserved according to the analytical method. VOCs and dissolved gases samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

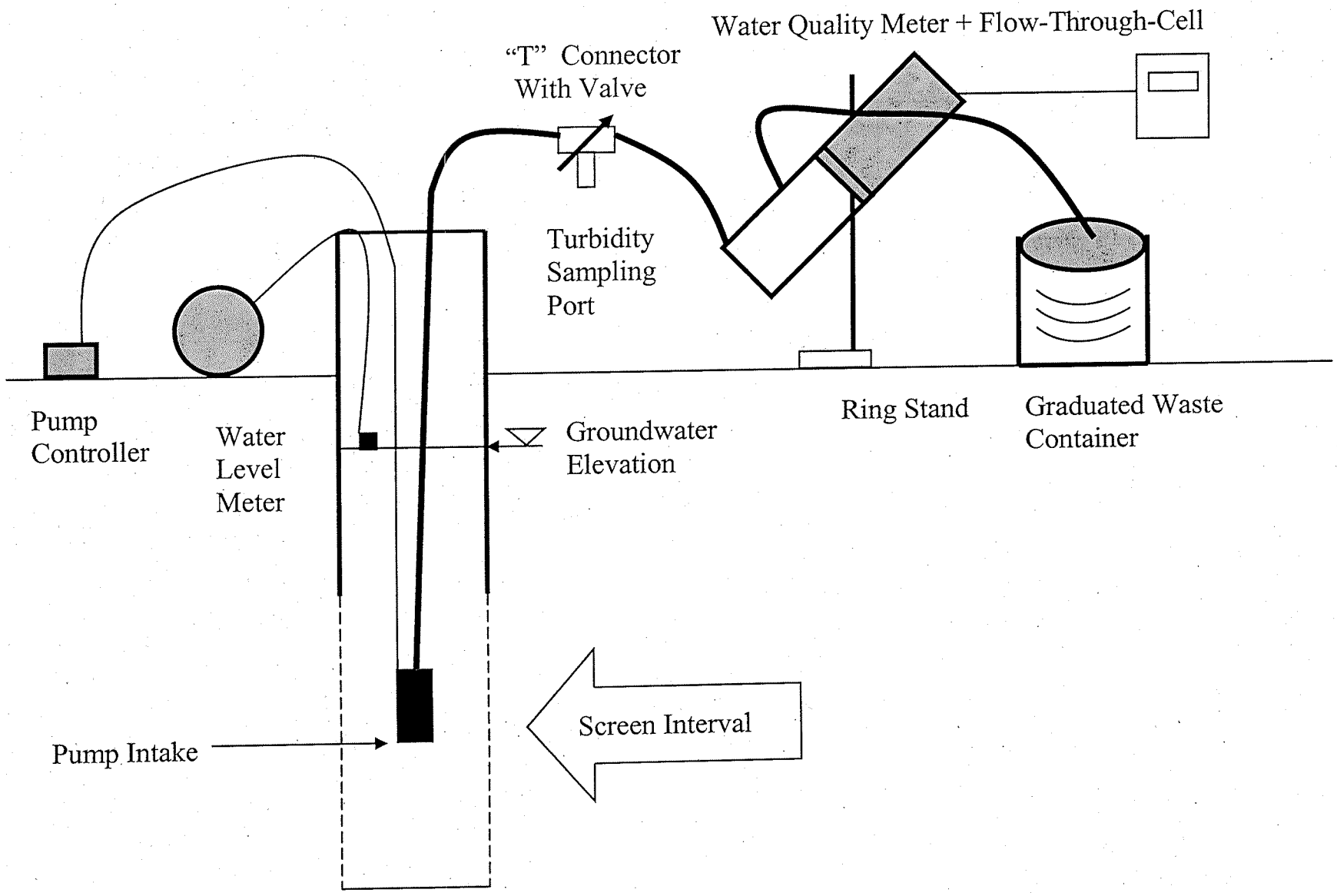
If the pump's tubing is not completely filled with water and the samples are being collected for VOCs and/or dissolved gases analyses using a centrifugal or peristaltic pump, do the following:

> All samples must be collected and preserved according to the analytical method. The VOCs and the dissolved gases (e.g., methane, ethane, ethene, and carbon dioxide) samples are collected last. When it becomes time to collect these samples increase the pump's flow rate until the tubing is completely filled. Collect the samples and record the new flow rate.

12. Store the samples according to the analytical method.

13. Record the total purged volume (graduated waste bucket). Remove the pump from the well and decontaminate the sampling equipment.

Low-Flow Setup Diagram



APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)_____
Well Number_____ Date_____
Field Personnel_____
Sampling Organization_____
Identify MP_____

Depth to _____/_____ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)_____
Purging Device; (pump type)_____
Total Volume Purged _____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25 °C.
3. Oxidation reduction potential (ORP)

Appendix D

Low Flow Sampling Procedures

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I

LOW STRESS (low flow) PURGING AND SAMPLING PROCEDURE FOR THE COLLECTION OF GROUNDWATER SAMPLES FROM MONITORING WELLS

Quality Assurance Unit
U.S. Environmental Protection Agency – Region 1
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Prepared by: Charles Porfert 1/19/10
(Charles Porfert, Quality Assurance Unit) Date

Approved by: Gerard Sotolongo 1-19-10
(Gerard Sotolongo, Quality Assurance Unit) Date

Revision Page

Date	Rev #	Summary of changes	Sections
7/30/96	2	Finalized	
01/19/10	3	Updated	All sections

TABLE OF CONTENTS

USE OF TERMS

Equipment blank: The equipment blank shall include the pump and the pump's tubing. If tubing is dedicated to the well, the equipment blank needs only to include the pump in subsequent sampling rounds. If the pump and tubing are dedicated to the well, the equipment blank is collected prior to its placement in the well. If the pump and tubing will be used to sample multiple wells, the equipment blank is normally collected after sampling from contaminated wells and not after background wells.

Field duplicates: Field duplicates are collected to determine precision of the sampling procedure. For this procedure, collect duplicate for each analyte group in consecutive order (VOC original, VOC duplicate, SVOC original, SVOC duplicate, etc.).

Indicator field parameters: This SOP uses field measurements of turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential (ORP) as indicators of when purging operations are sufficient and sample collection may begin.

Matrix Spike/Matrix Spike Duplicates: Used by the laboratory in its quality assurance program. Consult the laboratory for the sample volume to be collected.

Poteniometric Surface: The level to which water rises in a tightly cased well constructed in a confined aquifer. In an unconfined aquifer, the potentiometric surface is the water table.

QAPP: Quality Assurance Project Plan

SAP: Sampling and Analysis Plan

SOP: Standard operating procedure

Stabilization: A condition that is achieved when all indicator field parameter measurements are sufficiently stable (as described in the "Monitoring Indicator Field Parameters" section) to allow sample collection to begin.

Temperature blank: A temperature blank is added to each sample cooler. The blank is measured upon receipt at the laboratory to assess whether the samples were properly cooled during transit.

Trip blank (VOCs): Trip blank is a sample of analyte-free water taken to the sampling site and returned to the laboratory. The trip blanks (one pair) are added to each sample cooler that contains VOC samples.

SCOPE & APPLICATION

The goal of this groundwater sampling procedure is to collect water samples that reflect the total mobile organic and inorganic loads (dissolved and colloidal sized fractions) transported through the subsurface under ambient flow conditions, with minimal physical and chemical alterations from sampling operations. This standard operating procedure (SOP) for collecting groundwater samples will help ensure that the project's data quality objectives (DQOs) are met under certain low-flow conditions.

The SOP emphasizes the need to minimize hydraulic stress at the well-aquifer interface by maintaining low water-level drawdowns, and by using low pumping rates during purging and sampling operations. Indicator field parameters (e.g., dissolved oxygen, pH, etc.) are monitored during purging in order to determine when sample collection may begin. Samples properly collected using this SOP are suitable for analysis of groundwater contaminants (volatile and semi-volatile organic analytes, dissolved gases, pesticides, PCBs, metals and other inorganics), or naturally occurring analytes. This SOP is based on Puls, and Barcelona (1996).

This procedure is designed for monitoring wells with an inside diameter (1.5-inches or greater) that can accommodate a positive lift pump with a screen length or open interval ten feet or less and with a water level above the top of the screen or open interval (Hereafter, the "screen or open interval" will be referred to only as "screen interval"). This SOP is not applicable to other well-sampling conditions.

While the use of dedicated sampling equipment is not mandatory, dedicated pumps and tubing can reduce sampling costs significantly by streamlining sampling activities and thereby reducing the overall field costs.

The goal of this procedure is to emphasize the need for consistency in deploying and operating equipment while purging and sampling monitoring wells during each sampling event. This will help to minimize sampling variability.

This procedure describes a general framework for groundwater sampling. Other site specific information (hydrogeological context, conceptual site model (CSM), DQOs, etc.) coupled with systematic planning must be added to the procedure in order to develop an appropriate site specific SAP/QAPP. In addition, the site specific SAP/QAPP must identify the specific equipment that will be used to collect the groundwater samples.

This procedure does not address the collection of water or free product samples from wells containing free phase LNAPLs and/or DNAPLs (light or dense non-aqueous phase

liquids). For this type of situation, the reader may wish to check: Cohen, and Mercer (1993) or other pertinent documents.

This SOP is to be used when collecting groundwater samples from monitoring wells at all Superfund, Federal Facility and RCRA sites in Region 1 under the conditions described herein. Request for modification of this SOP, in order to better address specific situations at individual wells, must include adequate technical justification for proposed changes. All changes and modifications must be approved and included in a revised SAP/QAPP before implementation in field.

BACKGROUND FOR IMPLEMENTATION

It is expected that the monitoring well screen has been properly located (both laterally and vertically) to intercept existing contaminant plume(s) or along flow paths of potential contaminant migration. Problems with inappropriate monitoring well placement or faulty/improper well installation cannot be overcome by even the best water sampling procedures. This SOP presumes that the analytes of interest are moving (or will potentially move) primarily through the more permeable zones intercepted by the screen interval.

Proper well construction, development, and operation and maintenance cannot be overemphasized. The use of installation techniques that are appropriate to the hydrogeologic setting of the site often prevent "problem well" situations from occurring. During well development, or redevelopment, tests should be conducted to determine the hydraulic characteristics of the monitoring well. The data can then be used to set the purging/sampling rate, and provide a baseline for evaluating changes in well performance and the potential need for well rehabilitation. Note: if this installation data or well history (construction and sampling) is not available or discoverable, for all wells to be sampled, efforts to build a sampling history should commence with the next sampling event.

The pump intake should be located within the screen interval and at a depth that will remain under water at all times. It is recommended that the intake depth and pumping rate remain the same for all sampling events. The mid-point or the lowest historical midpoint of the saturated screen length is often used as the location of the pump intake. For new wells, or for wells without pump intake depth information, the site's SAP/QAPP must provide clear reasons and instructions on how the pump intake depth(s) will be selected, and reason(s) for the depth(s) selected. If the depths to top and bottom of the well screen are not known, the SAP/QAPP will need to describe how the sampling depth will be determined and how the data can be used.

Stabilization of indicator field parameters is used to indicate that conditions are suitable for sampling to begin. Achievement of turbidity levels of less than 5 NTU, and stable drawdowns of less than 0.3 feet, while desirable, are not mandatory. Sample collection

may still take place provided the indicator field parameter criteria in this procedure are met. If after 2 hours of purging indicator field parameters have not stabilized, one of three optional courses of action may be taken: a) continue purging until stabilization is achieved, b) discontinue purging, do not collect any samples, and record in log book that stabilization could not be achieved (documentation must describe attempts to achieve stabilization), c) discontinue purging, collect samples and provide full explanation of attempts to achieve stabilization (note: there is a risk that the analytical data obtained, especially metals and strongly hydrophobic organic analytes, may reflect a sampling bias and therefore, the data may not meet the data quality objectives of the sampling event).

It is recommended that low-flow sampling be conducted when the air temperature is above 32°F (0°C). If the procedure is used below 32°F, special precautions will need to be taken to prevent the groundwater from freezing in the equipment. Because sampling during freezing temperatures may adversely impact the data quality objectives, the need for water sample collection during months when these conditions are likely to occur should be evaluated during site planning and special sampling measures may need to be developed. Ice formation in the flow-through-cell will cause the monitoring probes to act erratically. A transparent flow-through-cell needs to be used to observe if ice is forming in the cell. If ice starts to form on the other pieces of the sampling equipment, additional problems may occur.

HEALTH & SAFETY

When working on-site, comply with all applicable OSHA requirements and the site's health/safety procedures. All proper personal protection clothing and equipment are to be worn. Some samples may contain biological and chemical hazards. These samples should be handled with suitable protection to skin, eyes, etc.

CAUTIONS

The following cautions need to be considered when planning to collect groundwater samples when the below conditions occur.

If the groundwater degasses during purging of the monitoring well, dissolved gases and VOCs will be lost. When this happens, the groundwater data for dissolved gases (e.g., methane, ethene, ethane, dissolved oxygen, etc.) and VOCs will need to be qualified. Some conditions that can promote degassing are the use of a vacuum pump (e.g., peristaltic pumps), changes in aperture along the sampling tubing, and squeezing/pinching the pump's tubing which results in a pressure change.

When collecting the samples for dissolved gases and VOCs analyses, avoid aerating the groundwater in the pump's tubing. This can cause loss of the dissolved gases and VOCs in

the groundwater. Having the pump's tubing completely filled prior to sampling will avoid this problem when using a centrifugal pump or peristaltic pump.

Direct sun light and hot ambient air temperatures may cause the groundwater in the tubing and flow-through-cell to heat up. This may cause the groundwater to degas which will result in loss of VOCs and dissolved gases. When sampling under these conditions, the sampler will need to shade the equipment from the sunlight (e.g., umbrella, tent, etc.). If possible, sampling on hot days, or during the hottest time of the day, should be avoided. The tubing exiting the monitoring well should be kept as short as possible to avoid the sun light or ambient air from heating up the groundwater.

Thermal currents in the monitoring well may cause vertical mixing of water in the well bore. When the air temperature is colder than the groundwater temperature, it can cool the top of the water column. Colder water which is denser than warm water sinks to the bottom of the well and the warmer water at the bottom of the well rises, setting up a convention cell. "During low-flow sampling, the pumped water may be a mixture of convecting water from within the well casing and aquifer water moving inward through the screen. This mixing of water during low-flow sampling can substantially increase equilibration times, can cause false stabilization of indicator parameters, can give false indication of redox state, and can provide biological data that are not representative of the aquifer conditions" (Vroblesky 2007).

Failure to calibrate or perform proper maintenance on the sampling equipment and measurement instruments (e.g., dissolved oxygen meter, etc.) can result in faulty data being collected.

Interferences may result from using contaminated equipment, cleaning materials, sample containers, or uncontrolled ambient/surrounding air conditions (e.g., truck/vehicle exhaust nearby).

Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment and/or proper planning to avoid ambient air interferences. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

Clean and decontaminate all sampling equipment prior to use. All sampling equipment needs to be routinely checked to be free from contaminants and equipment blanks collected to ensure that the equipment is free of contaminants. Check the previous equipment blank data for the site (if they exist) to determine if the previous cleaning procedure removed the contaminants. If contaminants were detected and they are a concern, then a more vigorous cleaning procedure will be needed.

PERSONNEL QUALIFICATIONS

All field samplers working at sites containing hazardous waste must meet the requirements of the OSHA regulations. OSHA regulations may require the sampler to take the 40 hour OSHA health and safety training course and a refresher course prior to engaging in any field activities, depending upon the site and field conditions.

The field samplers must be trained prior to the use of the sampling equipment, field instruments, and procedures. Training is to be conducted by an experienced sampler before initiating any sampling procedure.

The entire sampling team needs to read, and be familiar with, the site Health and Safety Plan, all relevant SOPs, and SAP/QAPP (and the most recent amendments) before going onsite for the sampling event. It is recommended that the field sampling leader attest to the understanding of these site documents and that it is recorded.

EQUIPMENT AND SUPPLIES

A. Informational materials for sampling event

A copy of the current Health and Safety Plan, SAP/QAPP, monitoring well construction data, location map(s), field data from last sampling event, manuals for sampling, and the monitoring instruments' operation, maintenance, and calibration manuals should be brought to the site.

B. Well keys.

C. Extraction device

Adjustable rate, submersible pumps (e.g., centrifugal, bladder, etc.) which are constructed of stainless steel or Teflon are preferred. Note: if extraction devices constructed of other materials are to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

If bladder pumps are selected for the collection of VOCs and dissolved gases, the pump setting should be set so that one pulse will deliver a water volume that is sufficient to fill a 40 mL VOC vial. This is not mandatory, but is considered a "best practice". For the proper operation, the bladder pump will need a minimum amount of water above the pump; consult the manufacturer for the recommended submergence. The pump's recommended submergence value should be determined during the planning stage, since it may influence well construction and placement of dedicated pumps where water-level fluctuations are significant.

Adjustable rate, peristaltic pumps (suction) are to be used with caution when collecting samples for VOCs and dissolved gases (e.g., methane, carbon dioxide, etc.) analyses. Additional information on the use of peristaltic pumps can be found in Appendix A. If peristaltic pumps are used, the inside diameter of the rotor head tubing needs to match the inside diameter of the tubing installed in the monitoring well.

Inertial pumping devices (motor driven or manual) are not recommended. These devices frequently cause greater disturbance during purging and sampling, and are less easily controlled than submersible pumps (potentially increasing turbidity and sampling variability, etc.). This can lead to sampling results that are adversely affected by purging and sampling operations, and a higher degree of data variability.

D. Tubing

Teflon or Teflon-lined polyethylene tubing are preferred when sampling is to include VOCs, SVOCs, pesticides, PCBs and inorganics. Note: if tubing constructed of other materials is to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

PVC, polypropylene or polyethylene tubing may be used when collecting samples for metal and other inorganics analyses.

The use of 1/4 inch or 3/8 inch (inside diameter) tubing is recommended. This will help ensure that the tubing remains liquid filled when operating at very low pumping rates when using centrifugal and peristaltic pumps.

Silastic tubing should be used for the section around the rotor head of a peristaltic pump. It should be less than a foot in length. The inside diameter of the tubing used at the pump rotor head must be the same as the inside diameter of tubing placed in the well. A tubing connector is used to connect the pump rotor head tubing to the well tubing. Alternatively, the two pieces of tubing can be connected to each other by placing the one end of the tubing inside the end of the other tubing. The tubing must not be reused.

E. The water level measuring device

Electronic "tape", pressure transducer, water level sounder/level indicator, etc. should be capable of measuring to 0.01 foot accuracy. Recording pressure transducers, mounted above the pump, are especially helpful in tracking water levels during pumping operations, but their use must include check measurements with a water level "tape" at the start and end of each sampling event.

F. Flow measurement supplies

Graduated cylinder (size according to flow rate) and stopwatch usually will suffice.

Large graduated bucket used to record total water purged from the well.

G. Interface probe

To be used to check on the presence of free phase liquids (LNAPL, or DNAPL) before purging begins (as needed).

H. Power source (generator, nitrogen tank, battery, etc.)

When a gasoline generator is used, locate it downwind and at least 30 feet from the well so that the exhaust fumes do not contaminate samples.

I. Indicator field parameter monitoring instruments

Use of a multi-parameter instrument capable of measuring pH, oxidation/reduction potential (ORP), dissolved oxygen (DO), specific conductance, temperature, and coupled with a flow-through-cell is required when measuring all indicator field parameters, except turbidity. Turbidity is collected using a separate instrument. Record equipment/instrument identification (manufacturer, and model number).

Transparent, small volume flow-through-cells (e.g., 250 mLs or less) are preferred. This allows observation of air bubbles and sediment buildup in the cell, which can interfere with the operation of the monitoring instrument probes, to be easily detected. A small volume cell facilitates rapid turnover of water in the cell between measurements of the indicator field parameters.

It is recommended to use a flow-through-cell and monitoring probes from the same manufacturer and model to avoid incompatibility between the probes and flow-through-cell.

Turbidity samples are collected before the flow-through-cell. A "T" connector coupled with a valve is connected between the pump's tubing and flow-through-cell. When a turbidity measurement is required, the valve is opened to allow the groundwater to flow into a container. The valve is closed and the container sample is then placed in the turbidimeter.

Standards are necessary to perform field calibration of instruments. A minimum of two standards are needed to bracket the instrument measurement range for all parameters except ORP which use a Zobell solution as a standard. For dissolved oxygen, a wet sponge used for the 100% saturation and a zero dissolved oxygen solution are used for the calibration.

Barometer (used in the calibration of the Dissolved Oxygen probe) and the conversion formula to convert the barometric pressure into the units of measure used by the Dissolved Oxygen meter are needed.

J. Decontamination supplies

Includes (for example) non-phosphate detergent, distilled/deionized water, isopropyl alcohol, etc.

K. Record keeping supplies

Logbook(s), well purging forms, chain-of-custody forms, field instrument calibration forms, etc.

L. Sample bottles

M. Sample preservation supplies (as required by the analytical methods)

N. Sample tags or labels

O. PID or FID instrument

If appropriate, to detect VOCs for health and safety purposes, and provide qualitative field evaluations.

P. Miscellaneous Equipment

Equipment to keep the sampling apparatus shaded in the summer (e.g., umbrella) and from freezing in the winter. If the pump's tubing is allowed to heat up in the warm weather, the cold groundwater may degas as it is warmed in the tubing.

EQUIPMENT/INSTRUMENT CALIBRATION

Prior to the sampling event, perform maintenance checks on the equipment and instruments according to the manufacturer's manual and/or applicable SOP. This will ensure that the equipment/instruments are working properly before they are used in the field.

Prior to sampling, the monitoring instruments must be calibrated and the calibration documented. The instruments are calibrated using U.S Environmental Protection Agency Region 1 *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* January 19, 2010, or latest version or from one of the methods listed in 40CFR136, 40CFR141 and SW-846.

The instruments shall be calibrated at the beginning of each day. If the field measurement falls outside the calibration range, the instrument must be re-calibrated so that all measurements fall within the calibration range. At the end of each day, a calibration check is performed to verify that instruments remained in calibration throughout the day. This check is performed while the instrument is in measurement mode, not calibration mode. If the field instruments are being used to monitor the natural attenuation parameters, then a calibration check at mid-day is highly recommended to ensure that the instruments did not drift out of calibration. Note: during the day if the instrument reads zero or a negative number for dissolved oxygen, pH, specific conductance, or turbidity (negative value only), this indicates that the instrument drifted out of calibration or the instrument is malfunctioning. If this situation occurs the data from this instrument will need to be qualified or rejected.

PRELIMINARY SITE ACTIVITIES (as applicable)

Check the well for security (damage, evidence of tampering, missing lock, etc.) and record pertinent observations (include photograph as warranted).

If needed lay out sheet of clean polyethylene for monitoring and sampling equipment, unless equipment is elevated above the ground (e.g., on a table, etc.).

Remove well cap and if appropriate measure VOCs at the rim of the well with a PID or FID instrument and record reading in field logbook or on the well purge form.

If the well casing does not have an established reference point (usually a V-cut or indelible mark in the well casing), make one. Describe its location and record the date of the mark in the logbook (consider a photographic record as well). All water level measurements must be recorded relative to this reference point (and the altitude of this point should be determined using techniques that are appropriate to site's DQOs.

If water-table or potentiometric surface map(s) are to be constructed for the sampling event, perform synoptic water level measurement round (in the shortest possible time) before any purging and sampling activities begin. If possible, measure water level depth (to 0.01 ft.) and total well depth (to 0.1 ft.) the day before sampling begins, in order to allow for re-settlement of any particulates in the water column. This is especially important for those wells that have not been recently sampled because sediment buildup in the well may require the well to be redeveloped. If measurement of total well depth is not made the day before, it should be measured after sampling of the well is complete. All measurements must be taken from the established referenced point. Care should be taken to minimize water column disturbance.

Check newly constructed wells for the presence of LNAPLs or DNAPLs before the initial sampling round. If none are encountered, subsequent check measurements with an interface probe may not be necessary unless analytical data or field analysis signal a worsening situation. This SOP cannot be used in the presence of LNAPLs or DNAPLs. If NAPLs are present, the project team must decide upon an alternate sampling method. All project modifications must be approved and documented prior to implementation.

If available check intake depth and drawdown information from previous sampling event(s) for each well. Duplicate, to the extent practicable, the intake depth and extraction rate (use final pump dial setting information) from previous event(s). If changes are made in the intake depth or extraction rate(s) used during previous sampling event(s), for either portable or dedicated extraction devices, record new values, and explain reasons for the changes in the field logbook.

PURGING AND SAMPLING PROCEDURE

Purging and sampling wells in order of increasing chemical concentrations (known or anticipated) are preferred.

The use of dedicated pumps is recommended to minimize artificial mobilization and entrainment of particulates each time the well is sampled. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each

sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

A. Initial Water Level

Measure the water level in the well before installing the pump if a non-dedicated pump is being used. The initial water level is recorded on the purge form or in the field logbook.

B. Install Pump

Lower pump, safety cable, tubing and electrical lines slowly (to minimize disturbance) into the well to the appropriate depth (may not be the mid-point of the screen/open interval). The Sampling and Analysis Plan/Quality Assurance Project Plan should specify the sampling depth (used previously), or provide criteria for selection of intake depth for each new well. If possible keep the pump intake at least two feet above the bottom of the well, to minimize mobilization of particulates present in the bottom of the well.

Pump tubing lengths, above the top of well casing should be kept as short as possible to minimize heating the groundwater in the tubing by exposure to sun light and ambient air temperatures. Heating may cause the groundwater to degas, which is unacceptable for the collection of samples for VOC and dissolved gases analyses.

C. Measure Water Level

Before starting pump, measure water level. Install recording pressure transducer, if used to track drawdowns, to initialize starting condition.

D. Purge Well

From the time the pump starts purging and until the time the samples are collected, the purged water is discharged into a graduated bucket to determine the total volume of groundwater purged. This information is recorded on the purge form or in the field logbook.

Start the pump at low speed and slowly increase the speed until discharge occurs. Check water level. Check equipment for water leaks and if present fix or replace the affected equipment. Try to match pumping rate used during previous sampling event(s). Otherwise, adjust pump speed until there is little or no water level drawdown. If the minimal drawdown that can be achieved exceeds 0.3 feet, but remains stable, continue purging.

Monitor and record the water level and pumping rate every five minutes (or as appropriate) during purging. Record any pumping rate adjustments (both time and flow rate). Pumping rates should, as needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. Adjustments are best made in the first fifteen minutes of pumping in order to help minimize purging time. During pump start-up, drawdown may exceed the 0.3 feet target and then "recover" somewhat as pump flow adjustments are made. Purge volume calculations should utilize stabilized drawdown value, not the initial drawdown. If the initial water level is above the top of the screen do not allow the water level to fall into the well screen. The final purge volume must be greater than the stabilized drawdown volume plus the pump's tubing volume. If the drawdown has exceeded 0.3 feet and stabilizes, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.

Avoid the use of constriction devices on the tubing to decrease the flow rate because the constrictor will cause a pressure difference in the water column. This will cause the groundwater to degas and result in a loss of VOCs and dissolved gasses in the groundwater samples.

Note: the flow rate used to achieve a stable pumping level should remain constant while monitoring the indicator parameters for stabilization and while collecting the samples.

Wells with low recharge rates may require the use of special pumps capable of attaining very low pumping rates (e.g., bladder, peristaltic), and/or the use of dedicated equipment. For new monitoring wells, or wells where the following situation has not occurred before, if the recovery rate to the well is less than 50 mL/min., or the well is being essentially dewatered during purging, the well should be sampled as soon as the water level has recovered sufficiently to collect the volume needed for all anticipated samples. The project manager or field team leader will need to make the decision when samples should be collected, how the sample is to be collected, and the reasons recorded on the purge form or in the field logbook. A water level measurement needs to be performed and recorded before samples are collected. If the project manager decides to collect the samples using the pump, it is best during this recovery period that the pump intake tubing not be removed, since this will aggravate any turbidity problems. Samples in this specific situation may be collected without stabilization of indicator field parameters. Note that field conditions and efforts to overcome problematic situations must be recorded in order to support field decisions to deviate from normal procedures described in this SOP. If this type of problematic situation persists in a well, then water sample collection should be changed to a passive or no-purge method, if consistent with the site's DQOs, or have a new well installed.

E. Monitor Indicator Field Parameters

After the water level has stabilized, connect the "T" connector with a valve and the flow-through-cell to monitor the indicator field parameters. If excessive turbidity is anticipated or encountered with the pump startup, the well may be purged for a while without connecting up the flow-through-cell, in order to minimize particulate buildup in the cell (This is a judgment call made by the sampler). Water level drawdown measurements should be made as usual. If possible, the pump may be installed the day before purging to allow particulates that were disturbed during pump insertion to settle.

During well purging, monitor indicator field parameters (turbidity, temperature, specific conductance, pH, ORP, DO) at a frequency of five minute intervals or greater. The pump's flow rate must be able to "turn over" at least one flow-through-cell volume between measurements (for a 250 mL flow-through-cell with a flow rate of 50 mLs/min., the monitoring frequency would be every five minutes; for a 500 mL flow-through-cell it would be every ten minutes). If the cell volume cannot be replaced in the five minute interval, then the time between measurements must be increased accordingly. Note: during the early phase of purging emphasis should be put on minimizing and stabilizing pumping stress, and recording those adjustments followed by stabilization of indicator parameters. Purging is considered complete and sampling may begin when all the above indicator field parameters have stabilized. Stabilization is considered to be achieved when three consecutive readings are within the following limits:

Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

All measurements, except turbidity, must be obtained using a flow-through-cell. Samples for turbidity measurements are obtained before water enters the flow-through-cell. Transparent flow-through-cells are preferred, because they allow field personnel to watch for particulate build-up within the cell. This build-up may affect indicator field parameter values measured within the cell. If the cell needs to be cleaned during purging operations, continue pumping and disconnect cell for cleaning, then reconnect after cleaning and continue monitoring activities. Record start and stop times and give a brief description of cleaning activities.

The flow-through-cell must be designed in a way that prevents gas bubble entrapment in the cell. Placing the flow-through-cell at a 45 degree angle with the port facing upward can help remove bubbles from the flow-through-cell (see Appendix B Low-Flow Setup Diagram). All during the measurement process, the flow-through-cell must remain free of any gas bubbles. Otherwise, the monitoring probes may act erratically. When the pump is turned off or cycling on/off (when using a bladder pump), water in the cell must not drain out. Monitoring probes must remain submerged in water at all times.

F. Collect Water Samples

When samples are collected for laboratory analyses, the pump's tubing is disconnected from the "T" connector with a valve and the flow-through-cell. The samples are collected directly from the pump's tubing. Samples must not be collected from the flow-through-cell or from the "T" connector with a valve.

VOC samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

If the pump's flow rate is too high to collect the VOC/dissolved gases samples, collect the other samples first. Lower the pump's flow rate to a reasonable rate and collect the VOC/dissolved gases samples and record the new flow rate.

During purging and sampling, the centrifugal/peristaltic pump tubing must remain filled with water to avoid aeration of the groundwater. It is recommended that 1/4 inch or 3/8 inch (inside diameter) tubing be used to help insure that the sample tubing remains water filled. If the pump tubing is not completely filled to the sampling point, use the following procedure to collect samples: collect non-VOC/dissolved gases samples first, then increase flow rate slightly until the water completely fills the tubing, collect the VOC/dissolved gases samples, and record new drawdown depth and flow rate.

For bladder pumps that will be used to collect VOC or dissolved gas samples, it is recommended that the pump be set to deliver long pulses of water so that one pulse will fill a 40 mL VOC vial.

Use pre-preserved sample containers or add preservative, as required by analytical methods, to the samples immediately after they are collected. Check the analytical methods (e.g. EPA SW-846, 40 CFR 136, water supply, etc.) for additional information on preservation.

If determination of filtered metal concentrations is a sampling objective, collect filtered water samples using the same low flow procedures. The use of an in-line filter (transparent housing preferred) is required, and the filter size (0.45 μm is commonly used) should be based on the sampling objective. Pre-rinse the filter with groundwater prior to sample collection. Make sure the filter is free of air bubbles before samples are collected. Preserve the filtered water sample immediately. Note: filtered water samples are not an acceptable substitute for unfiltered samples when the monitoring objective is to obtain chemical concentrations of total mobile contaminants in groundwater for human health or ecological risk calculations.

Label each sample as collected. Samples requiring cooling will be placed into a cooler with ice or refrigerant for delivery to the laboratory. Metal samples after acidification to a pH less than 2 do not need to be cooled.

G. Post Sampling Activities

If a recording pressure transducer is used to track drawdown, re-measure water level with tape.

After collection of samples, the pump tubing may be dedicated to the well for re-sampling (by hanging the tubing inside the well), decontaminated, or properly discarded.

Before securing the well, measure and record the well depth (to 0.1 ft.), if not measured the day before purging began. Note: measurement of total well depth annually is usually sufficient after the initial low stress sampling event. However, a greater frequency may be needed if the well has a "silting" problem or if confirmation of well identity is needed.

Secure the well.

DECONTAMINATION

Decontaminate sampling equipment prior to use in the first well and then following sampling of each well. Pumps should not be removed between purging and sampling operations. The pump, tubing, support cable and electrical wires which were in contact with the well should be decontaminated by one of the procedures listed below.

The use of dedicated pumps and tubing will reduce the amount of time spent on decontamination of the equipment. If dedicated pumps and tubing are used, only the initial sampling event will require decontamination of the pump and tubing.

Note if the previous equipment blank data showed that contaminant(s) were present after using the below procedure or the one described in the SAP/QAPP, a more vigorous procedure may be needed.

Procedure 1

Decontaminating solutions can be pumped from either buckets or short PVC casing sections through the pump and tubing. The pump may be disassembled and flushed with the decontaminating solutions. It is recommended that detergent and alcohol be used sparingly in the decontamination process and water flushing steps be extended to ensure that any sediment trapped in the pump is removed. The pump exterior and electrical wires must be rinsed with the decontaminating solutions, as well. The procedure is as follows:

Flush the equipment/pump with potable water.

Flush with non-phosphate detergent solution. If the solution is recycled, the solution must be changed periodically.

Flush with potable or distilled/deionized water to remove all of the detergent solution. If the water is recycled, the water must be changed periodically.

Optional - flush with isopropyl alcohol (pesticide grade; must be free of ketones {e.g., acetone}) or with methanol. This step may be required if the well is highly contaminated or if the equipment blank data from the previous sampling event show that the level of contaminants is significant.

Flush with distilled/deionized water. This step must remove all traces of alcohol (if used) from the equipment. The final water rinse must not be recycled.

Procedure 2

Steam clean the outside of the submersible pump.

Pump hot potable water from the steam cleaner through the inside of the pump. This can be accomplished by placing the pump inside a three or four inch diameter PVC pipe with end cap. Hot water from the steam cleaner jet will be directed inside the PVC pipe and the pump exterior will be cleaned. The hot water from the steam cleaner will then be pumped from the PVC pipe through the pump and collected into another container. Note: additives or solutions should not be added to the steam cleaner.

Pump non-phosphate detergent solution through the inside of the pump. If the solution is recycled, the solution must be changed periodically.

Pump potable water through the inside of the pump to remove all of the detergent solution. If the solution is recycled, the solution must be changed periodically.

Pump distilled/deionized water through the pump. The final water rinse must not be recycled.

FIELD QUALITY CONTROL

Quality control samples are required to verify that the sample collection and handling process has not compromised the quality of the groundwater samples. All field quality control samples must be prepared the same as regular investigation samples with regard to sample volume, containers, and preservation. Quality control samples include field duplicates, equipment blanks, matrix spike/matrix spike duplicates, trip blanks (VOCs), and temperature blanks.

FIELD LOGBOOK

A field log shall be kept to document all groundwater field monitoring activities (see Appendix C, example table), and record the following for each well:

Site name, municipality, state.

Well identifier, latitude-longitude or state grid coordinates.

Measuring point description (e.g., north side of PVC pipe).

Well depth, and measurement technique.

Well screen length.

Pump depth.

Static water level depth, date, time and measurement technique.

Presence and thickness of immiscible liquid (NAPL) layers and detection method.

Pumping rate, drawdown, indicator parameters values, calculated or measured total volume pumped, and clock time of each set of measurements.

Type of tubing used and its length.

Type of pump used.

Clock time of start and end of purging and sampling activity.

Types of sample bottles used and sample identification numbers.

Preservatives used.

Parameters requested for analyses.

Field observations during sampling event.

Name of sample collector(s).

Weather conditions, including approximate ambient air temperature.

QA/QC data for field instruments.

Any problems encountered should be highlighted.

Description of all sampling/monitoring equipment used, including trade names, model number, instrument identification number, diameters, material composition, etc.

DATA REPORT

Data reports are to include laboratory analytical results, QA/QC information, field indicator parameters measured during purging, field instrument calibration information, and whatever other field logbook information is needed to allow for a full evaluation of data usability.

Note: the use of trade, product, or firm names in this sampling procedure is for descriptive purposes only and does not constitute endorsement by the U.S. EPA.

REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, *DNAPL Site Evaluation*; C.K. Smoley (CRC Press), Boca Raton, Florida.

Robert W. Puls and Michael J. Barcelona, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, April 1996 (EPA/540/S-95/504).

U.S. Environmental Protection Agency, 1992, *RCRA Ground-Water Monitoring: Draft Technical Guidance*; Washington, DC (EPA/530-R-93-001).

U.S. Environmental Protection Agency, 1987, *A Compendium of Superfund Field Operations Methods*; Washington, DC (EPA/540/P-87/001).

U.S Environmental Protection Agency, Region 1, *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* January 19, 2010 or latest version.

U.S Environmental Protection Agency, EPA SW-846.

U.S Environmental Protection Agency, 40 CFR 136.

U.S Environmental Protection Agency, 40 CFR 141.

Vroblesky, Don A., Clifton C. Casey, and Mark A. Lowery, Summer 2007, Influence of Dissolved Oxygen Convection on Well Sampling, *Ground Water Monitoring & Remediation* 27, no. 3: 49-58.

APPENDIX A
PERISTALTIC PUMPS

Before selecting a peristaltic pump to collect groundwater samples for VOCs and/or dissolved gases (e.g., methane, carbon dioxide, etc.) consideration should be given to the following:

- The decision of whether or not to use a peristaltic pump is dependent on the intended use of the data.
- If the additional sampling error that may be introduced by this device is NOT of concern for the VOC/dissolved gases data's intended use, then this device may be acceptable.
- If minor differences in the groundwater concentrations could effect the decision, such as to continue or terminate groundwater cleanup or whether the cleanup goals have been reached, then this device should NOT be used for VOC/dissolved gases sampling. In these cases, centrifugal or bladder pumps are a better choice for more accurate results.

EPA and USGS have documented their concerns with the use of the peristaltic pumps to collect water sample in the below documents.

- "Suction Pumps are not recommended because they may cause degassing, pH modification, and loss of volatile compounds" *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001, December 1987.
- "The agency does not recommend the use of peristaltic pumps to sample ground water particularly for volatile organic analytes" *RCRA Ground-Water Monitoring Draft Technical Guidance*, EPA Office of Solid Waste, November 1992.
- "The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and volatiles loss", *Low-flow (Minimal drawdown) Ground-Water Sampling Procedures*, by Robert Puls & Michael Barcelona, April 1996, EPA/540/S-95/504.
- "Suction-lift pumps, such as peristaltic pumps, can operate at a very low pumping rate; however, using negative pressure to lift the sample can result in the loss of volatile analytes", USGS Book 9 Techniques of Water-Resources Investigation, Chapter A4. (Version 2.0, 9/2006).

APPENDIX B

SUMMARY OF SAMPLING INSTRUCTIONS

These instructions are for using an adjustable rate, submersible pump or a peristaltic pump with the pump's intake placed at the midpoint of a 10 foot or less well screen or an open interval. The water level in the monitoring well is above the top of the well screen or open interval, the ambient temperature is above 32°F, and the equipment is not dedicated. Field instruments are already calibrated. The equipment is setup according to the diagram at the end of these instructions.

1. Review well installation information. Record well depth, length of screen or open interval, and depth to top of the well screen. Determine the pump's intake depth (e.g., mid-point of screen/open interval).

2. On the day of sampling, check security of the well casing, perform any safety checks needed for the site, lay out a sheet of polyethylene around the well (if necessary), and setup the equipment. If necessary a canopy or an equivalent item can be setup to shade the pump's tubing and flow-through-cell from the sun light to prevent the sun light from heating the groundwater.

3. Check well casing for a reference mark. If missing, make a reference mark. Measure the water level (initial) to 0.01 ft. and record this information.

4. Install the pump's intake to the appropriate depth (e.g., midpoint) of the well screen or open interval. Do not turn-on the pump at this time.

5. Measure water level and record this information.

6. Turn-on the pump and discharge the groundwater into a graduated waste bucket. Slowly increase the flow rate until the water level starts to drop. Reduce the flow rate slightly so the water level stabilizes. Record the pump's settings. Calculate the flow rate using a graduated container and a stop watch. Record the flow rate. Do not let the water level drop below the top of the well screen.

If the groundwater is highly turbid or colored, continue to discharge the water into the bucket until the water clears (visual observation); this usually takes a few minutes. The turbid or colored water is usually from the well being disturbed during the pump installation. If the water does not clear, then you need to make a choice whether to continue purging the well (hoping that it will clear after a reasonable time) or continue to

the next step. Note, it is sometimes helpful to install the pump the day before the sampling event so that the disturbed materials in the well can settle out.

If the water level drops to the top of the well screen during the purging of the well, stop purging the well, and do the following:

> Wait for the well to recharge to a sufficient volume so samples can be collected. This may take awhile (pump maybe removed from well, if turbidity is not a problem). The project manager will need to make the decision when samples should be collected and the reasons recorded in the site's log book. A water level measurement needs to be performed and recorded before samples are collected. When samples are being collected, the water level must not drop below the top of the screen or open interval. Collect the samples from the pump's tubing. Always collect the VOCs and dissolved gases samples first. Normally, the samples requiring a small volume are collected before the large volume samples are collected just in case there is not sufficient water in the well to fill all the sample containers. All samples must be collected, preserved, and stored according to the analytical method. Remove the pump from the well and decontaminate the sampling equipment.

If the water level has dropped 0.3 feet or less from the initial water level (water level measure before the pump was installed); proceed to Step 7. If the water level has dropped more than 0.3 feet, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are be collected.

7. Attach the pump's tubing to the "T" connector with a valve (or a three-way stop cock). The pump's tubing from the well casing to the "T" connector must be as short as possible to prevent the groundwater in the tubing from heating up from the sun light or from the ambient air. Attach a short piece of tubing to the other end of the end of the "T" connector to serve as a sampling port for the turbidity samples. Attach the remaining end of the "T" connector to a short piece of tubing and connect the tubing to the flow-through-cell bottom port. To the top port, attach a small piece of tubing to direct the water into a calibrated waste bucket. Fill the cell with the groundwater and remove all gas bubbles from the cell. Position the flow-through-cell in such a way that if gas bubbles enter the cell they can easily exit the cell. If the ports are on the same side of the cell and the cell is cylindrical shape, the cell can be placed at a 45-degree angle with the ports facing upwards; this position should keep any gas bubbles entering the cell away from the monitoring probes and allow the gas bubbles to exit the cell easily (see Low-Flow Setup Diagram). Note,

make sure there are no gas bubbles caught in the probes' protective guard; you may need to shake the cell to remove these bubbles.

8. Turn-on the monitoring probes and turbidity meter.

9. Record the temperature, pH, dissolved oxygen, specific conductance, and oxidation/reduction potential measurements. Open the valve on the "T" connector to collect a sample for the turbidity measurement, close the valve, do the measurement, and record this measurement. Calculate the pump's flow rate from the water exiting the flow-through-cell using a graduated container and a stop watch, and record the measurement. Measure and record the water level. Check flow-through-cell for gas bubbles and sediment; if present, remove them.

10. Repeat Step 9 every 5 minutes or as appropriate until monitoring parameters stabilized. Note at least one flow-through-cell volume must be exchanged between readings. If not, the time interval between readings will need to be increased. Stabilization is achieved when three consecutive measurements are within the following limits:

Turbidity (10% for values greater than 5 NTUs; if three Turbidity values are less than 5 NTUs, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

If these stabilization requirements do not stabilize in a reasonable time, the probes may have been coated from the materials in the groundwater, from a buildup of sediment in the flow-through-cell, or a gas bubble is lodged in the probe. The cell and the probes will need to be cleaned. Turn-off the probes (not the pump), disconnect the cell from the "T" connector and continue to purge the well. Disassemble the cell, remove the sediment, and clean the probes according to the manufacturer's instructions. Reassemble the cell and connect the cell to the "T" connector. Remove all gas bubbles from the cell, turn-on the probes, and continue the measurements. Record that the time the cell was cleaned.

11. When it is time to collect the groundwater samples, turn-off the monitoring probes, and disconnect the pump's tubing from the "T" connector. If you are using a centrifugal or peristaltic pump check the pump's tubing to determine if the tubing is completely filled with water (no air space).

All samples must be collected and preserved according to the analytical method. VOCs and dissolved gases samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

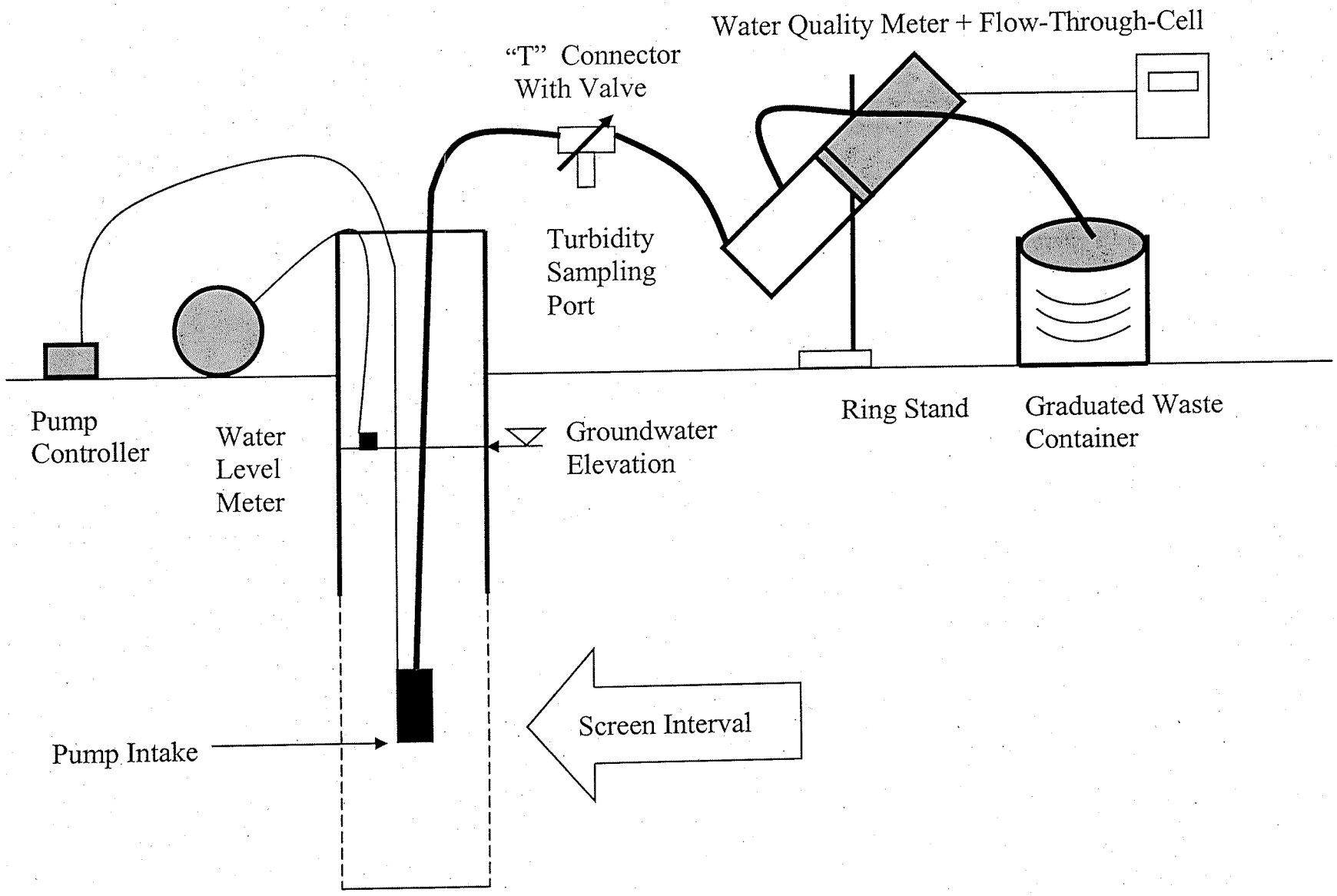
If the pump's tubing is not completely filled with water and the samples are being collected for VOCs and/or dissolved gases analyses using a centrifugal or peristaltic pump, do the following:

> All samples must be collected and preserved according to the analytical method. The VOCs and the dissolved gases (e.g., methane, ethane, ethene, and carbon dioxide) samples are collected last. When it becomes time to collect these samples increase the pump's flow rate until the tubing is completely filled. Collect the samples and record the new flow rate.

12. Store the samples according to the analytical method.

13. Record the total purged volume (graduated waste bucket). Remove the pump from the well and decontaminate the sampling equipment.

Low-Flow Setup Diagram



APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)_____
Well Number_____ Date_____
Field Personnel_____
Sampling Organization_____
Identify MP_____

Depth to _____/_____ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)_____
Purging Device; (pump type)_____
Total Volume Purged _____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25 °C.
3. Oxidation reduction potential (ORP)